

# Effect of a Community Health Worker Based Health Promotion Intervention on Uptake of Cervical Cancer Screening Services among Women of Reproductive Age in Kitui County, Kenya

Fridah Ndinda Muinde<sup>1\*</sup>, Japheth Mativo Nzioki<sup>1</sup> and Mohamed Karama Mahmoud<sup>2</sup>

- 1. Jomo Kenyatta University of Agriculture and Technology, P.O. Box, 62000-00200, Nairobi-Kenya.
- 2. Umma University, P.O Box 713-01100, Kajiado, Kenya.

\*Corresponding author. Fridah Ndinda Muinde, Email: fmuinde@gmail.com

## Summary

#### **INTRODUCTION**

Cervical cancer is a malignant neoplasm of the cervix uteri. It is the second most common cancer among women worldwide, with an estimated 528,000 new cases and 266,000 deaths among women each year. Cervical cancer is associated with a huge financial and social burden especially in the developing world. Diagnosing cervical cancer at an early stage and providing access to effective treatment is key to reducing its burden. In Kenya, cervical cancer screening is very low at 14%. The aim of this study was to assess the effect of a Community Health Worker (CHW) led health education intervention in promoting uptake of cervical cancer screening in Kitui County-Kenya.

#### **METHODS**

The study was carried out in Kitui County. This was a quasi-experiment with one pre-intervention and one post intervention survey conducted in both intervention and control sites. Kitui East and Mwingi West were intervention and control sites respectively. The intervention site received a Community Based Health Education (CBHE) intervention aimed at promoting awareness and screening of both breast and cervical cancer. A total sample size of 422 participants were identified in each survey based on Fisher et al (1998) formula. Purposive and simple random sampling methods were used in identifying study area and study participants respectively.

#### RESULTS

The CHW led Health education intervention increased the proportion of women who sought cervical cancer screening services by 29.5% over the 8 months of the intervention period.



The odds of seeking cervical cancer screening services were 10 times higher in the intervention site compared to control site respectively [(crude OR=4.051: 95%CI of OR=2.982-5.503, P<0.05) (Adjusted OR=10.307: 95%CI of OR=6.284-16.904, P<0.05].

#### CONCLUSION AND RECOMMENDATION

The CHW led health education intervention was effective in increasing utilization of cervical cancer screening services in Kitui County. CHWs providing level one health services, therefore, need to integrate cervical cancer awareness and screening messages in their service delivery. This will promote cervical cancer screening and trigger early treatment and management of cervical cancer, hence bringing down the burden of cancer in the country.

Keywords: Cervical cancer, Screening, Community Health Workers, Health Promotion

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### Introduction

Cervical cancer is the malignant neoplasm of the cervix uteri. It is the second most common cancer among women worldwide, with an estimated 528,000 new cases and 266,000 deaths among women each year. A disproportionate number of these cases (85 %) and deaths (87 %) occur among women living in low- and middle-income countries. Women living with HIV are at increased risk of developing cervical cancer and experience more rapid progression of the disease (Finocchario-Kessler et al., 2016). While industrialized countries have reduced its incidence by over 70% in the last 50 years, the burden seems to be on the rise in less developed countries. It is expected that the incidence of cervical cancer in developing countries will rise from 444,546 to 588,922 between 2012 and 2025 (Abiodun et al., 2014) and (United Nations, 2019).

Cervical Cancer is a social disease especially of the poor and less educated for whom the risk factors are most prevalent (Abiodun et al., 2014). Research has established that the high mortality rate from cervical cancer

globally could reduced be through а includes comprehensive approach that prevention, early diagnosis, effective screening and treatment programmes (Finocchario-Kessler et al., 2016)(Topazian et al., 2016). Screening aims at detecting precancerous changes, which, if not treated, may lead to cancer. Women who are found to have abnormalities on screening need follow-up, diagnosis and treatment, in order to prevent the development of cancer or to treat cancer at an early stage. The World Health Organization (WHO) has reviewed the evidence regarding the possible modalities to screen for cervical cancer to include the following: screening should be performed at least once for every woman in the target age group (30-49 years) when it is most beneficial. HPV testing, cytology and visual inspection with acetic acid (VIA) are all recommended screening tests. Cryotherapy or loop electrosurgical excision procedure (LEEP) can provide effective and appropriate treatment for the majority of women who screen positive for cervical pre-cancer, and screen-and-treat" and "screen, diagnose and treat" are both valuable approaches (World Health Organization, 2014).



Cervical cancer is associated with a huge financial and social burden, particularly in countries where screening programmes are not Diagnosing cervical cancer at an available. early stage and providing access to effective treatment can significantly improve the likelihood of survival. Currently, in many low resource settings, the disease is often not identified until it is advanced or treatment is inaccessible resulting in a higher rate of death from cervical cancer (World Health Organization, 2014). The National Cancer Control Strategy 2017-2022 indicates that, in Kenva cancer is the third most common cause of death after infectious and cardiovascular diseases with cervical cancer contributing 20% of cancer deaths (Ministry of Health, 2017). The Kenya Demographic Health survey 2014 indicates that uptake of cervical cancer screening services is very low at 14%. In the Eastern region of Kenya, only 12.8% have ever had a cervical cancer examination (Kenya National Bureau of Statistics (KNBS) and ICF Macro, 2015).

Engaging Community Health Workers in health service delivery especially in resource poor countries has been found to be effective (Chowdhury et al., 2013)(Chhetry et al., 2005). The World Health Report 2006 argued that community health workers (CHWs) have the potential to be part of the solution to the human resource crisis affecting many countries. CHWs provide a variety of functions, including outreach, counseling and patient home care as well as representing a resource to reach and serve disadvantaged populations. There has been mounting evidence to demonstrate the positive potential of community health workers in improving equitable access to care and health outcomes (World Health Organization and Global Health Workforce Alliance, 2012). In Kenva, CHWs are in level one of the Kenvan healthcare service provision and a central pillar of primary health care delivery at the community level (Kisia et al., 2012). The aim of this study was to assess the effect of a Community Health Worker led health education intervention in promoting uptake of cervical cancer screening services in Kitui County-Kenya.

## **Materials and Methods**

The study was carried out in Kitui County. Kitui county has eight sub-counties namely Kitui rural, Kitui central, Kitui West, Kitui East, Kitui South, Mwingi North, Mwingi West, and Mwingi Central.

This was a quasi-experiment with one pre-intervention and one post intervention survey conducted in both intervention and control sites. Kitui East was the intervention site while Mwingi West was the control site. The intervention site received a Community Based Health Education intervention (CBHEI) targeting on promoting awareness and screening of both breast and cervical cancer. The focus of the CBHEI was to raise awareness and promote early screening of both cervical and breast cancer in the intervention site. Therefore, the intervention was designed following a validated United Kingdom breast and cervical cancer awareness modules (Cancer Research UK, 2010) and (UCL Health Behaviour Research, 2008).

The key elements of the intervention included the following: developing a breast and cervical cancer awareness training curriculum and manual which included awareness of screening methods as well as importance of early breast cancer screening; validation of the training messages and materials; recruiting voluntary Community Health Workers (CHW) and training them on breast cancer awareness and screening; assigning CHWs to train community members in their various jurisdictions (Community Units); and lastly following up to ensure CHWs carry out the trainings.



Purposive and simple random sampling were employed in this study. Purposive sampling was employed to identify the intervention and control sites while simple random sampling was used to identify the study participants. The predicted total population of women in Kitui county by 2018 was 579 230. Total number of women in Kitui East and Mwingi West (Intervention and control site respectively) was 10,187 and 10,639 respectively (Kenya National Bureau of Statistics, 2019). This being over 10,000, sample size was determined as 422 participants based on a formula by Fisher found in (Fisher A.A, Laing J.E, Stoeckel J.E., 1998).

At baseline, a sampling frame of 5320, and 6415 households with a woman of reproductive age was established in intervention and control sites respectively. 422 women were randomly identified from each sampling frame. Data was collected from 402 and 404 women in control and intervention sites respectively. In end term survey a sampling frame of 6124 and 5397 women were identified. After selecting 422 households in both intervention and control, data was collected from 405 and 409 respondents in control and intervention sites respectively. Data was collected using a research assistantadministered questionnaire.

The CHW intervention was the quasiindependent variable while the dependent variable was uptake of cervical cancer screening services. Data analysis was done using frequencies and percentages, Z score tests, and ODDs Ratios. This study was subjected to the Kenyatta National Hospital-University of Nairobi Ethics Review committee (KNH-UON ERC) for ethical review and approval.

#### **Results**

# Socio Demographic Characteristics

Table 1 at the end of this article represents a summary of the socio-demographic characteristics of the study population.

# Uptake of Cervical Cancer Screening Services

At baseline survey, data revealed that 22% and 20.4% of the participants had sought cervical cancer tests in intervention and control sites respectively. At the end time survey this proportion increased to 52.6% in intervention site. In the control site, a slight increase to 21.5% was observed. Table 2 represents a summary of this data.

# Z-Score Tests: Change in Proportions of Cervical Cancer Tests

A Z score statistic test conducted to establish if there was any difference in the proportion of participants who sought cervical cancer screening tests at baseline compared to control indicated that in the intervention there was a 30.6% significant increase of participants who sought cervical cancer screening services in the intervention site (Z score =8.9978, P<0.05). In the control site, there was a 1.1% increase in the number of women who sought cervical cancer screening services, however, this change was not significant (Z score= 0.3782, P>0.05). Table 3 presents a summary of these results.



# *Difference in Differences* (*DiD*) *Tests*

A DiD test statistic indicates that there was a net increase of 29.5% of participants who sought cervical cancer screening services in the 8 months period of the intervention. The following equation illustrates the DiD calculations: (52.6%-22.0%) - (21.5%-20.4%) = 29.5%.

# Odds Ratios Indicating Probabilities of Seeking Cervical Cancer Tests in Intervention Site Compared to Control

At baseline survey, a regression analysis established that there was no significant difference in the odds of seeking cervical cancer screening services in both intervention and control sites [(crude OR=1.103: 95%CI of OR=0.786-1.546, P>0.05) (Adjusted OR=1.300: 95%CI of OR=0.841-2.009, P>0.05]. Table 4 and 5 represent a summary of these findings.

A comparison between intervention and control sites at end term survey revealed a significant difference in the odds of utilization of cervical cancer tests among the participants of the two groups. The odds of utilization of cervical cancer tests were higher in intervention site compared to control site in both the crude and adjusted odds ratios. Women in intervention site were 4 and 10 times more likely to seek cervical cancer screening tests in the crude and adjusted odds ratios respectively [(crude OR=4.051: 95%CI of OR=2.982-5.503, P<0.05) (Adjusted OR=10.307: 95%CI of OR=6.284-16.904, P<0.05]. Tables 6 and 7 represent a summary of these findings.

## Discussion

The key findings in this study revealed that the intervention increased the proportion of women who sought cervical cancer screening services by 29.5% over the 8 months of the intervention time as shown by the DiD statistic.

The results also revealed that the odds of seeking cervical cancer screening services were 10 times higher in the intervention site compared to control sites. These statistics imply that the intervention was successful in promoting utilization of cervical cancer screening services in the intervention site. This can be justified mostly by the higher odds of utilization of cervical cancer services in intervention site compared to control and also the net increase in the proportion of women utilizing such services in the intervention site over the 8 months of implementation time.

The implication is that CHWs were effective in promoting the importance of seeking cervical cancer services among women of reproductive age in the intervention site and this is the reason why an increase (though not 100% increase) was observed in the intervention site compared to control site.

systematic review in which Α researchers reviewed; randomized control trials (43 studies). pre-post with concurrent comparison groups (11 studies), and or pre-post (12 studies) established that interventions engaging CHWs to increase demand and access to cervical cancer screening are not only costeffective but also promote cancer screening (Community Preventive Services Task Force, 2019).



A scoping literature search of 11 major databases and the grey literature performed between 1978 and 2018 and in which 420 articles screened also revealed that communitybased approaches to cervical cancer screening are feasible, although the sociocultural context plays an important role in the acceptability of these interventions. From the 15 studies identified and included in the re- view, CHWs were noted to play a role in community education and awareness raising initiatives, assisting in or conducting screening, and followup during the screening process (O'Donovan et al., 2019).

The systematic together with the scoping reviews provide overwhelming evidence suggesting that CHW interventions have been very effective in promoting cervical cancer screening at the community level. This indicates that the findings of this study are consistent with the body of knowledge from findings of other studies conducted in this topic globally.

# Conclusion and Recommendations

The CHW led Health education intervention was effective in increasing utilization of cervical cancer screening services in Kitui County. The odds of seeking cervical cancer screening services were 10 times higher in the intervention site compared to control site respectively [(crude OR=4.051: 95%CI of OR=2.982-5.503, P<0.05) (Adjusted OR=10.307: 95%CI of OR=6.284-16.904, P<0.05].

The Ministry of Health of Kitui County and at the national level (Kenya) need to embrace level one health service deliver in order to reduce the burden of cervical cancer in the country. CHWs providing level one health services need to integrate cervical cancer awareness and screening messages. This will promote cervical cancer screening and trigger early treatment and management of cervical cancer cases. This will help bring down the burden of cancer in the country.

## **Competing Interests**

The authors declare no competing interest.

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# Appendix

Table 1: Social Demographic Characteristics of the Study Participants										
Categories	Baseli	ine Surve	ey		End term Survey					
			•		(8 months)					
Age	Contro	ol	Inter	Intervention		rol	Interve	Intervention		
C	F	%	F	%	F	%	F	%		
16-20 years	12	3.0	0	0	20	4.9	21	5.1		
21-25 years	63	15.7	31	7.7	76	18.8	64	15.6		
26-30 years	134	33.3	106	26.2	117	28.9	112	27.4		
31-35 years	139	34.6	149	36.9	138	34.1	132	32.3		
36-40 years	50	12.4	113	28.0	54	13.3	80	19.6		
41-45 years	4	1.0	5	1.2	0	0	0	0		
Total	402	100	404	100	405	100	409	100		
Parity	F	%	F	%	F	%	F	%		
1 Child	23	5.7	12	3.0	30	7.4	13	3.2		
2 children	22	5.5	15	3.7	13	3.2	19	4.6		
3 children	58	14.4	60	14.9	67	16.5	64	15.6		
4 children	124	30.8	105	26.0	89	22.0	122	29.8		
5 children	89	22.1	93	23.0	99	24.4	99	24.2		
6 children	70	17.4	63	15.6	82	20.2	65	15.9		
7 and above	16	4.0	56	13.9	25	6.2	27	6.6		
Total	402	100	404	100	405	100	409	100		
Education	F	%	F	%	F	%	F	%		
Level										
No education	10	2.5	33	8.2	5	1.2	27	6.6		
Primary level	80	19.9	138	34.1	112	27.7	96	23.4		
Secondary level	227	56.5	143	35.4	167	41.2	206	50.4		
College/ University	85	21.1	90	22.3	121	29.9	80	19.6		
Total	402	100	404	100	405	100	409	100		
Occupation	F	%	F	%	F	%	F	%		
Not working	10	2.5	7	1.7	15	3.7	29	7.1		
Peasant	227	56.5	201	49.8	222	54.8	223	54.5		
Farmer										
Business	114	28.4	102	25.2	101	24.9	99	24.2		
employment	51	12.7	94	23.3	67	16.6	58	14.2		
Total	402	100	404	100	405	100	409	100		
Marital	F	%	F	%	F	%	F	%		
Status										
Single	31	7.7	18	4.5	34	8.4	33	8.1		
Married	344	85.6	297	73.5	327	80.7	310	75.8		
Widowed	17	4.2	65	16.1	26	6.4	48	11.7		
Separated/ Divorced	10	2.5	24	5.9	18	4.5	18	4.4		
Total	402	100	404	100	405	100	409	100		



Survey	Intervention site		Control Site	
	Have you ever soug screening services?	ght Cervical cancer	Have you eve cancer screening	er sought Cervical services?
	Frequency	%	Frequency	%
Baseline	89/404	22.0	82/402	20.4
End-Term (8 months)	215/409	52.6	87/405	21.5

#### Table 2: Uptake of Cervical Cancer Screening Services

 Table 3: Z score Tests Testing Change in Proportions of Cervical Cancer Tests

Study Site	Base line	End term	Z-Score test and P values (Baseline Vs. End term)
Intervention	89/404 (22.0%)	215/409 (52.6%)	Z score = 8.9978, P<0.05
			(30.6% difference is significant)
Control	82/402	87/405 (21.5%)	Z score =0.3782, P>0.05,
	(20.4%)		(1.1% Difference is not significant)

								95% C.I.for EXP(B)	
Study Phase		В	S.E.	Wald	df	Sig.	Exp(B)	Lower	Upper
Baseline Step 1 <sup>a</sup>	Have you ev gone for Cervic cancer screening	ver .098 cal ?	.172	.321	1	.571	1.103	.786	1.546
	Constant	016	.079	.039	1	.843	.984		

 Table 4: Crude Odds Ratio for ever Screened for Cervical Cancer (Base line)

a. Variable(s) entered on step 1: Have you ever gone for Cervical cancer screening?



					-			95% C EXP(B	.I.for )
Study Phase		B	S.E.	Wald	df	Sig.	Exp(B)	Lower	Upper
Baseline Step 1 <sup>a</sup>	Have you ever gone for Cervical cancer screening?	.262	.222	1.397	1	.237	1.300	.841	2.009
	Age of respondent	.925	.160	33.383	1	.000	2.522	1.843	3.451
	Number of children of respondent	529	.115	21.030	1	.000	.589	.470	.739
	Level of education of respondent	927	.146	40.246	1	.000	.396	.297	.527
	Primary Occupation of respondent	.217	.161	1.819	1	.177	1.242	.906	1.702
	Marital status	.593	.158	14.029	1	.000	1.810	1.327	2.468
	Total monthly household income	.000	.000	19.692	1	.000	1.000	1.000	1.000
	Constant	-1.606	.533	9.072	1	.003	.201		

#### Table 5: Adjusted Odds Ratios for ever Screened for Cervical Cancer (Baseline)

a. Variable(s) entered on step 1: Have you ever gone for Cervical cancer screening? Age of respondent, Number of children of respondent, Level of education of respondent, Primary Occupation of respondent, Marital status, Total monthly household income.



	v			v				95% C.I.for EXP(B)	
Study Phase		В	S.E.	Wald	df	Sig.	Exp(B)	Lower	Upper
End-term (18	Step 1 <sup>a</sup> Have you ever gone	1.399	.156	80.058	1	.000	4.051	2.982	5.503
Months)	for Cervical cancer								
	screening?								
	Constant	494	.091	29.427	1	.000	.610		

a. Variable(s) entered on step 1: Have you ever gone for Cervical cancer screening?

Table 7: Adjusted Odds Ratios for Ever Screened for Cervical Cancer (End Term)

								Exp	95% C EXP(B	C.I.for B)
Study Pha	ise		В	S.E.	Wald	df	Sig.	<b>(B)</b>	Lower	Upper
End-term	(18 Step	Have you	ever 2.333	.252	85.408	1	.000	10.307	6.284	16.904
Months)	$1^{a}$	gone for Ce	rvical							
		cancer screet	ning?							
		Age	of .396	.171	5.389	1	.020	1.486	1.064	2.077
		respondent								
		Number	of256	.130	3.892	1	.049	.774	.600	.998
		children	of							
		respondent								
		Level	of368	.137	7.188	1	.007	.692	.529	.906
		education	of							
		respondent								
		Primary	-1.464	.217	45.644	1	.000	.231	.151	.354
		Occupation	of							
		respondent								
		Marital statu	s .356	.153	5.393	1	.020	1.427	1.057	1.926
		Total mo	onthly .000	.000	15.215	1	.000	1.000	1.000	1.000
		household in	come							
		Constant	.477	.431	1.224	1	.269	1.611		

a. Variable(s) entered on step 1: Have you ever gone for Cervical cancer screening?, Age of respondent, Number of children of respondent, Level of education of respondent, Primary Occupation of respondent, Marital status, Total monthly household income.