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Factors Associated with efficacy of Healthcare Workers in Prevention and Control of Cervical Cancer in Machakos, Kenya

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Abstract

Cancer of the cervix is one of the leading causes of deaths among women of reproductive age in the world. It is the most common cancer among women in 45 countries, with global reports of more than 500,000 new cases annually for each death from cancer of the cervix. In 2013, the estimated number of new cases and deaths from cervical cancer in China were 100,700 and 26,400, respectively. An estimated 54,000 women are diagnosed with cervical cancer and 25,000 women die from the disease each year in Europe. In Kenya cervical cancer is responsible for 25 deaths per 100,000 cases due to lack of awareness; mismanagement and incompetence, late diagnosis as a result of poor attitudes and perceptions; lack of treatment facilities; high cost of treatment; and high poverty indexes among other factors. This notwithstanding, the disease is preventable when detected early and through regular screening as well as administration of cervical cancer vaccine at the right age. Healthcare workers play a central role in the prevention and control of cervical cancer. As such their competence, awareness, attitudes and grasp of the right treatment interventions and technologies is critical in the fight against the disease. Inspired by advances in health information and successes in utilizing the same in western countries to reduce mortality and incidence rates, the goal of this study was to examine factors associated with efficacy of healthcare workers in battling advanced stages of cervical cancer in Machakos County, Kenya. The study adopted a descriptive cross-sectional survey that used quantitative method. The target population comprised of healthcare workers that deal directly with patients susceptible to cervical cancer. Simple random sampling was used to give each element of the target population an equal chance of being selected. The researcher used a questionnaire for data collection because of its effectiveness in eliciting respondent's feelings, beliefs and experiences. Data was analyzed using descriptive and inferential statistics. After the data was summarized, the researcher identified the existing relationships and using inferential statistics made generalizations from the data in view of the study objectives. There was a gap in healthcare workers training and their attitude towards

cervical cancer patients was poor. The study concluded that training, awareness, attitudes and perceptions, as well as technology use by healthcare workers were positively and significantly related to prevention and control of cervical cancer. The study recommended that, health facilities should strive to enhance work experience by providing specialized oncology training to their staff, as well as the right technologies to control and prevent cervical cancer. In addition, it is recommended that all hospitals assess healthcare workers' attitudes regularly to ensure that patient care is not compromised.

Keywords: *Competence, cancer awareness, Attitudes of healthcare workers, Technology, Efficiency of healthcare workers and cervical cancer.*

1.1 INTRODUCTION

Cancer of the cervix is the most common cancer among women in 45 countries, with global reports of more than 500,000 new cases of Cervical Cancer annually (Kiamba *et. al*. 2016). In 2013, the estimated number of new cases and deaths from cervical cancer in China were 100,700 and 26,400, respectively. The crude incidence of cervical cancer was 15.17/100,000. The age-standardized incidence rates based on the Chinese standard population (ASIRC) and the world standard population (ASIRW) were 11.30/100,000 and 10.30/100,000, respectively. An estimated 54,000 women are diagnosed with cervical cancer and 25,000 women die from the disease each year in Europe (WHO/ICO, 2010). Country-specific age-standardized incidence rates of cervical cancer vary across the European region from 2.1 to 23.9 per 100,000 women per year and mortality rates range from 1.1 to 13.7 per cent (Elfstrom KM, *et. al,* 2015).

In developing countries, cancer of the cervix is responsible for 270,000 (85%) new cases and 90% deaths. Eastern Africa is the region most affected with Cervical Cancer with age standardized incidence rate and mortality of 25.3 and 43.5 per 100,000 women per year respectively (WHO, 2010). As a matter of fact, Cervical Cancer Action Report Card 2015, identifies that cervical cancer is the number one cancer killer among women in third world countries. Furthermore, the World Health Organization projects the number of deaths from cervical cancer to be 443,000 by the year 2030 in less developed countries.

In Kenya, cervical cancer is second leading with 25 per 100,000 death cases due to lack of awareness; inadequate diagnostic equipment; lack of treatment facilities; high cost of treatment; as well as high poverty indexes(poor or insufficient oncology skills in the health workers) (KDH, 2013). Inspired by advances in medical technology and enhancement of workers oncology skills in western countries to battle cervical cancer, the goal of this study was to examine the extent to which this potential has been explored in developing countries, specifically Machakos County, Kenya. Although Kenya is a major referral hub for cancer treatment and care for patients from neighbouring countries, the bulk of her own rural population have limited access to specialist services for any type of cancer, including cervical cancer. A majority of the available specialist cancer screening and treatment service providers (hospitals) are in the major cities (Owuor, 2016). This coupled by other factors has led to high incidence and mortality rate from cervical cancer in the country.

According to Kenya's Ministry of Health, 7 to 8 women die every day as a result of cervical cancer and it is the third leading cause of deaths in the country after infectious and cardiovascular diseases (KDHS, 2014). Cervical cancer ranks as the first most frequent cancer among women in Kenya

and the first most frequent cancer among women between 15 and 44 years of age. Conversely, it was once among the leading causes of death in developed countries like America, Europe and China among others. However, incidences of invasive Cervical Cancer have declined steadily over the years in these countries. The decline can primarily be attributed to increased use of medical technology by healthcare workers in the fight against the vice. This has been possible through systematic enhancement of healthcare worker's oncology proficiency, skills and capacity, awareness, attitudes and perceptions, and use of technology. The potential of utilizing these technologies by healthcare workers to transform health has been proven but the limits are still unknown (DeBlois & Millefoglie, 2015). As such, this study posits that efficient use and sharing of information on cervical cancer by healthcare workers can go a long way in checking the disease especially in developing countries. However, various factors associated with efficacy of healthcare workers in the management of this disease may determine the success in the fight against it. These factors include caregiver's awareness, competence, perceptions, attitudes and application of technology in the fight against advanced stages of cervical cancer.

1.2 Statement of the Problem

Kenya, like other countries in East Africa, has a very high prevalence of cervical cancer. The country has a population of about 13.5 million women aged 15 years and above. All these women are at risk of cervical cancer. In fact, cervical cancer is the leading cause of cancer related deaths among women in Kenya (International Agency for Research on Cancer, 2017). Ninety-five percent of patients with cancer in developing countries are diagnosed very late, when the disease has gained roots in the body and when treatment options are few and survival chances are limited. As such, dynamic management, control and monitoring of cervical cancer incidence and mortality is critical. The success of this process is highly dependent on healthcare workers who interact and relate with women in their day to day healthcare matters. Likewise, their competence, training and skills, perceptions and attitudes, as well as awareness of emerging trends on cervical cancer management and control interventions must come to play. These factors determine their propensity to use available information on cervical cancer and thereby their efficacy in fighting the advanced stages of this disease.

Kivuti-Bitok *et al.* (2015), in her study on prospects and barriers facing managers of cervical cancer in Kenya, concluded that most healthcare workers lacked specialized training on cervical cancer, had poor attitude towards cervical cancer screening procedures as well as towards cervical cancer patients. This impacted on their efficacy in the fight against cervical cancer. As such, these workers were unlikely to use available information on cervical cancer to control and prevent the disease from advancing. Further, the study concluded that Health facilities were lacking in infrastructure and medical provisions, while some healthcare workers felt ill-equipped in technological skills. This attitude of incompetence be it perceived or real, can be a great hindrance to one's ability to effectively utilize resources and information at their disposal to fight and control cervical cancer. These observations resonate with the goals of this project since healthcare workers are key players and drivers of public health function in the country.

Unlike Kivuti-Bitok's (2015) study which was conducted in 2 referral hospitals and 4 out of 8 regional public hospitals in Kenya, the current study was carried out in rural healthcare facilities in Machakos, Kenya. As such, it sought to assess how some of the factors raised in Kivuti-Bitok's

study (for example, competency and attitude), influence the efficacy of healthcare workers in the fight against cervical cancer, especially in rural health facilities.

Notwithstanding challenges associated with uptake of cervical cancer screening, the possibilities of replicating these innovations from western to developing countries seems unlimited. Cervical cancer is a serious issue in women's health, and prevention strategies need to be enhanced, such as human papilloma virus (HPV) vaccination and screening programs. Proper collection, storage, collaboration and retrieval of information by healthcare workers is critical for these interventions to have a lasting impact. Availability or lack of these skills may greatly inform the efficacy of healthcare workers in the fight against cervical cancer.

Kenya is one of the few countries in East Africa with a policy and a strategy on the use of ICT to improve healthcare. The Kenya national eHealth Policy 2016-2030 (DigiAfya) aims at creating an enabling environment for the sustainable adoption, implementation and efficient use of eHealth products at all levels of healthcare delivery in Kenya. But the present findings show that although the national policies offer a road map on how to utilise technology and information in healthcare, the county governments are still formulating their health policies following the adoption of a devolved system of government (Owuor, 2016). This points to the fact that healthcare workers may not be sufficiently utilizing information more so in the fight against cervical cancer, hence the need for studies like this. Out of the literature reviewed above, the researcher established a gap in knowledge in that, a study on the factors associated with efficacy of healthcare workers to prevent advanced stages of cervical cancer in rural settings in Kenya has not been carried out.

Healthcare worker's perceptions on cervical cancer can affect their attitude to use and get more information on new intervention on the disease. Their training and thus competence on oncology may impact greatly on their ability to exhaust existing information and available technology resources to assist their patients in the fight against advanced stages of cervical cancer. In addition, healthcare workers must remain updated on cervical cancer developments (awareness) through the use of emerging information and thereby improve their efficiency in the fight against the disease. Hence, lack of necessary equipment, inadequate infrastructure, and facilitation of resources such as internet by healthcare facilities may affect their efficacy in prevention and control of advanced stages of cervical cancer.

Therefore, this study explored the extent to which efficacy of healthcare workers in prevention and control of cervical cancer has been impacted by various factors such as competence, attitude, awareness, and technology.

1.3 Objectives of the Study

The overall objective of this study was to investigate factors associated with efficacy of healthcare workers in cervical cancer prevention and control in Machakos, Kenya.

The research project aimed at achieving the following specific objectives:

i. To find out how competence of healthcare workers impacts on their efficiency in cervical cancer prevention and control

ii. To determine how cervical cancer awareness of healthcare workers can influence the fight against cervical cancer

iii. To find out how attitudes of healthcare workers affects cervical cancer prevention and control

iv. To explore the extent to which technology impacts on the efficiency of healthcare workers in the fight against cervical cancer.

2.0 LITERATURE REVIEW

2.1 Theoretical Framework: Social-Cognitive Theory

Social cognitive theory is a learning theory based on the idea that much of human learning occurs in a social environment by observing others. Through observation, healthcare workers acquire knowledge of rules, skills, strategies, beliefs and attitudes. They learn about the usefulness and appropriateness of behaviours by observing models and consequences of modelled behaviours. Consequently they act in accordance with their beliefs concerning the expected outcomes of actions. Therefore, the interplay of these factors (cognition, environment and behaviour) in the life of a healthcare worker highly impacts on the quality of care given to cervical cancer patients.

Social cognitive theory is based on human agency and capability theoretical foundations. Human agency posits that, instead of being just shaped by environments or inner forces, individuals are self-developing, self-regulating, self-reflecting and proactive. As such healthcare workers should aim at influencing women to undergo screening, proactively mobilize support for screening campaigns, so as to collectively defeat cervical cancer. Likewise, it is posited that they have within their disposal information on cervical cancer available through their mobile phones, social media and computer systems at their workplaces. This is made possible by technology and internet penetration in the country. As such, in an effort to enhance their competencies, healthcare workers can gain more knowledge on cervical cancer via resources within their reach and thereby, use information to prevent advanced stages of cervical cancer.

In light of the above theoretical foundations, social cognitive theory as espoused by Albert Bandura, informed and guided the study on these human attributes in healthcare workers. The theory was essential in reflecting on how healthcare workers approach cervical cancer screening, prevention and control.

2.2 Empirical Literature

Zheng Rongshou, *et al.* (2011) set out to do a study on National estimates of cancer prevalence in China in the year 2011, using data from 177 cancer registries and covering 175 million people. The paper provided supposedly the first systematic analysis on 5-year cancer prevalence for 25 major cancers in China. In the study, it was concluded that the huge number of cancer survivors requires resource allocation to improve health care programs and primary prevention, especially in rural areas. Likewise, this study aims at assessing the extent to which cervical cancer information can be harnessed by healthcare workers to inform recommendations and probably decisions similar to this. 90% percent of Machakos County is located in rural settings whose healthcare facilities may not be comparable to China and as such, carrying out this study may unearth critical data and information narrative in the fight against advanced stages of cervical cancer.

Organized cervical screening in Europe, has been shown to reduce cervical cancer mortality by up to 80% at the population level with the level of mortality reduction related to the screening programme coverage (Elfstrom KM *et al.*, 2015). In this study, Elfstrom *et al.(*2015) sought to identify the key organizational components that determine effectiveness, by performing a Europe-wide survey on the status of organization and organized quality assurance (QA) measures in cervical cancer prevention programmes, as well as organization-associated costs. Evidence from countries such as England, Finland, Italy and the Netherlands demonstrated decreases in incidence and mortality following implementation of organized screening. The study concluded that most countries found it hard to estimate the costs associated with launching and operating the organized programme. This points to information and technology use by healthcare workers, whereby when it is properly utilized it can influence efficiency by changing how planning, organization and implementation of cervical cancer programmes are carried out.

Right training impacts right competences and skills for proper and timely diagnosis of cervical cancer. Early screening is known to prevent up to 80% of the invasive cervical cancer cases (Rositch AF *et al.*, 2012). Likewise, competence plays an important role in deciding preventive behaviours, when, where and how to use certain information with a patient. Hence, this study aimed at assessing how healthcare workers training and competence in cervical cancer, impact on its prevention and control within Machakos County, Kenya.

Kivuti-Bitok LW, *et al.* (2015), work on prospects and barriers facing managers of cervical cancer in Kenya, documents opportunities and challenges encountered in managing cervical cancer from the healthcare workers' perspectives. This resonates with the goals of this study since these are key players and drivers of public health policy in the country. Four themes were identified. Patient related challenges included low levels of knowledge on cancer of the cervix, low levels of screening and a poor attitude towards screening procedure. Individual health care providers identified a lack of specialized training, and difficulty in disclosure of diagnosis to patients of cervical cancer in good time. Health facilities were lacking in infrastructure and medical supplies. Some managers felt ill-equipped technologically hence the need for training to enhance their skills in this area.

It is important for healthcare workers to have affirmative attitudes towards patient care if control of cervical cancer and good quality care is to be provided. An explorative qualitative study was carried out in KwaZulu-Natal to establish nurses' attitudes towards providing care to patients in rural hospitals. The study concluded that while some nurses were passionate about nursing for altruistic reasons, many healthcare workers had negative attitude towards patients care (Haskins JLM, et.al. 2016). Reasons were staff shortages, high patient loads, absenteeism, and poor interpersonal communication. The report generally reflects poor patient care and wilful neglect of patients' basic support services. This in turn postulates negative impact on efficiency of healthcare workers in their quest to fight against cervical cancer. Healthcare workers blamed sub-standard nursing care on the attitudes of patients or patients' relatives, as well as on lack of management support. As such their efficiency was affect by these factors.

Technology has been highly utilized in this area by the western countries to enhance patience follow-up, timely delivery and accuracy of information. As a result of the above, the trend in cervical cancer prevention, care and control is going digital as shown in recent studies such as *Use of Telehealth in Cervical Cancer Screening and Care in Kenya* by Owuor, John (2016). This study

aimed at answering the question: can telehealth be used to improve cervical cancer screening and care in western Kenya? The participants' responded on the positive showing that telehealth can be used successfully to improve cervical cancer prevention and care. The findings confirmed the assumption that the use of innovative telehealth data solution to link Health care workers, particularly in rural remote health care facilities, to tertiary healthcare facilities can improve cervical cancer prevention, diagnosis, treatment, and care in limited resource settings. Use of telehealth can form part of the solution to some of the health system challenges such as inadequate Healthcare workers and equipment. Therefore, sharing of information, in the digital platforms by healthcare workers will enhance their efficiency and become the next frontier in the fight against advanced stages of cervical cancer.

2.3 Summary and existing gaps in literature

Review of literature shows that several studies have been done focused on utilization of cervical screening services, risk factors and treatment. However, there are limited works which specifically address the knowledge on efficacy of healthcare workers towards prevention and control of advanced stages of cervical cancer. The efficacy of healthcare workers is hinged on several factors which need to be addressed holistically by relevant stakeholders in an inclusive manner. Despite the availability of cervical cancer information and its accessibility by health care providers in hospitals in Kenya the information is rarely used. There is scanty information on efficiency of Healthcare Workers to Prevent Advanced Stages of Cervical Cancer not only in Machakos County but also in Kenya, and Africa at large. Therefore, this study sought to explore the extent to which attitude, awareness, training and technology solutions (such as mobile phones, infrastructure, equipment, etc), have influenced healthcare workers efficiency and effective cervical cancer screening, prevention and control in Machakos County in Kenya.

2.4 Conceptual Framework

The following conceptual framework has been derived from the literature reviewed as well as applicable theories in this study.

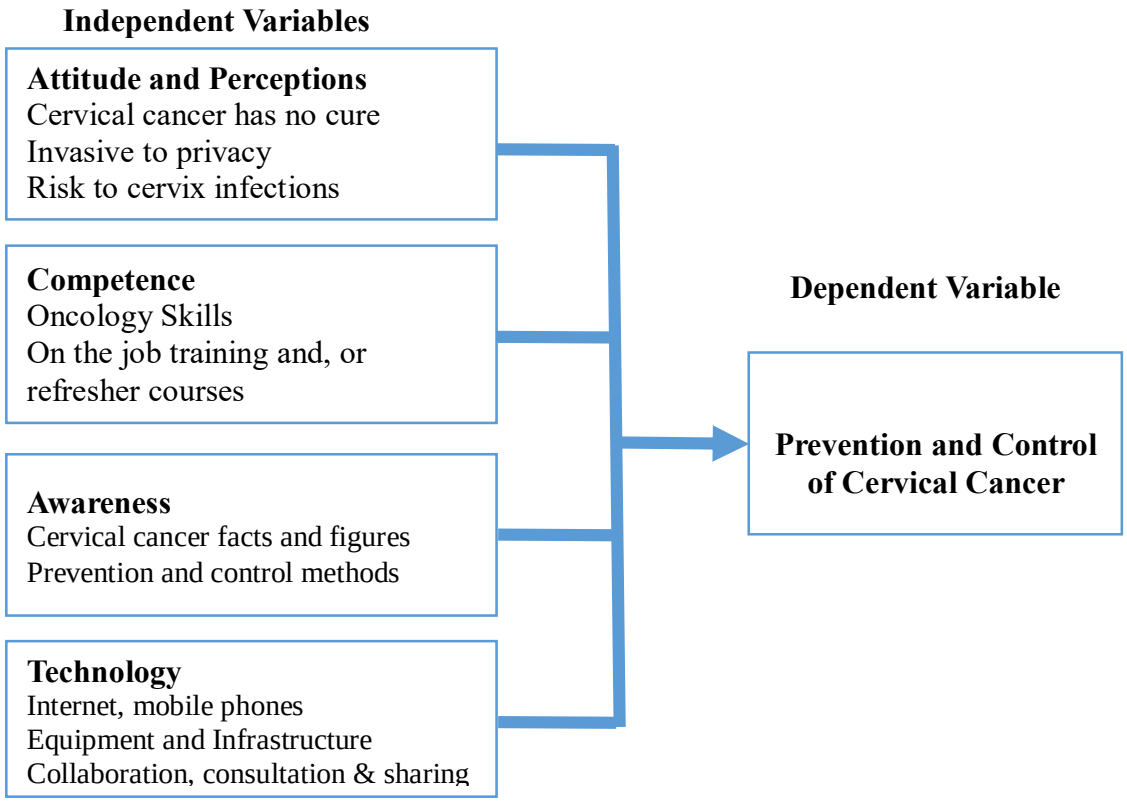

Figure 1: Conceptual Framework

Source: Adopted and modified from literature review, (2018).

The conceptual Framework above presumes that the Attitudes and beliefs (Cancer is terminal, has no cure, embarrassing/invasive procedure), Competence of healthcare workers (Training, self-efficacy), Awareness (Cervical cancer facts and figures, existing interventions, sensitization initiatives, follow-up mechanisms), as well as Technology (availability and use of various technologies and infrastructure), determined the efficacy of healthcare workers in planning, scaling up, management and control of advanced stages of cervical cancer.

3.0 RESEARCH METHODOLOGY

The study used cross-sectional descriptive research design. The study was conducted in Machakos County. Machakos County has 8 sub counties including: Machakos central, Kathiani, Yatta, Mwala, Masinga, Kangundo, Matungulu, and Athi River. In the country there are 300 public health facilities. However, only 41 health facilities offer cervical cancer screening services (KDHS, 2014). The target population comprised of healthcare workers at their work stations, where data and information on cervical cancer cases was gathered. Heads of sections were likewise included

in the study because they occupy a unique and important place on key health issues such as prevention and control of cervical cancer. Simple random sampling was used to give each element of the target population an equal chance of being selected. According to Mugenda & Mugenda (2003) a sample size of 30% is a good representation of the target population. As such, the sample size of the study was 146 of the target population drawn as shown in Table 1;

Table 1 Proportion of respondents selected from each hospital

SN	Health facility name	Target Population	Sample size
1	Machakos Level 5 Hospital	99	33
2	Kathiani Sub-County Hospital	60	20
3	Mwala Health Centre	42	14
4	Mitaboni Health Centre	20	7
5	Muumandu Health Centre	25	8
6	Masinga Health Centre	25	8
7	Kivaa Health Centre	45	15
8	Kimutwa Health Centre	40	13
9	Mutituni Health Centre	25	8
10	Athi-river Health Centre	60	20
	Total	**441**	**146**

Source: Machakos Country Health Centres

The sampling units are healthcare workers in reproductive health departments and cancer units. The researcher opted to use questionnaire for data collection because of its effectiveness in eliciting the respondent's feelings, beliefs and experiences (Gay, 1992). Reliability was conducted through pilot test where test-retest technique was used to measure the same. Internal consistency technique was then used to establish the Cronbach Alpha coefficient where applicable. Content validity was used by the researcher in the development of the study questionnaire. The researcher ensured that all the study objectives were included in the study questionnaire. Face validity was employed by involving the expert opinion of my supervisors.

Data was analyzed using descriptive and inferential statistics. These include averages, percentages, frequencies and totals. When the data was summarized the researcher identified the existing relationships and using inferential statistics made generalizations from the data that affect the entire population. The statistics were used to give an informed true data characteristic.

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4.0 DATA ANALYSIS

4.1 Response Rate

4.1.1 Response rate

The study initially targeted 146 respondents. However, the questionnaires that were dully filled, returned on time and used for analysis were 145. Therefore, the study had a response rate of 99.3%. According to Mugenda and Mugenda (2003) and Kothari (2004) a response rate of 60% or more of the intended sample population should suffice. Cooper and Schindler (2003) also argues that a response rate exceeding 30 percent of the total sample size provides enough data that can be used to generalize the characteristics of a study problem as expressed by the opinions of few respondents in the target population. Thus, the response rate was satisfactory for data analysis.

4.1.2 Reliability test

Table 2 shows the reliability results for the variables used in the study.

Table 2: Reliability

Variable	Cronbach alpha	Items	Comment
Training	.724	7	Reliable
Knowledge	.781	6	Reliable
Attitude	.837	5	Reliable
Technology	.778	5	Reliable
Prevention and Control	.849	5	Reliable

Source: Survey data (2018)

Table 2 shows the reliability of the items used in the study questionnaire. The total items used in the questionnaire were 28. The study used internal consistency technique of reliability testing. In table 2, the Cronbach's Alpha coefficient for training was 0.724, for knowledge was 0.781, for attitude was 0.837, Cronbach's Alpha coefficient for technology was 0.778 and that of prevention and control was 0.849 indicating that all the variables used were reliable According to Gliem and Gliem (2013), a reliability coefficient that indicates an acceptable consistency of items in a questionnaire is of the range 0.7 to 1.

4.2 Descriptive statistics

This section discusses the descriptive findings on the study variables. The study used Likert scale to range the respondents' responses and the mean and standard deviation was determined so as to measure variance of the responses. The Likert scale used consisted of:

1=Strongly Disagree 2=Disagree 3=Neutral 4=Agree 5=Strongly Agree

4.2.1 Respondent's response on Knowledge of Cervical Cancer

The respondents were requested to indicate if they had heard about cervical cancer before and if yes, they were to indicate their source of information about the disease. They were further asked to indicate if they had training on cervical cancer in the past. Their responses are presented in table 3

Table 3:Knowledge about Cervical Cancer

Question	Yes (%)	No (%)
Ever heard of cervical cancer?	99.3	0.7
I got CC information from family	24.8	75.2
I got CC information from friends and colleagues	58.6	41.4
I got CC information from Media (Newspaper/TV/Radio	60.0	40.0
I got CC information from the internet	60.7	39.3
I got CC information from social media	51.7	48.3
I got CC information through Short courses/seminars	67.6	32.4
Ever had training on cervical cancer?	21.4	78.6

S**ource:** Survey data (2018)

Respondents were asked to indicate if they have ever heard about cervical cancer. The results in table 3 show that 99.3% of the respondents indicated **Yes** with only 0.7% indicating **No.** this shows that majority of the residents of Machakos county are aware of the existence of cervical cancer and so they are in a better position to seek treatment early enough. Respondents were asked to indicate their source of information about cervical cancer. The results were as shown in the table above. 24.8% indicated that they get information about cervical cancer from family, 58.6% from colleagues and friends, 60% indicated from media (Newspaper/TV/Radio), 60.7% of the respondents indicated that they get information from the internet, 51.7% from social media while another 67.6% indicated that they get cervical cancer information through short courses/seminars.

4.2.2 Descriptive on Training of Healthcare Workers

The table 4 represents the respondents' responses to statements on training of Healthcare workers

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Table 4: Training Of Healthcare Workers

Statement	Strongly Disagree (%)	Disagree (%)	Neutral (%)	Agree (%)	Strongly Agree (%)	Mean	SD
There is limited cervical cancer skills in our facility	4.10	13.80	14.50	49.00	18.60	3.64	1.07
If training and skill development improves, cancer management will get better	4.10	0.00	2.10	37.20	56.60	4.42	0.89
We have few healthcare workers who are trained in narcotic analgesics	5.50	2.10	9.70	43.40	39.30	4.09	1.03
Healthcare workers have had training in cervical cancer care and management	20.00	35.90	13.80	22.80	7.60	2.62	1.25
In our health centre, a cervical cancer diagnosis can be confirmed and disclosed to patients in good time	13.80	22.80	18.60	33.80	11.00	3.06	1.25
Many of the patients present a late stage of cervical cancer due to lack of proper diagnosis as well as mismanagement before referral to tertiary facilities	4.10	12.40	10.30	35.90	37.20	3.90	1.16
Nurses and doctors can now do cervical cancer screening and treatment procedures within our facility	14.50	22.80	14.50	35.20	13.10	3.10	1.30

Source: Survey data (2018)

Results in the table above shows that , 67.60 %(49.00+18.60) of the respondents agreed that there was limited cervical cancer skills in their facility, 14.50% of the respondents were neutral about the statement while only 17.90% of the respondents disagreed to the statement that their facility had limited cervical cancer skills. The results had a mean of 3.64 and a standard deviation of 1.07. The respondents were asked whether training and skills development would lead to an improvement in cancer management, majority of the respondents (93.80%) agreed, 2.10% of the respondents were neutral about the statement while another 4.10% of the respondents disagreed. The results had a mean of 4.42 and a standard deviation of 0.89. This shows that majority of the respondents were in agreement, however the responses were varied as indicated by the standard deviation of 0.89.

Concerning the statement that there were few healthcare workers trained in narcotic analgesics, 82.70% of the respondents agreed, 9.0% were neutral but another 6.60% of the respondents disagreed to the statement. The results had a mean of 4.09 indicating that majority of the respondents agreed but the responses were varied as indicated by the standard deviation of 1.03. As to whether the healthcare workers had had training in cervical cancer care and management in the area, majority of the respondents disagreed (55.90%), 13.80% of the respondents took a neutral ground while 30.40% of the respondents agreed. The results had a mean of 2.62 indicating that majority of the respondents disagreed however the responses were varied as indicted by a standard deviation of 1.25. Majority of the respondents (44.80%) agreed that in their health centre, a cervical cancer diagnosis can be confirmed and disclosed to patients in good time. 18.60% of the respondents neither agreed nor disagreed about the statement, while 36.60% of the respondents disagreed. The results had a mean of 3.06 meaning that majority of the respondents agreed to the statement however the responses were varied as supported by a standard deviation of 1.25.

Most of the respondents (73.10%) agreed that many of the patients presented a late stage of cervical cancer due to lack of proper diagnosis as well as mismanagement before referral to tertiary facilities, 10.30% of the respondents were neutral while 16.50% of the respondents disagreed. The results had a mean of 3.90 showing that majority of the respondents agreed to the statement however the responses were varied as indicated by a standard deviation of 1.16. 48.30% of the respondents agreed that nurses and doctors can now do cervical cancer screening and treatment procedures within their facility, 37.30% disagreed. The results had a mean of 3.10 indicating majority agreed however the responses were varied as supported by a standard deviation of 1.30.

The aggregate mean was 3.35, indicating that generally the respondents agreed with the statements on healthcare workers competence. The standard deviation was 1.13 indicating a reasonable variation on the responses. These results are in agreement with Owuor *et al.* (2017) assertion, that there is scarcity of trained oncology specialists in Kenya an aspect that poses a challenge in cervical cancer prevention and management. He notes that according Kenya Network of Cancer Organization, the country had "only 4 radiation oncologists, 6 medical oncologists, 4 paediatric oncologists, 5 radiation therapy technologists, 3 oncology nurses and 2 medical physicists" before 2016. As such training of healthcare workers will have profound impact on their efficiency in prevention and control of cervical cancer.

4.2.3 Respondents' response on Cervical Cancer Awareness

The respondents were asked to indicate what they knew about cervical cancer and their responses were as shown in table 5

Table 5: Cervical Cancer Awareness

Statement	Frequency	Percent
It is a malignant tumor of the uterus	22	15.2
It is the abnormal growth of cells in the cervix	121	83.4
It's a sexually transmitted disease of the cervix	2	1.4
Total	**145**	**100.0**

S**ource:** Survey data (2018)

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The respondents were asked to indicate what they understand with the term cervical cancer. Results in table 5 shows that, 15.20% of the respondents indicated that cervical cancer is a malignant tumor of the uterus, 83.4 % of the respondents indicated that it is the abnormal growth of cells in the cervix while another 1.4% believed cervical cancer is a sexually transmitted disease of the cervix.

4.2.4 Respondents' response on Signs of Cervical Cancer

Respondents were asked to indicate some of the signs of cervical cancer and their responses are presented in the table below;

Table 6: Signs of Cervical Cancer

Question	Yes %	No %
Is vaginal discharge sign of cervical cancer?	51.0	49.0
Is bleeding after Menopause sign of CC?	59.3	40.7
Is Irregular menstrual discharge sign of CC?	43.4	56.6
Is Bleeding after coitus sign of CC?	82.1	17.9
Are itching genitalia sign of CC?	13.8	86.2

Source: Survey data (2018)

From the results in the table above, majority of the respondents (51.0%) believed vaginal discharge sign of cervical cancer while 49.0% of the respondents indicated No to the fact that vaginal discharge sign of cervical cancer. As to whether bleeding after menopause is a sign of cervical cancer, 59.3% of the respondents indicated Yes while 40.7% indicated No. 43.4% of the respondents believed irregular menstrual discharge is sign of cervical cancer while another 56.6% said No to that. Most of the respondents (82.1%) indicated that bleeding after coitus is a sign of cervical cancer while 17.9% did not believe it is. Finally, as to whether itching genitalia is a sign of cervical cancer, 13.8% of the respondents indicated Yes while majority (86.2%) indicated No.

4.2.5 Respondents' response on Recommended Age to Administer HPV

The respondents were asked to indicate the recommended age to administer HPV vaccine. The results are presented in table 7.

Table 7: The Recommended Age To Administer HPV Vaccine

Age	Frequency	Percent
Less than 25 years	34	23.4
14 to 35 years	50	34.5
9 to 13 years	51	35.2
More than 45 years	10	6.9
Total	**145**	**100.0**

Source: Survey data (2018)

The results in table 7 shows that, 23.4% of the respondents indicated less than 25 years as the recommended age, 34.5% indicated between 14 and 35 years, majority of the respondents (35.2%) believed it should be between 9 to 13 years, while only 6.9% were of the opinion that it should be more than 45 years.

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4.2.6 Respondents' response on Curability of Cervical Cancer.

The respondents were asked whether cervical cancer is curable or not, their responses are presented in table 8.

Based on the results in table 8, majority of the respondents (74.5%) indicated that cervical cancer can be cured , 16.6% indicated that it doesn't have cure while another 9.0% did not know whether it has cure or not.

Table 8: Opinion on Curability of Cervical Cancer

Response	Frequency	Percent
Yes	108	74.5
No	24	16.6
Don't know	13	9.0
Total	**145**	**100.0**

S**ource:** Survey data (2018)

4.2.7 Respondents' response on Risk Factors of Cervical Cancer

The respondents were asked to indicate some of the risk factors of cervical cancer and their responses are in table 9.

Table 9: Risk Factors of Cervical Cancer

Question	Yes %	No %
Is HPV infection risk factor of CC?	88.3	11.7
Is having many children a risk factor of CC?	18.6	81.4
Is long-term use of contraceptives risk factor of CC?	22.1	77.9
Is early exposure to sex a risk factor of CC?	71.7	28.3
Are multiple sex partners a risk factor of CC?	81.4	18.6
Is poor hygiene a risk factor of CC?	13.8	86.2
Is a family history of CC a risk factor of CC?	78.6	21.4
Is alcohol consumption a risk factor of CC?	24.1	75.9
Is smoking a risk factor of CC?	44.8	55.2

S**ource:** Survey data (2018)

Based on the results in the table above, majority of the respondents believed that HPV infection is a risk factor of cervical cancer, 18.6% of the respondents were of the opinion that having many children is a risk factor of cervical cancer. The results further indicate that 22.1% of the respondents said yes to the statement that long-term use of contraceptives risk factor of cervical cancer, 71.7% of the respondents indicated that early exposure to sex is a risk factor of cervical cancer, while another 81.4% of the respondents believed having multiple sex partners is a risk factor of cervical cancer. Only a small number of the respondents (13.8%) indicated poor hygiene as risk factor off cervical cancer, 78.6% of the respondents felt that family history is a major risk factor of cervical cancer, while 24.1% and 44.8% of the respondents indicated alcohol consumption and smoking respectively as risk factors of cervical cancer.

4.2.8 Respondents' Response on Types of Screening and Prevention Methods

Respondents were asked to indicate the types of screening and prevention methods of cervical cancer they were aware of. Their responses are presented in table 10.

Table 10: Types of Screening and Prevention Methods

Statement	Yes %	No %
Is Lugol's iodine test a screening method	90.3	9.7
Is papanicolaou smear test a screening method?	73.8	26.2
Is acetic acid test a screening method?	69.0	31.0
Is liquid based cytology a CC screening method?	26.2	73.8
Is primary HPV screening a CC test method?	62.1	37.9
Is colposcopy a CC test method?	28.3	71.7
Is HPV vaccination a CC prevention method?	77.9	22.1

S**ource:** Survey data (2018)

From the results in table 10, majority of the respondents (90.3%) of the respondents indicated Lugol's iodine test as a screening method for cervical cancer, 73.8% agreed that papanicolaou smear test is a screening method for cancer while another 69.0% of the respondents seemed convinced that acetic acid test is a screening method for cervical cancer. Further, 26.2%, 62.1% and 28.3% of the respondents indicated liquid based cytology, primary HPV screening and colposcopy respectively as screening methods for cervical cancer. 77.9% of the respondents agreed that HPV vaccination is a prevention method for cervical cancer.

4.2.9 Descriptive on Cervical Cancer Awareness among Healthcare Workers

The table 11 below represents the respondents' responses to statements on competence of healthcare workers;

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Table 11: Cervical Cancer Knowledge (Awareness) among Healthcare Workers

Statement	Strongly Disagree (%)	Disagree (%)	Neutral (%)	Agree (%)	Strongly Agree (%)	mean	SD
Cervical cancer screening is necessary for every sexually active woman	2.80	0.00	0.70	15.20	81.40	4.72	0.74
Cervical cancer screening procedure may not require taking a sample of cells from the cervix	9.70	13.80	1.40	33.10	42.10	3.84	1.36
WHO recommends screening women from 25 years and after every five year intervals	19.30	26.90	11.00	17.90	24.80	3.02	1.49
HPV vaccine should be administered to all sexually active women	11.00	21.40	7.60	33.10	26.90	3.43	1.37
Screening creates a wound which predisposes one to other infections e.g. HIV	45.50	18.60	6.90	14.50	14.50	2.34	1.52
Precancerous lesions in young women can be ignored until later	51.00	31.70	2.80	9.70	4.80	1.86	1.16
Average						**3.20**	**1.27**

Source: Survey data (2018)

Based on the findings in table 11, it is clear that 96.60% (81.40+15.20) of the respondents agreed that they were aware cervical cancer screening is necessary for every sexually active woman, while only 2.80% disagreed. The results had a mean of 4.72 showing that majority of the respondents agreed with the statement however the responses were varied as supported by a standard deviation of 0.74. The respondents were asked to indicated whether they were aware of the fact that cervical cancer screening procedure may not require taking a sample of cells from the cervix; 75.20% agreed while 23.50% disagreed. The results had a mean of 3.84 showing that most of the respondents agreed but the responses were varied as indicated by a standard deviation of 1.36. Concerning the fact that WHO recommends screening women from 25 years and after every five year intervals, majority of the respondents (46.20%) disagreed, while 42.70% agreed. The results had a mean of 3.02 meaning that the respondents were almost neutral about the statement; however the responses were varied as indicated by a standard deviation of 1.49.

The results further showed that, 60.00% of the respondents agreed that they were aware of the fact that HPV vaccine should be administered to all sexually active women, while 32.40% disagreed. The results had a mean of 3.43 showing that majority agreed to the statement however, the

responses were varied as indicated by a standard deviation of 1.37. Respondents were asked whether they were aware that screening creates a wound which predisposes one to other infections e.g. HIV, majority (74.10%) disagreed meaning they were not aware, while 29.00% agreed that they were aware. The results had a mean of 2.34 indicating that majority of the respondents disagreed with the statement but the responses were varied as indicated by a standard deviation of 1.52. Finally, the respondents were asked to indicate if they were aware that precancerous lesions in young women can be ignored until later. 64.10% of the respondents disagreed while only 14.50% agreed. The results had a mean of 1.86 sowing that majority of the respondents disagreed with the statement however the responses were varied as indicated by a standard deviation of 1.16. Important to note in these findings, is the respondent's response on WHO recommended cervical cancer screening frequency for women over 25 years. Majority - 46.2% of the healthcare workers disagreed with the 5 year interval whereas only 42.7% agreed, an indication of wide variation in cervical cancer levels of awareness. Needless to say, this situation is bound to have an impact in their overall efficiency in the fight against cervical cancer.

4.2.10 Descriptive on Attitude and Perceptions

The results in table 12 show the responses of the respondents on the attitude or perception of healthcare workers on cervical cancer. The results are in percentage.

Table 12: Attitude and Perceptions

Statement	Strongly Disagree (%)	Disagree (%)	Neutral (%)	Agree (%)	Strongly Agree (%)	Mean	SD
Cervical cancer is fatal and very little can be done for the patients	40.00	40.00	4.10	6.90	9.00	2.05	1.24
In my facility we are well equipped to manage cervical cancer cases	37.20	38.60	16.60	4.80	2.80	1.97	0.99
Screening procedure is too invasive, uncomfortable, embarrassing and associated with risks of infections	34.50	47.60	9.70	4.10	4.10	1.96	0.99
Diagnosis with cervical cancer is a death sentence since most of the patients cannot afford the high cost of treatment	54.50	24.10	10.30	9.70	1.40	1.79	1.06
Age and sex differences between patients and healthcare workers are not a hindrance to cervical cancer screening practice	11.70	8.30	13.80	36.60	29.70	3.64	1.31
Average						**2.28**	**1.12**

The information in table 12 shows the results on attitude and perception of healthcare works on cervical cancer. The findings show that 80.00 %(40.00%+40.00%) of the respondents disagreed with the statement that Cervical cancer is fatal and very little can be done for the patients, while another 18.90% agreed with the statement. The results had a mean of 2.05 showing that majority of the respondents disagreed with the statement and a standard deviation of 1.24 indicating that the responses were varied. Only 7.60% of the respondents agreed that they were well equipped to manage cervical cancer cases in their facility while majority (75.80%) disagreed. The results had a mean of 1.97 showing that majority disagreed however their responses were varied as indicated by a standard deviation of 0.99.

Concerning the screening procedure, only 8.20% of the respondents agreed that it is too invasive, uncomfortable, embarrassing and associated with risks of infections while majority (82.10%) of the respondents disagreed with the statement. The results had a mean of 1.96 indicating that most of the respondents disagreed but the responses were varied as indicated by a standard deviation of 0.99. Only 20.00% of the respondents agreed with the statement that diagnosis with cervical cancer is a death sentence since most of the patients cannot afford the high cost of treatment, while majority (78.60%) disagreed. The results had a mean of 1.79 meaning that majority of the respondents disagreed with the statement and a standard deviation of 1.06 showing that the responses given by the respondents were varied.

Most of the respondents (66.30%) agreed with the statement that age and sex differences between patients and healthcare workers are not a hindrance to cervical cancer screening practice, while 18.00% disagreed. The results had a mean of 3.64 showing that majority of the respondents agreed with the statement however, the responses were varied as indicated by a standard deviation of 1.31.

In general, the results had an average mean of 2.28 a clear indication that majority of the respondents disagreed with most of the statements however the general responses were varied as indicated by an average standard deviation of 1.12. The results are in agreement with the findings of Jessica, et al. (2016) which showed that, change of attitudes among healthcare workers, and concerted efforts to use existing information on cervical cancer has the potential of influencing their efficiency, and thereby enhance the scalability and effectiveness of prevention programs and control of cervical cancer. These results are further in agreement with those in section 4.3.6 Curability of cervical cancer, where most of the respondents agreed that it is curable. This is indicative of a positive attitude towards cervical cancer prevention and control, an aspect that may enhance their efficacy in the fight against the infirmity. However, majority of them - 75.8% felt that they are ill-equipped to manage cervical cancer. This may affect their resolve and in essence their efficiency in cervical cancer prevention and control. Moreover, the results coincides with findings of Haskins (2016) from her article *Attitudes of Nurses Towards Patient Care at A Rural District Hospital in The Kwazulu-Natal Province of South Africa,* that Poor attitudes of nurses, ensuing in poor care of patients, could harshly undermine their ability and efficiency to provide quality care and improve outcomes for patients.

4.2.11 Descriptive on Technology Usage

The respondents were asked to indicate how technology usage has help in the prevention and control of cervical cancer in their facilities. Their responses were as presented in table 13.

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Table 13: Technology Usage

Statement	Strongly Disagree (%)	Disagree (%)	Neutral (%)	Agree (%)	Strongly Agree (%)	Mean	SD
Our facility is ill-equipped in terms of screening equipment, ICT, internet and information systems for cervical cancer	26.90	17.20	10.30	21.40	24.10	2.99	1.56
Only a few of us are competent in using computers, screening equipment and data systems	8.30	6.20	10.30	33.10	42.10	3.94	1.23
Most of our patients have access to mobile phones which can be used for awareness, health education, reminder alert, and follow-up.	15.20	22.10	6.90	37.20	18.60	3.22	1.38
Health workers' knowledge levels on cervical cancer are up-to-date due to sufficient access to internet and other technological resources	23.40	30.30	18.60	22.80	4.80	2.55	1.21
Healthcare workers use popular technology solutions such as WhatsApp to consult and share clinical experiences	14.50	14.50	6.90	47.60	16.60	3.37	1.32
Average						**3.22**	**1.34**

Source: Survey data (2018)

Table 13 presents the responses of the respondents on Technology Usage as a way of preventing and controlling cervical cancer. 45.50% of the respondents agreed that their facility is ill-equipped in terms of screening equipment, ICT, internet and information systems for cervical cancer while 44.10% disagreed with the statement. Concerning the competence in usage of computer and screening equipment, 75.20% of the respondents agreed that only a few of them were competent in using computers, screening equipment and data systems, while another 14.50% disagreed. 55.80% of the respondents agreed that Most of their patients had access to mobile phones which could be used for awareness, health education, reminder alert, and follow-up, while 37.30% disagreed.

Concerning the level of knowledge of healthcare workers on cervical cancer, 27.60% of the respondents agreed that health workers' knowledge levels on cervical cancer was up-to-date due to sufficient access to internet and other technological resources, while majority(53.70%) disagreed with the statement. Finally, most of the respondents (64.20%) agreed with the statement that healthcare workers use popular technology solutions such as WhatsApp to consult and share

clinical experiences, while 29.00% of the respondents disagreed. The results had an average mean of 3.22 and average standard deviation of 1.34 showing that most of the respondents agreed with most of the statements however the responses were varied.

These results are in agreement with a conclusion made by Owuor (2017) that technology can be used successfully to improve healthcare workers efficiency in the fight against cervical cancer. He concluded that, technology has been highly utilized in the area of cervical cancer control by the western countries to enhance patience follow-up, timely service delivery and accuracy of information. Likewise in these results, the respondents confirmed their inadequacy and therefore inefficiency due to lack of training and skills in using computers, screening equipment and data systems. Ordinarily, this has a negative effect on healthcare workers efficacy in prevention and control of cervical cancer.

4.2.12 Descriptive on Cervical Cancer Prevention and Control

The results in table 14 show the responses of the respondents on cervical cancer prevention and control.

Table 14: Cervical Cancer Prevention and Control

Statement	Strongly Disagree (%)	Disagree (%)	Neutral (%)	Agree (%)	Strongly Agree (%)	Mean	SD
There has been tremendous reduction in cervical cancer cases being reported in our facility.	14.50	13.10	10.30	53.80	8.30	3.28	1.23
Many cervical cancer patients have been screened over the last 5 years as a result of the introduction of modern screening equipment and use of technology	12.40	9.00	11.00	52.40	15.20	3.49	1.22
Due to awareness about cervical cancer, many cases have been discovered and treated at earlier stages.	13.80	13.10	15.20	47.60	10.30	3.28	1.23
As a result of the increased knowledge about cervical cancer, many cervical cancer patients are no longer embarrassed about their status and so can easily seek treatment in public health centres.	15.20	11.00	10.30	51.70	11.70	3.34	1.27
Health centres within Machakos county are conducting free cancer screening which has led to a significant reduction in cervical cancer cases in the County.	7.60	9.70	12.40	55.90	14.50	3.60	1.09
Average						**3.40**	**1.21**

The results in table 14 shows that 62.10% (53.80+8.30) of the respondents agreed that there has been tremendous reduction in cervical cancer cases reported in their facility, while another 27.60% disagreed. The results had a mean of 3.28 implying that majority of the respondents agreed with the statement however the responses were varied as indicated by a standard deviation of 1.23. Majority of the respondents (76.60%) agreed that many cervical cancer patients have been screened over the last 5 years as a result of the introduction of modern screening equipment and use of technology, while another 21.40% disagreed. Concerning discovery and treatment of cervical cancer, majority of the respondents agreed that due to awareness about cervical cancer, many cases have been discovered and treated at earlier stages while 26.90% disagreed with the statement. 63.40% of the respondents agreed that, as a result of the increased knowledge about cervical cancer, many cervical cancer patients are no longer embarrassed about their status and so can easily seek treatment in public health centres, however 26.20% disagreed with the statement.

Finally, 70.40% of the respondents agreed that health centres within Machakos County were conducting free cancer screening which led to a significant reduction in cervical cancer cases in the County, another 17.30% of the respondents disagreed with the statement. The results had an average mean of 3.40 showing that generally most of the respondents agreed with the statements however, the responses were varied as indicated by a standard deviation of 1.21.

These results are consistent with the findings of DeBlois & Millefoglie (2015) who asserted that, cervical cancer is a serious issue in women's health, and prevention strategies need to be enhanced, such as human papilloma virus (HPV) vaccination and screening programs. Proper collection, storage and retrieval of data and information so gathered is critical for these interventions to have an impact. This calls for the need to improve healthcare workers skills and competence in order for them to be sufficiently equipped for this battle. A change of attitude amongst the care givers is equally imperative so as to enhance their efficiency in the fight against cervical cancer.

4.3 Correlation Analysis

Table 15 below presents the results of the correlation analysis.

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Table 15: Correlation Matrix

		Prevention and Control	Training	Knowledge	Attitude	Technology
Prevention and Control	Pearson Correlation	1.000				
	Sig. (2-tailed)					
Training	Pearson Correlation	.542**	1.000			
	Sig. (2-tailed)	0.000				
Knowledge	Pearson Correlation	.683**	.668**	1.000		
	Sig. (2-tailed)	0.000	0.000			
Attitude	Pearson Correlation	.567**	.871**	.779**	1.000	
	Sig. (2-tailed)	0.000	0.000	0.000		
Technology	Pearson Correlation	.675**	.667**	.882**	.870**	1.000
	Sig. (2-tailed)	0.000	0.000	0.000	0.000	

Source: Survey data (2018)

The results in table 15 revealed that training of health workers and prevention and control of cervical cancer are positively and significantly associated (r=0.542, p=0.000), the table further indicated that knowledge about cervical cancer and prevention and control are positively and significantly associated (r=0.683, p=0.000). Similarly, results showed that the attitude and perception about cervical cancer and prevention and control were positively and significantly associated (r=0.567, p=0.000). Finally, according to the results, technology usage and prevention and control of cervical cancer are positively and significantly associated(r=0.675, p=0.000). This implies that an improvement in training of health workers, knowledge (awareness) about cervical cancer, positive change of attitude and perception about the disease, and increased use of technology leads to an improvement in efficiency of healthcare workers towards prevention and control of cervical cancer.

These correlation results are consistent with the conclusion made by Jessica, et. al. (2016) that, cervical cancer has been a big challenge due to various factors ranging from stigma and therefore attitudes associated with cancer, awareness, cost and coverage, scarce oncology specialist, diagnostics and treatment availability as well as poor health information and data systems.

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4.4 Regression Analysis

The results presented in table 16 present the fitness of model used of the regression model in explaining the study phenomena.

Table 16: Model Fitness

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.692[a]	.562	.433	.60672

a. Predictors: (Constant), Technology, attitude, knowledge, training.

S**ource:** Survey data (2018)

From the results on table 16, training, knowledge, attitude and technology were found to be satisfactory variables in explaining prevention and control of cervical cancer in Machakos County. This fact is supported by coefficient of determination R square of .562. This means that training, knowledge, attitude and technology explain 56.2% of the variations in the dependent variable, which is prevention and control of cervical cancer. In statistics, significance testing the p-value indicates the level of relation of the independent variable to the dependent variable. If the significance number found were less than the critical value also known as the probability value (p) which is statistically set at 0.05, then the conclusion would be that the model is significant in explaining the relationship; else, the model would be regarded as non-significant.

The results are consistent with the findings by KDHS (2014) which indicated that, incidences of invasive Cervical Cancer have declined steadily over the years in Kenya. The decline can primarily be attributed to increased use of data and information by healthcare workers in the fight against the vice. This has been possible through systematic enhancement of healthcare worker's oncology proficiency, skills and capacity, awareness, attitudes and perceptions, and use of technology.

Table 17 gives the outcomes on the examination of the difference (ANOVA).

Table 17: Analysis of Variance

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	18.595	4	4.649	79.629	.000[b]
Residual	32.762	89	.368		
Total	**51.357**	**93**			

a. Dependent Variable: Prevention and control

b. Predictors: (Constant), Technology, attitude, knowledge, training.

The outcomes of the analysis of variance show that the general model was statistically significant. Further, the outcomes suggest that Technology, attitude, knowledge, training are good indicators of prevention and control of cervical cancer. This was supported by an F statistic of 79.629 and the reported p value (0.000) which was less than the conventional probability of 0.05 significance level.

The regression of coefficient table is presented in Table 18.

Table 18: Regression of Coefficient

Model	**Unstandardized Coefficients**		**Standardized Coefficients**	**t**	**Sig.**
	B	**Std. Error**	**Beta**		
(Constant)	1.181	.262		4.510	.000
Training	.275	.0147	.087	18.71	.008
Knowledge	.199	.074	.227	2.689	.015
Attitude	.260	.103	.286	2.524	.023
Technology	.243	.099	.052	2.455	.003

a. Dependent Variable: Prevention and Control

S**ource:** Survey data (2018)

Regression of coefficients results in Table 18 shows that Training of healthcare workers and prevention and control of cervical cancer are positively and significant related (β=.275, p=0.008). The table also indicated that Knowledge (awareness) among the healthcare workers and prevention and control of cervical cancer are positively and significantly related (β=.199, p=0.015). Similarly, results showed that the attitude/perception of healthcare workers and prevention and control of cervical cancer were positively and significantly related (β=.260 p=0.023). The results further showed that, Technology usage and Prevention and Control of cervical cancer were positively and significantly related (β=.243 p=0.003). This implies that an improvement in training of health workers, awareness about cervical cancer, change of attitude and technology usage leads to healthcare workers efficiency in Prevention and Control of cervical cancer.

Moreover, these regression analysis results are consistent with the findings of Kress C.M (2015) in her article *Knowledge, attitudes and practices regarding cervical cancer and screening among Ethiopian healthcare workers*, where barriers to healthcare workers efficacy in prevention and control of cervical cancer were identified as lack of training, inadequate resources (screening equipment and facilities), as well as low cervical cancer awareness. The study concluded that there is great need for more education for healthcare providers on etiology, cervical cancer risk factors, screening methods, equipment and technologies. Further the study highlighted the need to improve existing health centre infrastructure to compliment healthcare workers in enhancing their efficiency in prevention and control of cervical cancer.

5.0 CONCLUSION

From the findings, it can be concluded that training of healthcare workers positively and significantly impacts on their efficiency towards prevention and control of cervical cancer. Lack of proper knowledge or training among healthcare workers is a serious challenge in the fight against cervical cancer especially in Kenya. When healthcare providers are well trained on matters of cervical cancer, they will be able to effectively take up the role of fighting against cervical cancer by utilizing the available resources at their disposal in aiding the prevention and control of the disease.

It can also be concluded that cervical cancer awareness or knowledge affects efficiency of healthcare workers and the fight against cervical cancer. When cervical cancer facts and figures are on the figure tips of healthcare workers, they are able to educate the public correctly and confidently and thereby enlightening them on the dangers and control measures of cervical cancer. In so doing, many cancer patients are able to seek treatment early before the damage is done. This leads to improvement in fight against cancer.

It can further be concluded that, attitude or perception of healthcare workers plays an important role in the fight against cervical cancer. When healthcare providers have negative attitude towards cervical cancer screening procedures and against the patients, many cervical cancer patients get discouraged, stigmatized and are forced to shy away from seeking treatment. This is detrimental to the fight against the disease. On the other hand, when healthcare providers have positive attitude towards the screening procedures and towards the patients, it makes it easy for the public to go for screening services where available.

Finally, based on the findings, it suffices to conclude that technology solutions enhances healthcare workers efficiency in prevention and control of cervical cancer. It thus plays a vital role in the prevention and control of cervical cancer. Technology has been highly utilized in the fight against cervical cancer by the western countries to enhance patience follow-up, timely delivery and accuracy of information. Increasingly and lieu of the awareness, training and healthcare worker's attitude, technology can be deployed to enhance their efficiency in cervical cancer prevention, care and control in Machakos, Kenya

6.0 RECOMMENDATIONS

Based on the findings of this study, Health care facilities should encourage their healthcare providers to take regular refresher causes on prevention and control of cervical cancer.

There should be deliberate efforts to create cervical cancer awareness among healthcare workers. Health-centres and respective stakeholders need to consider ways and means of incentivizing healthcare workers in order for them to remain efficient in the fight against cervical cancer. Likewise, healthcare workers need to take personal initiatives and remain abreast with the latest developments and interventions on cervical cancer if this war is to be won.

Moreover, it is important for nurses to have positive attitudes towards patients and patient care if good quality care is to be provided. As a result, it is recommended that all health centres assess attitudes of healthcare workers regularly to ensure that patient care is not compromised.

Finally, the use of technology should be adopted by all the stakeholders involved in cervical cancer prevention and control. The same has been utilized in the western countries and has posted very good results on the war against cervical cancer.

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