OUTCOME EVALUATION OF OUTREACH SCREENING PROGRAM COMPARED TO FACILITY BASED SCREENING ON EARLY DETECTION, TREATMENT AND SURVIVAL RATE OF CERVICAL CANCER PATIENTS AT OCEAN ROAD CANCER INSTITUTE IN TANZANIA

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By

Joha Kibira

A dissertation Submitted in (Partial) Fulfillment of the requirement for the degree of Masters of Science in Project Management, Monitoring and Evaluation in Health of Muhimbili University of Health an Allied Sciences

October, 2024

CERTIFICATION

The undersigned certify that they have read and hereby recommended for acceptance to Muhimbili University of Health and Allied Sciences a dissertation report entitled "**OUTCOME EVALUATION OF OUTREACH SCREENING PROGRAM COMPARED TO FACILITY BASED SCREENING ON EARLY DETECTION, TREATMENT AND SURVIVAL RATE OF CERVICAL CANCER PATIENTS AT OCEAN ROAD CANCER INSTITUTE IN TANZANIA,"** in partial fulfilment of the requirements for the degree of Masters of Science in Project Management, Monitoring and Evaluation in Health of Muhimbili University of Health an Allied Sciences.

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Date

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(Co-supervisor)

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Date

DECLARATION AND COPYRIGHT

I, **Joha Kibira** hereby declare that this **dissertation** is my original work and that it has never been presented and will not be presented to any other university for a similar or any other degree award.

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DEDICATION

I dedicate this work to my lovely late Mother (Amina), my lovely Family Husband (Shwaib Yusuf), Children (Faheemah Shwaib and Farhan Shwaib) for their unconditional love, support and prayers during the whole process of achieving this work. I have encountered ups and down but throughout the time you were by my side.

ABSTRACT

Background: Cancer screening can improve individual outcome by detecting cancer at early stages. Unfortunately access to screening services is limited due to lack of awareness and knowledge, availability of limited screening facilities and health providers and geographical barriers.

Objective: To determine early detection, early treatment and survival rate of cervical cancer patients at Ocean Road Cancer Institute comparing of outreach screening program to facility-based screening.

Methods: The study employed analytical retrospective cohort study design using secondary data on cervical cancer screening programs and treatment records extracted from ORCI database. The study population included 6,165 cervical cancer patients who were screened by ORCI, 2,803 from outreach program and 3,362 from facility and subsequently showed up for treatment within the period of one year from January 2020 to December 2020 and then followed for three years, from January 2020 to December 2023. Regression statistical used to examine the association between soci-demographic factors and utilization of cervical cancer screening.

Results: The study found that facility-based screening detected slightly higher cervical cancers in early stage (62.5%) than outreach programs (62.1%), and women screened at facilities were much more likely to seek treatment (90.4%). The study also indicated that Women aged 30-45(AOR=1.71, 95% CI=1.51, 1.94) and 46-60 (AOR=1.32, 95% CI=1.07, 1.63) had higher odds of utilizing cervical cancer screening services at facility level than those with below 30 years and also women with primary education (AOR=2.44, 95% CI=2.08, 2.86), secondary education (AOR=8.15, 95% CI=6.76, 9.82) and higher education (AOR=17.10, 95% CI=4.99, 58.54) had higher odds of utilizing cervical cancer screening services at facility level compared to those with informal education. A concerning finding was the decline in survival rates, particularly for women detected through outreach, where among 16 women that were enrolled in 2020, 81.25% followed by 69.23% and finally 66.66% in 2021, 2022 and 2023 consecutively, this highlighting the need for further research into these barriers.

Conclusion and recommendations: According to the study findings, outreach screening programs can be useful in identifying cases of cervical cancer, particularly those that are detected early. On the other hand, people screened at the facility were far more likely to seek treatment. Study suggests ensure accurate and complete data collection on cervical cancer cases, including stage at diagnosis, treatment received, and survival outcomes, while collaborate with local NGOs, community leaders, and faith-based organizations to reach underserved populations for outreach programs and education initiatives.

TABLE OF CONTENTS

CERTIFICATION i
DECLARATION AND COPYRIGHT ii
ACKNOWLEDGMENT iii
DEDICATION iv
ABSTRACT vi
LIST OF TABLES x
LIST OF FIGURES x
ABBREVIATIONS xi
DEFINITION OF TERMS xii
CHAPTER ONE 1
1.0 INTRODUCTION 1
1.1 Background 1
1.2 Statement of the problem 3
1.3 Conceptual framework 4
1.4 Rationale of the study 5
1.5 Research questions 7
1.5.1 Main research question 7
1.5.2 Specific research questions 7
1.6 Research Objectives 8
1.6.1 Broad Objective 8
1.6.2 Specific Objectives 8
CHAPTER TWO 9
2.0 LITERATURE REVIEW 9
2.1 Impact of outreach screening program on detection of cervical cancer cases compared to facility-based screening 9
2.2 Distribution of cervical cancer cases by stage among detected through outreach screening compared to facility-based screening 9

2.3 Seeking for initial treatment after detection through outreach screening program and facility 10
2.4 Survival rate of cervical cancer patients 10
2.5 Social demographic factors associated with utilization of cervical cancer screening 11
CHAPTER THREE 13
3.0 MATERIAL AND METHODS 13
3.1 Study design 13
3.2 Study area 13
3.3 Study population 13
3.4 Sample size estimation 14
3.5 Inclusion criteria 14
3.6 Exclusion criteria 14
3.7 Variables 14
3.8 Data collection methods 16
3.9 Data management and analysis 16
3.10 Data analysis 17
3.11 Ethical consideration 17
CHAPTER FOUR 18
4.0 STUDY FINDINGS 18
4.1 Social demographic characteristics of participants for outreach and facility screening programs 18
4.2 Number of cervical cancer cases detected 19
4.3 Distribution of the cervical cancer cases detected by stage 20
4.4 Cervical cancer patients seeking treatment at ORCI 21
4.5 Cervical cancer patients' survival 22
4.6 Determinants for utilization of cervical cancer screening program through outreach and facility 23
CHAPTER FIVE 25
5.0 DISCUSSION 25

5.1 Introduction 25
5.2 Cervical cancer cases detected 25
5.3 Stage of cervical cancer detection 25
5.4 Cervical cancer patients seeking treatment at ORCI 26
5.5 Cervical cancer patients' survival 27
5.6 Determinants of utilization of cervical cancer screening program through outreach and facility 27
5.7 Study limitations 28
CHAPTER SIX 30
6.0 CONCLUSION AND RECOMMENDATIONS 30
6.1 Conclusion 30
6.2 Recommendations 30
REFERENCES 32
APPENDICES 41
APPENDIX I: Data Collection Tool 41
APPENDIX II: Ethical Clearance 43

LIST OF TABLES

Table 1: Distribution of social demographic characteristics across the utilization of cervical cancer screening programs through outreach and facility (n=6165) 19
Table 2: Logistic regression results of utilization of cervical cancer screening program through outreach and facility and the socio-demographic characteristics 24

LIST OF FIGURES

Figure 1: Number of cervical cancer cases detected 20
Figure 2: Distribution of the cervical cancer cases detected by stages 20
Figure 3: Cervical cancer patients seeking treatment at ORCI 21
Figure 4: Cervical cancer patients' survival 23

ABBREVIATIONS

DNA – Deoxyribonucleic Acid

HIV – Human Immunodeficiency Virus

HPV – Human Papilloma Virus

IRB – Institutional Review Board

LMICs – Low-and Middle-Income Countries

MoH – Ministry of Health

MUHAS – Muhimbili University of Health and Allied Science

NGOs – Non Governmental Organization

ORCI – Ocean Road Cancer Institute

STI – Sexually Transmitted Infections

WHO – World Health Organization

FIGO - International Federation of Gynecology and Obstetrics

DEFINITION OF TERMS

Cervical cancer is cancer that starts in the cells of the cervix. The cervix is the lower, narrow end of the uterus (womb) (1).

Cancer screening is looking for cancer before symptoms appear, when cancer may be easier to treat (1).

Pap smear is a test to look for cancers and pre cancers in the cervix. Pre cancers are cell changes that can be caused by HPV (2).

Outreach screening is to bring basic health screening and educational resources to underserved or high risk population with the goal of identifying potential health problems early, when they are easier to treat and manage (3).

HPV is a sexual transmitted infection (STI) that when it's not treated well can cause cervical cancer (4).

Survival rate is a percentage or proportion of people diagnosed with a specific disease who are still alive after a certain period (5).

HPV test looks for DNA from HPV in cells from your cervix (6).

CHAPTER ONE

1.0 INTRODUCTION

1.1 Background

Cervical cancer is the second most common cancer among women in the world. The burden of cervical cancer incidence and mortality is rapidly growing(7). According to WHO cancer accounted for nearly 10 million deaths with estimates of about 19.3 million new cases in 2020. Each year, 5 million people in low and middle income countries (LMICs) die from cancer which is about 10% of the 50 million deaths occurring in these countries (8). Furthermore, among the most common cancer in women, cervical cancer is ranked fourth, and in each year it causes over 341,831 deaths worldwide with 604,127 new cases annually (9).

In sub-Saharan Africa, the high incidence rate and mortality linked to cervical cancer are mainly due to the absence of effective preventive programs in the region(10). Prioritizing comprehensive and easily accessible healthcare services, such as screenings, options for treatment, and vaccination programs, is essential to reducing the prevalence of cervical cancer and lowering its impact on women in East Africa and sub-Saharan Africa(11) . In 2020 about 801,392 new cancer cases and 520,158 cancer deaths were estimated to occur in the region (12). The high incidence rates and late presentation of cervical cancer in Sub-Saharan are due to a lack of coordinated and organized pathways in cancer control in the area of prevention, diagnosis, and treatment (13). Cancer prevention interventions through health education on lifestyle modification, preventive immunization, and screening have demonstrated a decline in cancer incidence and mortality in developed countries, particularly in cervical cancer (14). The majority of cervical cancer cases can be prevented by the introduction of effective screening programs as secondary prevention method and Human Papilloma Virus vaccination as primary prevention method. Several studies have proven a reduction in the incidence of cervical cancer by about 70-90% in developed countries through those prevention methods (15).

Tanzania has a population of about 18.8 million women aged 15 and above who are at risk of developing cervical cancer (16). Current estimates indicate that 10,241 women are diagnosed

with cervical cancer every year and 6,525 die from this disease(16). Cervical cancer ranks as the 1st frequent cancer in Tanzanian women. Furthermore, a year's chance of surviving with cervical cancer is less than 21% with the majority of cases presenting at an advanced stage of disease and hence jeopardize the success of treatment (17).

Ocean Road Cancer Institute located in Dar es Salaam is the only specialized cancer treatment center in Tanzania. It provides screening programs for women through two methods; routine facility-based screening and screening at outreach sites that are located in the majority of the regions of Tanzania (15). Unfortunately access to screening services as secondary prevention method is limited due to lack of awareness and knowledge, availability of limited screening facilities and health providers and geographical barriers (18).

Facility-based cervical cancer screening is the process of conducting cervical cancer screenings at healthcare facilities such as hospitals, clinics, or specialized screening centers. This approach involves women visiting the facility to receive a Pap smear or HPV test, which are the commonly used screening methods for cervical cancer. Facility-based screening can be integrated with other healthcare services like routine checkups of Obstetrics and gynecology diseases (19). Also due to facility-based screening, immediate access to resources and healthcare providers at facilities can facilitate quick follow-up and initiation of treatment for confirmed cases (20).

Outreach screening for cervical cancer involves bringing the screening services directly to the community, rather than requiring women to visit healthcare facilities. This approach often involves setting up temporary screening camps in community and provide awareness campaigns, distribute educational materials, and refer women for screening. Several studies have shown that outreach programs can overcome logistical and financial barriers that prevent women from attending facility-based screening but also outreach programs can raise awareness about cervical cancer and screening importance within communities, leading to higher levels of acceptance and participation(21).

This study evaluates the outcome of the outreach screening, particularly on its outcomes in term of early detection, early treatment and survival rate of the cervical cancer patients. The findings of this study inform future strategies for cervical cancer screening, aiming to improve outcomes and reach a larger at-risk population.

1.2 Statement of the problem

The human papillomavirus (HPV), is the most prevalent viral infection of the reproductive tract. The virus increases the risk of cervical cancer in women of reproductive age (11). In East Africa, Tanzania is ranked second in the region with cervical cancer being the primary cause of cancer-related deaths in women (22). More than half of the women with cervical cancer, die because of late diagnoses (11).Despite advances in medical science, cervical cancer remains a significant public health issue, especially among populations with limited access to healthcare facilities(23). Facility-based screening programs have shown effectiveness in early detection and treatment of cervical cancer; however, they rely heavily on women's ability to visit healthcare centers, which can be hindered by various socioeconomic and logistical barriers. This gap necessitates an alternative approach to improve screening uptake and early intervention. Previous studies show that, outreach screening for cervical cancer has the potential to address these barriers by bringing screening services directly to communities(24).

Ocean road cancer Institute located in Dar es Salaam is the only specialized cancer treatment hospital in Tanzania. (25). In the year 2002 Ocean Road Cancer Institute introduced a screening program for cervical cancer and since then cervical cancer screening has been done as a routine service that is offered free of charge (12). However, due to limited access to cervical cancer screening for high-risk women whose majority are residing in rural settings, the Institute increased cervical cancer screening coverage through outreach programs, by putting an effort to decentralize screening services at the regional and district levels where by the Institute attends to over 15,000 clients yearly in the outreach programs in Tanzania regions (15). However, there is no systemic study that has been done to assess the effectiveness of this program on reducing the burden of disease by detecting cervical cancer at an early stage, early treatment, and survival rates of patients.

Therefore, the study aims to assess the outcomes of the outreach screening program for cervical cancer, specifically focusing on early detection, accessibility and timeliness of treatment and increasing the survival rates. This study also examined the potential factors that may have influenced the utilization of the outreach screening program, such as age, educational level and occupation.

1.3 Conceptual framework

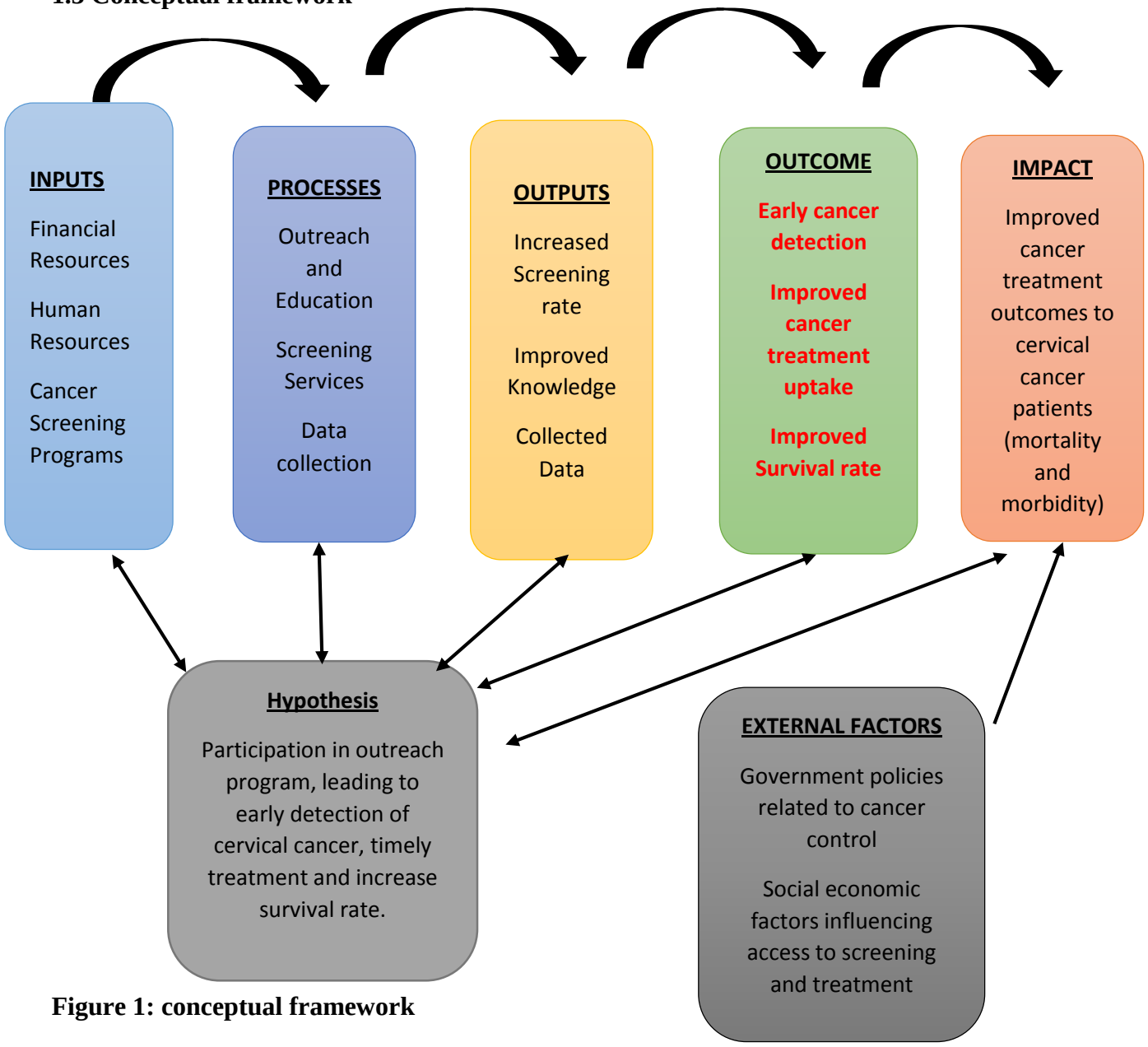


Figure 1: conceptual framework

This conceptual framework adapt the idea of the theory of change which is a popular framework for outcome and impact assessment (26). It is a model which help to show a roadmap to the steps needed to achieve a desired outcome. Inputs are the resources and inputs required for the cervical cancer screening programs. Processes, these are the activities and interventions undertaken to implement the screening programs. Outputs, these are the immediate results or products of the screening programs which include, Increased Screening Rate, improved Knowledge, and collected Data. Outcome, this is the desired result or impact of the screening programs which include, early Cancer Detection, improved Cancer Treatment uptake:, and improved Survival Rate. Impact, this is the long-term effect of the screening programs on cervical cancer outcomes and the overall health of the population. Lastly there are hypothesis and External factors: These are factors outside of the program that can influence its effectiveness such as Government Policies Related to Cancer Control and Social economic factors influencing access to screening and treatment.

By looking the relationship between variables which are outreach cancer screening program and facility based screening program (independent variable) and detected cases, treatment uptake and survival rate (dependent variables) the framework outlines the inputs, activities, outputs, outcomes and impact. And because, this is an outcome evaluation study the main focus is an outcome part of the whole framework, other parts show the relationship of the theory. The framework also identifies causal pathways, hypothesis and external factors related to this study.

1.4 Rationale of the study

This study aims to evaluate the effectiveness of outreach cervical cancer screening program in terms of their outcomes on early detection rates, accessibility to treatment, and overall survival rates of cervical cancer patients. The study will provide evidence on the value of outreach programs in reaching the targeted population and emphasize population to seek for treatment. This evaluation is crucial as it will provide valuable insights into the impact of the outreach screening program and whether it is effectively addressing the social demographic factors to early detection and treatment of cervical cancer. The findings of this study contribute to strengthening the evidence base for outreach cervical cancer screening program as a key strategy

to address disparities in cervical cancer outcomes. Lastly, the study justification suggests that, it has the potential to make significant contributions to the field of cervical cancer prevention and control by providing evidence on the outcome of outreach programs, addressing disparities, and informing policy decisions.

1.5 Research questions

1.5.1 Main research question

What is the outcome outreach screening program for cervical cancer patients at Ocean Road Cancer Institute in terms on early detection, early treatment and survival rate compared to facility-based screening?

1.5.2 Specific research questions

1. What are the number of cervical cancer cases detected through the outreach program and those detected through facility-based screening from January 2020 to December 2020?
2. What are the distribution of cervical cancer cases by stage among those detected through outreach program and facility-based screening from January 2020 to December 2020?
3. What is the proportion of cervical cancer patients who started treatment after detection through the outreach program compared to those diagnosed at the facility from January 2020 to December 2020?
4. What is the proportion of survival among cervical cancer patients who have been detected through the outreach program compared to those diagnosed at the facility-based screening from January 2020 to December 2023?
5. What are the social demographic factors associated with utilization of cervical cancer screening program through outreach and facility?

1.6 Research Objectives

1.6.1 Broad Objective

To assess the outcome of outreach screening program on early detection, early treatment and survival rate of cervical cancer patients at Ocean Road Cancer Institute compared to facility-based screening.

1.6.2 Specific Objectives

1. To determine the number of cervical cancer cases detected through the outreach screening program and those detected through facility based screening from January 2020 to December 2020.
2. To determine the distribution of cervical cancer cases by stage among those detected through facility-based screening from January 2020 to December 2020
3. To determine proportion of cervical cancer patients who started treatment after detection through the outreach program compared to those diagnosed at the facility-based from January 2020 to December 2020.
4. To determine the proportion of survival among cervical cancer patients who have been detected through the outreach program compared to those diagnosed at the facility-based screening from January 2020 to December 2023.
5. To determine the social demographic factors associated with utilization of cervical cancer screening program through outreach and facility.

CHAPTER TWO

2.0 LITERATURE REVIEW

2.1 Impact of outreach screening program on detection of cervical cancer cases compared to facility-based screening

Studies have consistently shown that cervical cancer screening programs can significantly improve treatment outcomes. These programs have been effective in increasing screening rates, facilitating timely follow-up, and enhancing access to diagnostic services. For example, Dignan's study demonstrated a significant increase in cervical cancer screening through outreach programs(27).

Additionally, outreach programs have proven successful in improving treatment outcomes for women. Strategies such as integrating educational programs, on-site screening, and diagnostic services in mobile clinics have been shown to be effective (28). A study conducted in Uganda in 2020 further supports this, revealing that more people were screened for cervical cancer in outreach settings compared to hospitals(28). Outreach screening programs for cervical cancer patients have a positive impact on improving treatment outcomes(29). Therefore, this study look on screening methods, both outreach and facility-based on detecting cervical cancer cases.

2.2 Distribution of cervical cancer cases by stage among detected through outreach screening compared to facility-based screening

When cervical cancer is diagnosed by Pap smear or HPV test, more test is done to determine how far the cancer has spread, and this is called staging (30). The stage of cervical cancer describe a cancer based on how much cancer spread in the body and where it is when first diagnosed. According to International Federation of Gynecology and Obstetrics (FIGO) staging system stratified cervical cancer stages in to four stages for the aim of planning treatment and estimate the outcome (31). In stage I, the cancer found only in cervix, in stage II cancer spread beyond cervix, stage III cancer spread within pelvis and stage IV cancer has spread to bladder,

rectum or other part of the body (32). In cervical cancer stage I and II refer as early detection (33).

Studies have revealed that a significant proportion of cervical cancer cases in India and Ethiopia are diagnosed at advanced stages, emphasizing the importance of effective screening programs(34) (35). Research has highlighted disparities in cervical cancer outcomes based on the stage at diagnosis, with screening being more effective at preventing death from cancer than preventing it (36).

In Tanzania, a high percentage of women with cervical cancer present in advanced stages, underscoring the need for improved educational programs and screening initiatives (37). This study aims to address the distribution of cervical cancer stages among cases detected through outreach screening versus facility-based screening to improve outcomes and reduce mortality.

2.3 Seeking for initial treatment after detection through outreach screening program and facility

This study aims to compare the effectiveness of outreach and facility-based screening programs in identifying cervical cancer patients who seek treatment as their initial point of care. A particular area of interest is the proportion of patients who seek treatment after being detected through outreach programs compared to those detected through facility-based screening(21). The outreach screening program has emerged as a method to improve early detection and treatment of cervical cancer in underserved populations. Previous research suggests that the outreach screening program may be effective in identifying a higher cervical cancer patients who seek treatment care compared to facility-based screening (38).

However, this study specifically compares the treatment-seeking behavior of patients detected through both methods. This comparison is important for understanding the relative outcome of these two approaches in improving early detection and treatment of cervical cancer in underserved populations.

2.4 Survival rate of cervical cancer patients

Despite huge advancement, cervical cancer remains a major cause of morbidity and mortality in low-and middle-income countries where effective screening programs are lacking. A review

of cervical cancer screening found that outreach screening and mobile are effective in promoting survival rate(39). In the study done in China from 1989 to 2018, indicated that organized cervical screening projects help to identify the potential patients(40). Early detection through screening is crucial, as mortality increases with disease incidence, highlighting the need for improved screening coverage and increased awareness among women(40).

HPV screening has been shown to significantly reduce the risk of dying from cervical cancer. A single screening after age 35 can decrease this risk by up to 70% (41).

In Tanzania, literature demonstrated that more screened women had stage 1 disease (14.0%) than unscreened women(42).The study done by A.C. Gard in 2014 show most women referred from screening completed their treatment for their cancer at ORCI(42). Given the positive impact of screening on survival rates, this study aims to compare the survival outcomes of patients detected through outreach and facility-based screening programs.

2.5 Social demographic factors associated with utilization of cervical cancer screening

Early detection through screening is crucial for reducing mortality and improving treatment outcomes. However various social demographic factors can influence participation in cervical screening, leading to disparities in disease burden and survival rates. These disparities can be attributed to various factors including age, education level, geographic location and occupation.

In the study conducted in Zimbabwe on social demographic inequities in cervical cancer screening, treatment and care among women aged 25 years revealed that residence, education, occupation and income were not associated with cervical cancer screening and treatment (43).

Another study conducted in Ethiopia about the cervical cancer screening utilization and associated factors among women, shows that older age and being employed utilize the most the cervical cancer screening (44).

However, other study shows that approximately 88% of all death caused by cervical cancer occur in low resources countries and about 1.3% died from disease before the age of 75 years(45).

Additionally, a study in Tanzania highlighted the importance of distance to screening services as a factor influencing utilization. Approximately 88% of all cervical cancer deaths occur in low-income countries, and 1.3% of women die before age 75 (46). These findings emphasize the need to address social demographic inequities and improve access to cervical cancer screening services to reduce mortality and improve outcomes.

CHAPTER THREE

3.0 MATERIAL AND METHODS

3.1 Study design

This is an outcome evaluation study, which employed an analytical retrospective cohort study design using a quantitative approach to collect and analyse secondary data on cervical cancer screening programs and treatment records extracted from ORCI database. An Outcome evaluation is a critical component of any program or intervention because it identifies areas for improvement, informs decision-making and for accountability to stakeholders, funders, and the public. An analytical retrospective cohort study is a valuable research design because it effects existing data, such as medical records or databases, which can be more efficient and cost-effective than collecting new data.

3.2 Study area

Ocean Road Cancer Institute (ORCI) is the national specialized cancer hospital located in Dar es Salaam, Tanzania. The Institute serves more than 50,000 patients per year that include about 28,000 cancer patients, 10,000 cancer screening patients and attends to over 15,000 clients in the outreach program in the Tanzania regions. ORCI is where the screening programs are conducted and where cervical cancer patients receive treatment. This study will also involve geographic regions served by outreach programs done by ORCI from January 2020 to December 2020.

3.3 Study population

The study population included cervical cancer patients who participated in the screening program through both outreach screening program which included six regions (Dodoma, Rukwa, Katavi, Arusha, Tanga and Iringa) and facility-based and subsequently received treatment at ORCI within the period of one year from January 2020 to December 2020 and then followed for three years, from January 2020 to June 2023.

3.4 Sample size estimation

This study employed total population sampling as the study including 6165 patients who were all the newly diagnosed cases of cervical cancer obtained through both screening ways; outreach program and facility-based, and get treatment at ORCI between January 2020 to December 2020 and followed up to December 2023. The sample obtained from cancer registry database. To address selection bias, I conducted a detailed descriptive analysis of the study population to identify any potential imbalances in terms of demographic characteristics, disease severity and access to healthcare.

3.5 Inclusion criteria

Women who participated in the screening programs conducted by ORCI and were identified with cervical cancer, then received or are receiving treatment at ORCI.

3.6 Exclusion criteria

Cervical cancer patients who participated in screening program but they did not come for treatment at ORCI within specified period (January 2020 to December 2020).

3.7 Variables

Objective	**Independent Variable**	**Dependent variable**	**Measurement**
Objective (1)	• Outreach Screening program • Facility-based screening	Number of Cervical cancer cases detected	• Reviewed records from the cancer registry database to identify number of women screened between January-December 2020 • To identify number of cervical cancer cases diagnosed between January-December 2020 • To categorize the cases based on the type of screening used (outreach or facility-based)

Objective (2)	• Outreach Screening program • Facility-based screening	Distribution of the Cervical cancer cases detected by stages; STAGE I STAGE II STAGE III STAGE IV	• To identify number of cervical cancer cases diagnosed between January-December 2020 • To categorize the cases based on the type of screening used (outreach or facility-based) • To analyze the number of cases detected and their stage at detection for each screening method
Objective (3)	• Outreach Screening program • Facility-based screening	Proportion of cervical cancer patients seeking treatment at ORCI	• To identify patients diagnosed with cervical cancer through each screening method between January-December 2020 • To track the treatment initiation to each patient • To calculate the proportion of who started treatment for each screening method
Objective (4)	• Outreach Screening program • Facility-based screening	Proportion of cervical cancer patient survival	• To track patient record for three years after diagnosis (January 2020 to December 2023) • To calculate the proportion of patients who survive for three years for each screening method
Objective (5)	• Social demographic factors (age, education level, marital status and occupation)	utilization of cervical cancer outreach screening program	• To review records on the cancer registry database and reports on cervical cancer screening to obtain social demographic data

3.8 Data collection methods

Retrospective data collection from ORCI cancer registry, medical records database and reports on cervical cancer screening were used to gather baseline information on social demographic data, screening numbers, treatment records and survival data records of patients by using data structured abstraction form with the guidance from a toolkit for cervical cancer prevention and control program (47). I conducted consistency checks to verify that data elements were consistent across different sources, ensuring that the same variables were measured in the same way. Additionally, I performed data cleaning to correct errors, inconsistencies, or inaccuracies in the data.

3.9 Data management and analysis

Data obtained from the ORCI cancer registry and database crosschecked before proceeding to ensure completeness and accuracy. There were a backup of data regularly to prevent loss. Stata 18 version was used to analyze the data and do the analysis.

3.10 Data analysis

Objective	Analysis plan
Objective (1)	• Descriptive analysis used to calculate the number of cervical cancer cases detected through each screening program
Objective (2)	• Stratified analysis used to stratify the cases by stages
Objective (3)	• By calculating the proportion of cervical cancer patients who initiated treatment after detection for outreach and facility-based
Objective (4)	• By calculating the proportion of survival among cervical cancer patients for both outreach and facility-based
Objective (5)	• By conducting descriptive statistics for social demographic variables • By using regression statistical tests to examine the association between each demographic factor and the utilization of cervical cancer screening through outreach and facility-based methods

3.11 Ethical consideration

Ethical approval was required from the Institutional Review Board (IRB) of Muhimbili University of Health and Allied Sciences (MUHAS) to conduct this study. Permission to conduct the study was obtained from the Executive Director of Ocean Road Cancer Institute (ORCI). All information from the ORCI database was protected from unauthorized access by protecting the data file with a password. To prevent potential information loss, a specific folder holding the original data file and an additional folder for analysis were generated. Backups were kept up to date for the duration of the report and data analysis.

CHAPTER FOUR

4.0 STUDY FINDINGS

4.1 Social demographic characteristics of participants for outreach and facility screening programs

Table 1 presents the socio-demographic characteristics distributed across outreach and facility-based programs for Cervical Cancer Screening. The study analysed data from 6,165 women, with a mean age of 28.7 years. Most respondents were below 30 years (50.2%), followed by 30-45 years (37.4%). Regarding education, the majority had primary education (53.6%) where by most of these came from outreach (50.2), with a minority having higher education (0.4%). Marital status indicated that more than half (61.4%) were married where by most of them came from facility-based. Most were employed (63%) and majority of them come from facility-based as presented in the table below. The study findings revealed that, there is a significant difference (p-value = 0.009) in screening rates by age. Women between 30-45 and those above 61 are more likely to be screened at a facility compared to outreach programs. A strong difference exists (p-value < 0.001) between education and screening approach whereby women with informal education are much more likely to be screened through outreach programs compared to facility-based screening. Marital status also shows a significant difference (p-value < 0.001) whereby unmarried women are more likely to be screened through outreach compared to facility-based programs. There is a weak but statistically significant difference (p-value = 0.036) in screening by employment status whereby unemployed women are slightly more likely to be screened through outreach programs.

Table 1: Distribution of social demographic characteristics across the utilization of cervical cancer screening programs through outreach and facility (n=6165)

Variable		Number (%)	Outreach (%)	Facility (%)	p-value
Age	Below 30	3097(50.2)	1,420 (45.9)	1,677(52.1)	**0.009**
	30-45	2307(37.4)	1,014 (44)	1,293 (56)	
	46-60	462 (7.5)	241(52.2)	221(47.4)	
	61+	299(4.9)	128(42.8)	171(57.2)	
Education level	Informal education	926(15)	651 (70.3)	275(29.7)	**<0.001**
	Primary	3306(53.6)	1,658(50.2)	1,648 (49.8)	
	Secondary	1911(31)	491(25.7)	1,420 (74.3)	
	Higher	22(0.4)	3(13.6)	19 (86.4)	
Marital status	Unmarried	2383 (38.7)	961(40.3)	1,422 (59.7)	**<0.001**
	Married	3782 (61.4)	1,842(48.7)	1,940 (51.3)	
Employment status	Unemployed	2280 (37)	997 (43.7)	1,283 (56.3)	**0.036**
	Employed	3885 (63)	1,806(46.5)	2,079 (54.5)	

4.2 Number of cervical cancer cases detected

Figure 1 indicates the number of cervical cancer cases detected in both outreach and facility programs. A total number of 1052 women were detected to have cervical cancer from both outreach and facility. Through the outreach program, 95 women out of 2,803 (3.4%) were detected to have cervical cancer. At the facility level, 957 women out of 3,362 (28.5%) were detected to have cervical cancer.

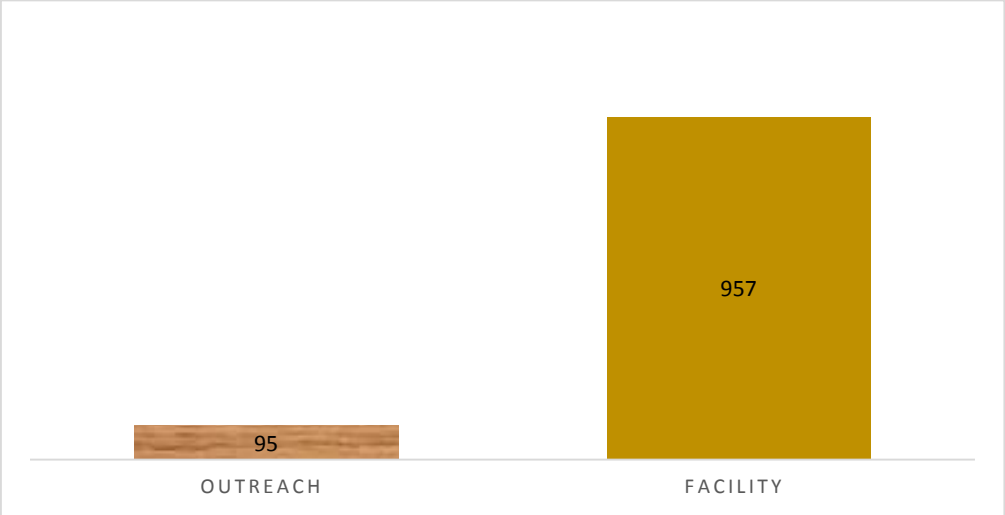


Figure 1: Number of cervical cancer cases detected

4.3 Distribution of the cervical cancer cases detected by stage

The results as shown in Figure 2 indicate that most of the cervical cancer cases at outreach were detected at an early stage 59 (62.1%) and at the facility level, most of the cervical cancer cases were also detected in the early stage 598 (62.5%) compared to late stage.

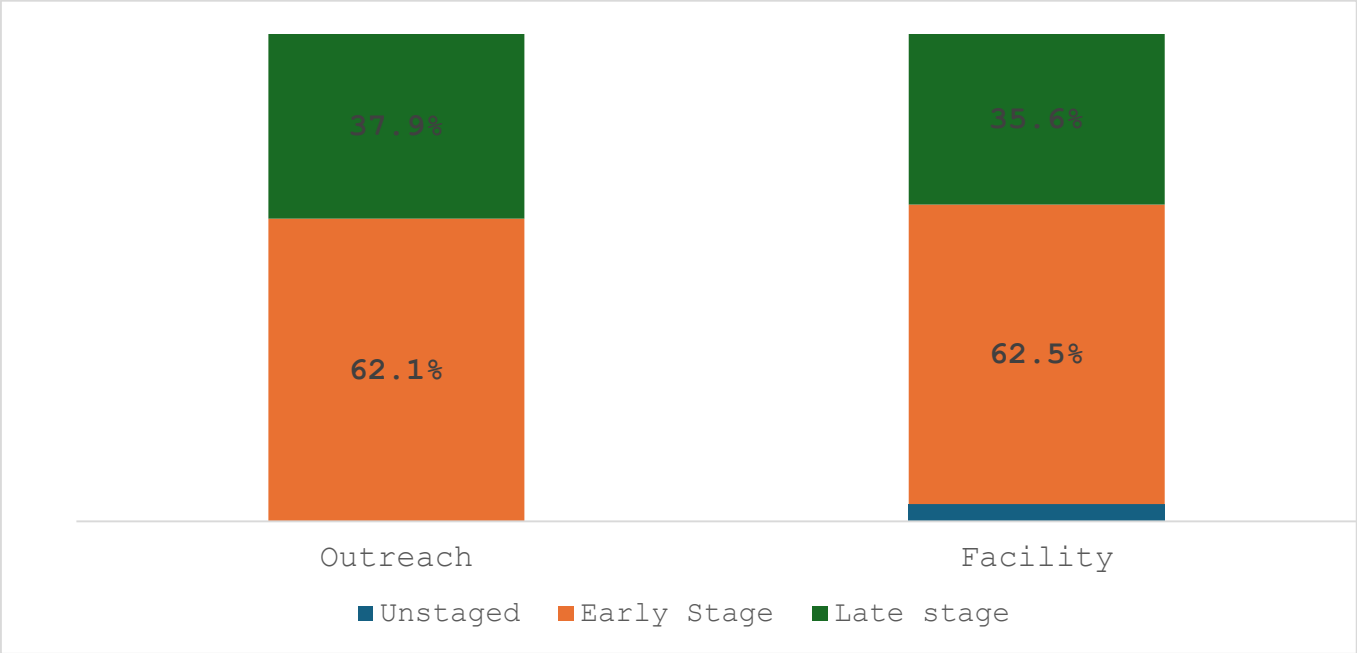


Figure 2: Distribution of the cervical cancer cases detected by stages

4.4 Cervical cancer patients seeking treatment at ORCI

Figure 3 indicates that only 16 (16.8%) of women out of 95 women who were detected with cervical cancer from outreach sought treatment at ORCI between the period of January to December 2020. At facility level 865 women out of 957 women detected with cervical cancer, (90.4%) sought treatment at ORCI between the period of January to December 2020.

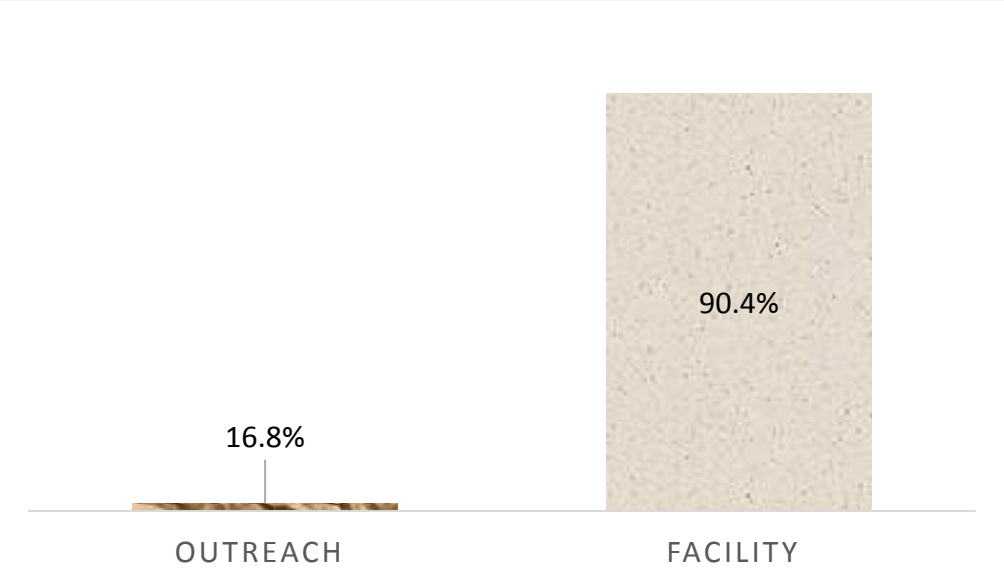


Figure 3: Cervical cancer patients seeking treatment at ORCI

Figure 4 indicate the graph shows the number of cervical cancer cases detected and the proportion of patients seeking treatment at Ocean Road Cancer Institute (ORCI) through both outreach and facility-based screening programs.

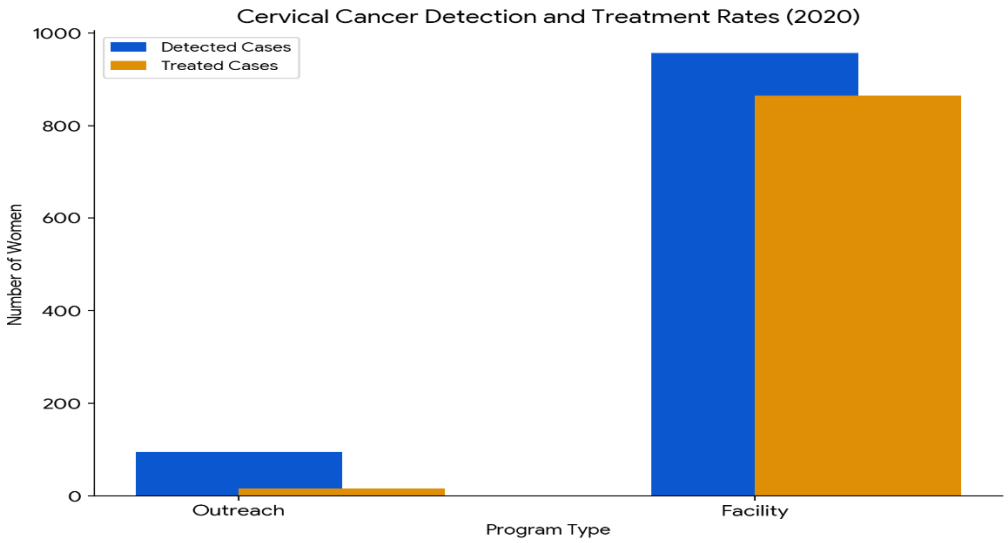


Figure 4: Number of cervical cancer cases detected and cervical cancer patients seeking treatment at ORCI

4.5 Cervical cancer patients' survival

The survival rate among cervical cancer patients has been declining consecutively from 2020 to 2023 where among the 865 women that were enrolled into care in 2020, the survival rate was 85.6% followed by 80.83% and finally 66.61% in 2021, 2022 and 2023 consecutively among those detected through the facility. The same picture was observed among women that were detected through the outreach program, where among 16 women that were enrolled in 2020, 81.25% followed by 69.23% and finally 66.66% in 2021, 2022 and 2023 consecutively survived as shown in figure 4.

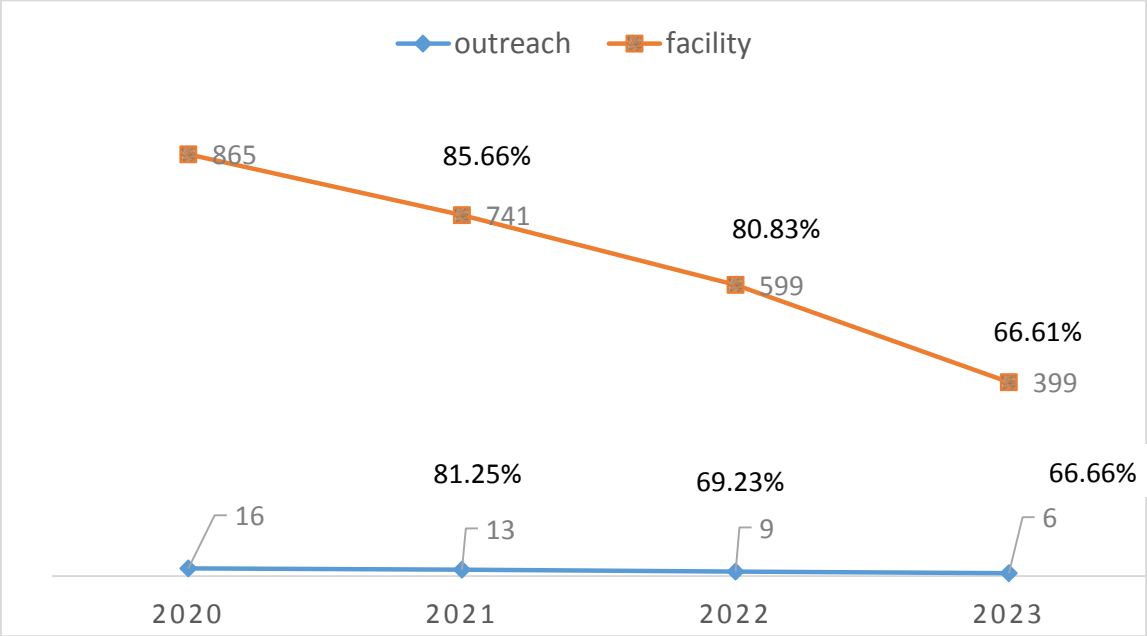


Figure 4: Cervical cancer patients' survival

4.6 Determinants for utilization of cervical cancer screening program through outreach and facility

Table 2 presents results from logistic regression both crude and adjusted odds ratios. The results indicate that women aged 30-45(AOR=1.71, 95% CI=1.51, 1.94) years and 46-60 (AOR=1.32, 95% CI=1.07, 1.63) had higher odds of utilizing cervical cancer screening services at facility level than those with below 30 years. Women with primary education (AOR=2.44, 95% CI=2.08, 2.86), secondary education (AOR=8.15, 95% CI=6.76, 9.82) and higher education (AOR=17.10, 95% CI=4.99, 58.54) had higher odds of utilizing cervical cancer screening services at facility level compared to those with informal education. Married women had lower odds of utilizing cervical cancer screening services (AOR=0.88, 95% CI=0.78, 0.99) at the facility level compared to those who are unmarried as shown in table 2.

Table 2: Logistic regression results of utilization of cervical cancer screening program through outreach and facility and the socio-demographic characteristics

Variable		**OR (95%CI)**	***P- value***	**AOR (95%CI)**	***P- value***
Age	Below 30	**Ref**		**Ref**	
	30-45	1.08 (0.97-1.20)	0.166	1.71 (1.51-1.94)	**<0.001**
	46-60	0.78 (0.64-0.99)	**0.011**	1.32 (1.07-1.63)	**0.008**
	61+	1.13 (0.89-1.44)	0.313	0.90 (0.69-1.17)	0.428
Education level	Informal education	**Ref**		**Ref**	
	Primary	2.35 (2.01-2.75)	**<0.001**	2.44 (2.08-2.86)	**<0.001**
	Secondary	**6.85 (**5.75-8.15**)**	**<0.001**	8.15 (6.76-9.82)	**<0.001**
	Higher	14.99 (4.40-51.08)	**<0.001**	17.10 (4.99-58.54)	**<0.001**
Marital status	Unmarried	**Ref**		**Ref**	
	Married	0.71 (0.64-0.79)	**<0.001**	0.88 (0.78-0.99)	**0.035**
Employment status	Unemployed	**Ref**		**Ref**	
	Employed	0.89 (081-0.99)	**0.036**	0.99 (0.88-1.11)	0.912

CHAPTER FIVE

5.0 DISCUSSION

5.1 Introduction

In this section, the study findings are interpreted and discussed with a comparison of what was reported by previous studies. Under this study, we report cases detected, stage, treatment, survival and determinants of utilization of screening services for cervical cancer patients detected through outreach compared to facility screening programs conducted by Ocean Road Cancer Institute.

5.2 Cervical cancer cases detected

The study found that cervical cancer detection at outreach program was lower compared to facility level. The possible explanation might be less willingness to undergo cervical cancer screening by women because they have not experienced any symptoms, and lack of awareness and knowledge on cervical cancer screening services. The study findings suggest the implementation of intensive community-based health education campaigns to raise awareness about the importance of cervical cancer screening, even in the absence of symptoms as well as collaborate with local community leaders, women's groups, and influential figures to address cultural barriers and normalize cervical cancer screening (48). The study findings differ from previous studies which highlighted the positive impact of screening programs by outreach in improving treatment outcome for cervical cancer patients(49). The study conducted in Uganda revealed that more people were screening for cervical cancer in outreach than in hospital(28). The possible explanation for such variation must be due to geographical location of the study areas, study population and level of awareness and willingness among women on cervical cancer screening.

5.3 Stage of cervical cancer detection

The study found that most of cervical cancer cases were detected at an early stage for both facility-based and outreach programs. The possible explanation must be public education campaigns and outreach programs have raised awareness about the importance of regular

cervical cancer screening, leading more women to undergo screening tests like Pap smear and HPV test and cervical cancer screening services are offered freely in Tanzania. Studies found that early-stage cervical cancer is generally more treatable and has a higher probability of successful treatment and cure compared to advanced-stage disease(50,51). The current study findings differ from previous study conducted in rural areas in Tanzania which reported that high percentage of women with cervical cancer were detected in advanced stages (37). Additionally the study findings differ from previous studies where by the proportion of women detected at advanced stages of cervical cancer was higher than those diagnosed at an earlier stage (34,35).

5.4 Cervical cancer patients seeking treatment at ORCI

The study found that only 16.8% of women detected with cervical cancer through the outreach program sought treatment, compared to 90.4% from the facility-level program. The outreach screening program has emerged as a method to improve early detection and treatment of cervical cancer in underserved populations, but the current study findings reveal a lower treatment-seeking behavior among women in the outreach program**(52)**(53). Lower treatment seeking behavior for cervical cancer among women detected at outreach program might be due to financial barriers. A study conducted in Tanzania reported that the high cost of travel hinders many women from accessing treatment at ORCI (54). This is associated with the fact that historically, ORCI has been the only specialized cancer treatment center in the country offering both chemotherapy and radiotherapy, requiring patients to travel from different parts of Tanzania to seek treatment. This seems to be a significant obstacle to accessing treatment(54). Studies have reported that another major barrier to seeking treatment among women with cervical cancer, especially those from outreach programs, is the misconception and poor beliefs about cancer such as cancer is a curse so it has no treatment and trusting traditional medicine to be more effective, especially among women living in rural areas(23,55). The study findings differ from previous studies, which suggested that the outreach screening program was effective in identifying a higher number of cervical cancer patients who seek treatment compared to facility-based screening (38).

5.5 Cervical cancer patients' survival

The study findings indicated that the survival among cervical cancer patients has been declining consecutively from 2020 to 2023, for both those detected in facility and those detected through outreach programs. The study found that the decline in survival was more pronounced for those detected through outreach programs. The possible reasons might be delayed initiation of treatment, poor adherence to lengthy treatment regimens, as well as many parts of Tanzania, especially rural and underserved areas, lack adequate healthcare infrastructure, oncology specialists, and cancer treatment facilities(56). Studies have reported that low survival rates among women with cervical cancer in Sub-Saharan Africa are caused by a number of factors including poor access to medical facilities, especially in rural areas, poor nutrition and co-morbid conditions, such as anemia, HIV infection, late presentation of the disease, poor quality of care provided by many health services, high rate of patients lost to follow-up, women not completing treatment due to barriers imposed by poverty, limited treatment facilities, and where available, they are not affordable for most women in the region(57,58). The study findings highlight importance of improving access to medical facilities, especially in rural and underserved areas, to ensure timely diagnosis and treatment of cervical cancer, expand availability and affordability of cervical cancer treatment facilities, including chemotherapy and radiotherapy services, across the country, as well as strengthen patient follow-up systems to minimize loss to follow-up and ensure completion of the full treatment schedule. The study findings on one hand corroborates previous studies conducted in Tanzania which reported low survival rate(17,59), but on the other hand differ from other studies conducted in other countries which indicated higher survival rate for cervical cancer patients(60,61).

5.6 Determinants of utilization of cervical cancer screening program through outreach and facility

The study findings show that women aged 30-45 years and 46-60 years had higher odds of utilizing cervical cancer screening services at facility level than those with below 30 years. This positive correlation between older age and screening can be attributed to the sensitive awareness among older women regarding the preventive benefits of screening for cervical cancer. Additionally, older women tend to have more frequent visits to healthcare facilities, particularly

for antenatal and postnatal care, which creates opportunities for receiving counseling and information pertaining to cervical cancer screening services. Given the increased risk of developing cervical cancer faced by older women in this age group, they are more motivated to prioritize regular screening as a means of early detection and prevention. This finding is consistent with previous studies that also revealed that older women were more likely to be screened for cervical cancer than younger women(62–64).

Moreover, the study findings revealed that women with primary education and above had higher odds of utilizing cervical cancer screening services at facility level compared to those with informal education. These educated women are likely to possess a higher level of health knowledge and awareness regarding the potential consequences of cervical cancer(65). Additionally, they tend to exhibit better healthcare-seeking behaviors and have the ability to make informed decisions about their health compared to women with less education. Furthermore, their literacy skills enable them to access and comprehend information about cervical cancer screening from healthcare institutions and the media, which can shape their attitudes towards screening. Educated women often have a greater degree of independence, as they are less influenced by cultural taboos and possess more autonomy in making healthcare-related choices compared to individuals with lower levels of education. Other studies also indicated that educated women were more likely to be screened for cervical cancer than those with lower levels of education(66–68).

5.7 Study strengths and limitations

There are some strengths of this study, as the conducted a comprehensive analysis of cervical cancer screening, examining detection rates, stage of diagnosis, treatment-seeking behavior, survival outcomes, and determinants of screening utilization. By using multiple data sources and comparing outreach and facility-based screening, the study provided valuable insights into the factors influencing cervical cancer outcomes. The analysis of survival trends and comparison with previous research further contributes to a broader understanding of cervical cancer screening and treatment. Overall, the study's comprehensive approach and valuable findings make it a significant contribution to the field.

Apart from those strengths the study have some limitations, as the study highlights a lower treatment rate after outreach screening but doesn't explore the reasons behind it. There could be various factors like cost, distance to treatment centers, cultural beliefs, or lack of awareness about treatment options, and survival rates were tracked for only 3 years, a longer follow-up period might be needed to get a more strong understanding of long-term survival trends. The study was conducted in Tanzania, and the findings may not be directly applicable to other countries with different healthcare systems and cultural contexts. However, future research can gain deeper insights into the barriers to treatment after outreach screening, provide a more complete picture of long-term survival trends, and enhance the generalizability of the findings to other settings.

CHAPTER SIX

6.0 CONCLUSION AND RECOMMENDATIONS

6.1 Conclusion

The study findings show that outreach programs for cervical cancer screening detect cancer cases, especially early-stage cases. Alongside facility screening, they contribute to early detection overall. However, facility-based screening finds many more cases, and those women are much more likely to get treatment. The study also found a concerning decline in survival, particularly for those detected through outreach. This suggests a need to address potential barriers to treatment initiation and completion. Finally, the study identifies factors like age, education level, marital status and employment status affecting who gets screened in facilities, it shows that older women are more likely to be screened and women with more education are more likely to be screened. This suggests a need for targeted outreach and education to improve screening rates, especially for younger women and those with lower education.

6.2 Recommendations

National Level (MoH):

- Enhance Data Collection and Improve Data Quality. Ensure accurate and complete data collection on cervical cancer cases, including stage at diagnosis, treatment received, and survival outcomes.
- Conduct Regular Monitoring and Evaluation: which can increase the effectiveness of cervical cancer prevention and control programs.
- Allocate funds for research to investigate the determinants of cervical cancer screening utilization and outcomes.
- Develop and fund targeted outreach programs for younger women and those with lower education levels.

Facility Level (ORCI):

- Collaborate with local NGOs, community leaders, and faith-based organizations to reach underserved populations for outreach programs and education initiatives.
- Analyze the data from outreach screening program to identify areas with low screening rates and allocate resources accordingly.
- Implement appointment reminder systems to reduce missed screenings and treatment follow-ups.
- Train healthcare providers on effective communication to address patient concerns and cultural sensitivities.

Further Study:

- Conduct in-depth research to understand the specific reasons behind lower treatment rates after outreach compared to facility screening.
- Evaluate the effectiveness of different outreach program designs and communication strategies in reaching younger women and those with lower education levels.
- Investigate the specific cultural beliefs that create barriers to treatment seeking behavior and develop culturally sensitive educational interventions.
- Analyze the cost-effectiveness of outreach programs compared to facility-based screening and potential cost-saving strategies for treatment.

By implementing these recommendations, there is potential to improve cervical cancer outcomes in Tanzania, ensuring more women are screened, diagnosed early, and receive timely and effective treatment, finally enhancing survival rates and reducing the burden of cervical cancer.

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APPENDICES

APPENDIX I: Data Collection Tool

DATA ABSTRACTION FORM

	Data element	Comment
1.	**Unique Identifier**	
2.	**Age**	
3.	**Occupation**	
	Employed, Self-employed, Businesswoman, Peasant Housewife,	
4.	**Education level**	
	No formal education, Primary education, Secondary education, Higher education	
5.	**Zonal Residence**	
	Southern Highland zone, Northern Highland Zone, Southern Zone, Lake Zone, Central Zone, Coastal Zone	
6.	**Screening**	
	Screening done through outreach or facility based	
7.	**Diagnosis details**	
	Diagnose with cervical cancer (Yes or No)	
8.	**Treatment Information**	
	Showed up for cervical cancer treatment at ORCI (Yes or No)	
9.	**Disease Stage**	
	Stage I, Stage II, Stage III, Stage IV	
10.	**Current status**	
	On cervical cancer treatment, not on treatment, dead	

FOMU YA KUCHUKULIA TAARIFA

	Sehemu ya takwimu	**Maelezo**
1.	**Nambari ya utambulisho wa mgonjwa(nambari hii isiweze kutumika kwa mgonjwa mwingine)**	
2.	**Umri wa mteja**	
3.	**Kazi anayofanya**	
	Mfanyakazi, Mfanyabiashara, Mkulima, Mama wa nyumbani	
4.	**Elimu ya mteja**	
	Hana elimu, Elimu ya Msingi, Elimu ya Sekondari, Elimu ya chuo	
5.	**Makazi**	
	Nyanda za juu kusini, Nyanda za juu kaskazini-mashariki, Nyanda za juu kusiini-magharibi, Kanda ya ziwa, Kanda ya Pwani	
6.	**Uchunguzi**	
	Uchunguzi ulifanyika katika mpango wa huduma mkoba au ulifanyika kituoni	
7.	**Utambuzi**	
	Aligundulika na saratani ya shingo ya kizazi (ndio au hapana)	
8.	**Taarifa za matibabu**	
	Alihudhuria matibabu ya saratani ya shingo ya kizazi ORCI	
9.	**Hatua za Ugonjwa**	
	Hatua I, Hatua II, Hatua III, Hatua IV	
10.	**Hali ya sasa**	
	Anaendelea na matibabu, hayupo kwenye matibabu, amefariki	

APPENDIX II: Ethical Clearance

UNITED REPUBLIC OF TANZANIA

MINISTRY OF EDUCATION, SCIENCE AND TECHNOLOGY

MUHIMBILI UNIVERSITY OF HEALTH AND ALLIED SCIENCES

OFFICE OF THE DIRECTOR – RESEARCH, PUBLICATIONS AND INNOVATION

Ref. No.DA.282/298/01.C/2157

Date: 09/04/2024

MUHAS-REC-04-2024-2157
Joha Kibira
School of Public Health and Social Sciences
MUHAS

RE: APPROVAL FOR ETHICAL CLEARANCE FOR A STUDY TITLED: ASSESSMENT OF OUTREACH SCREENING PROGRAM ON EARLY DETECTION, EARLY TREATMENT AND SURVIVAL RATE OF CERVICAL CANCER PATIENTS AT OCEAN ROAD CANCER INSTITUTE

Reference is made to the above heading,

I am pleased to inform you that the Chairman has on behalf of the University Senate, approved ethical clearance of the above-mentioned study, on recommendations of the Senate Research and Publications Committee meeting accordance with MUHAS research policy and Tanzania regulations governing human and animal subjects research.

APPROVAL DATE: 09/04/2024
EXPIRATION DATE OF APPROVAL: 09/04/2025

STUDY DESCRIPTION:
Purpose:

The purpose of this analytical retrospective cohort study is to evaluate the effectiveness of the cervical cancer outreach screening program conducted by Ocean Road Cancer Institute on the improvement of cervical cancer treatment compared to facility-based screening.

The approved protocol and procedures for this study is attached and stamped with this letter, and can be found in the link provided: https://irb.muhas.ac.tz/storage/Certificates/Certificate%20-%2015363.pdf and in the MUHAS archives.

The PI is required to:

1. Submit bi-annual progress reports and final report upon completion of the study.
2. Report to the IRB any unanticipated problem involving risks to subjects or others including adverse events where applicable.
3. Apply for renewal of approval of ethical clearance one (1) month prior its expiration if the study is not completed at the end of this ethical approval. You may not continue with any research activity beyond the expiration date without the approval of the IRB. Failure to receive approval for continuation before the expiration date will result in automatic termination of the approval for this study on the expiration date.
4. Obtain IRB amendment (s) approval for any changes to any aspect of this study before they can be implemented.
5. Data security is ultimately the responsibility of the investigator.
6. Apply for and obtain Data Transfer Agreement (DTA) from NIMR if data will be transferred to a foreign country.
7. Apply for and obtain Material Transfer Agreement (MTA) from NIMR, if research materials (samples) will be shipped to a foreign country.
8. Apply for and obtain permission to publish the results from National Institute for Medical Research. The application should be before submitting to a publisher and not concurrently through the email publications@nimr.or.tz.
9. Any researcher, who contravenes or fail to comply with these conditions, shall be guilty of an offence and shall be liable on conviction to a fine as per NIMR Act No. 23 of 1979, PART III section 10 (2)
10. The PI is required to ensure that the findings of the study are disseminated to relevant stake holders.
11. PI is required to be versed with necessary laws and regulatory policies that govern research in Tanzania. Some guidance is available on our website https://drp.muhas.ac.tz/.

9th April 24

Dr. Kasusu Nyamuryekung'e.

Chairperson, MUHAS Research and Ethics Committee

Muhimbili University of Health & Allied Sciences
DIRECTOR
Research, Publications & Innovations
Box 65001

APPENDIX III: Acceptance Letter

UNITED REPUBLIC OF TANZANIA

MINISTRY OF HEALTH

OCEAN ROAD CANCER INSTITUTE

ORCI OCEAN ROAD CANCER INSTITUTE

On Reply Please Quote:

Ref: 10/VOL.XXI/221B

Date: 13th May, 2024

INSTITUTIONAL ACADEMICS, RESEARCH, PUBLICATIONS AND ETHICS COMMITTEE

Joha Kibira
Reg no: HD/MUH/T.567/2022
MSc. Project Management Monitoring Evaluation in Health
MUHAS

Re: Approval to collect data for the study "Assessment of outreach screening program on Early detection, early treatment and survival rate of cervical cancer patients at Ocean Road cancer Institute."

Reference is made to the above heading, this is to let you know that the Institute Academics, Research, Publications and Ethics Committee has granted you permission to conduct this study. For a period of one year ending; May 2025.

Upon successful completion of the study, you are obliged to submit a copy of the final document of this research project to the IARPEC.

Yours Sincerely,

OCEAN ROAD CANCER INSTITUTE ACADEMIC UNIT P.O. Box 3592 DAR ES SALAAM

Dr. Mamsau Ngoma
Academic Unit, ORCI

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