RESEARCH PROPOSAL

Research project title: Factors influencing cancer screening and impact of early Detection on breast and cervical cancer outcomes amongst Rwandan women.

❖ Abstract

The cancer screening prevalence and correlates in older adults. In the context of heightened efforts for prevention and early diagnosis, we collected information on screening for two major types of cancers: cervical and breast cancer in order to establish their prevalence estimates and correlates among older women , based screening has been associated with marked decreases in cervical cancer incidence and mortality . The study design will be a community-based cross-sectional survey and analytical study. This study will be conducted from January 2023 to September 2023. The data will be collected by using pretested, structured interview-based questionnaires. The data will be entered and analyzed using SPSS version 21. Moreover, it is hoped that the results of the study will determine prevalence, risk factors, the effect of early screening on breast and cervical cancer outcomes, the proportion of breast and cervical cancers diagnosed through screening and quantify the number of women screened among women in 4 districts of Rwanda and indicate what interventions are needed through education, counseling, and management. This study will promote and support early screening of breast and cervical cancer among mothers of Rwanda and increase the number of mothers who observe to achieving the better early screening of cancer and also implement the policymakers, an intervention that could improve early screening breast and cervical cancer.

❖ Literature and introduction of the proposed research project

Cancer is the most common health problem worldwide, with approximately 8.2 million cancer related deaths and 14 million new cases reported in 2012 [1] Cervical and breast cancers greatly affect low- and middle-income countries. Cervical cancer is the fourth most common cancer diagnosis among women globally; 85% of cervical cancer cases and 87% of deaths occur in less developed regions [2]. Breast cancer is the most common cancer among women, accounting for 25% of all cancers diagnosed among women worldwide; a slight majority of these cases occur among less developed regions, with more favorable survival rates in developed regions [3].

Breast and cervical cancer are the leading causes of cancer morbidity and mortality among women in Sub-Saharan Africa. Breast cancer is the most common cancer in in Sub-Saharan Africa and although incidence rates are lower than those of high-income countries, mortality rates in some in Sub-Saharan Africa countries are similar [4]. Most SSA countries do not have cervical or breast cancer screening programs and the majority of cancers are diagnosed symptomatically and at an advanced stage. Delayed breast cancer diagnoses are likely a major contributor to advanced-stage presentations in in low- and middle-income countries. Studies from high-income countries have suggested that patient delay is linked to advanced-stage presentations and worse survival [4].

Breast cancer is a proliferation of malignant cells that arises in the breast tissue and the term represents a range of diseases from non-invasive to metastatic carcinoma [5]. It is the most common cause of cancer death worldwide for females, and the second most common cancer among all other cancers, with over 2 million new cases in 2018 [5,6]. Evidence shows poor awareness of breast cancer symptoms, prevention mechanisms, risk factors and treatment options have usually been associated with patient delay in seeking help, making treatment less effective and minimal survival rate[6,7]. Screening is the most effective method to reduce mortality and morbidity from breast cancer. Screening methods like that of self-breast examination, clinical breast examination and mammography have been defined as activities facilitating the early screening and improvement of women's health and is said to be good for early detection of breast cancer [8]. Screening is a relatively available resource for early detection though awareness about breast cancer screening is very low and globally more than half the breast cancer deaths occur in low middle income countries [6, 9].

Human papillomavirus (HPV) is a sexually transmitted virus found in virtually all cases of cervical cancer, which kills 275 000 women every year and is the biggest contributor to years of life lost from cancer among women in the developing world [10]. Cervical cancer is the most common cancer among women in Rwanda. In 2010, 986 cases of cervical cancer were diagnosed in Rwanda and 678 women died from the disease [10]. That same year, Rwanda evaluated options for HPV vaccination rollout and decided to pursue a partnership with Merck to offer Rwanda's young girls the opportunity to receive a life-saving vaccine [11]. Cervical cancer is one of the most preventable types of cancer. By reducing risk factors such as Infection with the human papilloma virus (HPV) is the most significant risk factor for cervical cancer which can be transmitted during sexual intercourse. The other risk factors include early age at first intercourse, multiple sexual partners, poor sexual hygiene, repeated child birth, smoking, immunodeficiency, having a history of cancer etc [12]. In high-income countries, screening for cervical cancer is generally integrated into the annual consultations recommended for women. However, in many low- and middle-income countries most women do not have access to such regular encounters with the primary-health-care system. Fortunately, screening methods for cervical cancer are diverse and easily implemented. They include testing for HPV DNA, the Papanicolaou or "pap smear" test, visual inspection with acetic acid, colposcopy and biopsy. Precancerous lesions, or dysplasia, can take 10 to 20 years to develop into cervical cancer. Therefore, even though early detection is crucial, screening for cervical cancer can be effectively conducted at longer intervals than screening for breast cancer or other forms of cancer that progress more rapidly than cervical cancer [13]. The overall effects of cervical cancer can be reduced through vaccination against the human papillomavirus (HPV), screening for precancers and cancers, and treatment of precancerous lesions. Approaches to reduce the effects of breast cancer include early awareness

and care seeking, clinical breast examination, and screening with mammography, depending on country priorities and resources [14].

Besides poverty, low public awareness of breast cancer is a barrier to breast cancer control in LMICs where women seek medical help late and cancers are often diagnosed at advanced stages when very little can be done in terms of curative treatment. The Breast Health Global Initiative (BHGI) panel [5, 6] has recommended implementation strategies to optimize breast cancer management in LMICs concerning health-care systems, breast cancer diagnosis, treatment and early detection. For early detection, efforts must be devoted to improve community awareness. Civil society, represented by non-governmental organizations (NGOs), can play an important role in breast cancer control.

The major goal of the screening program is to reach women who are underserved, uninsured, or under-insured who are rarely or never screened. Due to the fact that all women in Rwanda fall into these categories, all women in Rwanda are eligible for the program. This program is promoted through community meetings and the media. Screenings are performed by health care providers in the central public health clinic, community health centers in the outlying states, and in local private clinic. Women are screened by Pap smear testing, clinical breast exams, and by mammography screening. This study is the first of its kind in Rwanda. It aims to provide an understanding of the impact of breast and cervical cancer screening on stage of diagnosis and survival outcomes of patients diagnosed with breast and cervical cancers, and to determine if these factors are improving over time.

- **Statement of the Problem**

Breast and cervical cancer is important public health problem .To date, no research has been done regarding factors influencing cancer screening and impact of early screening on breast and cervical cancer outcomes in Rwanda. Hence there is need to provide an understanding of the impact of breast and cervical cancer screening on stage of diagnosis and survival outcomes of patients diagnosed with breast and cervical cancers, and to determine if these factors are improving over time. The top 20 countries worldwide with the highest burden of cervical cancer in 2018 were in Africa and 34 out of every 100 000 women are diagnosed with cervical cancer and 23 out of every 100 000 women die from cervical cancer every year in Africa.

Women below 18 of age have not yet fully developed to make use of screening , besides early screening has been well established among Public Health scientists; hence the recommendation for early screening for all women more than 18 years old. Even so, however, efforts to promote early screening have either in most cases achieved less than desired outcomes or run into severe problems. One contributory factor to such outcomes is that public health interventions more often than not are tailored to meet the individual needs of breast and cervical cancer mothers without taking into account the wider impact of family influence on behaviour and decision making. This perhaps is conceivable given the poor understanding of family influences on early screening of breast and cervical cancer particularly in rural areas. An in-depth understanding of family structures in rural communities is thus central to the development of comprehensive approaches to health interventions and education services in Rwanda. Despite this increasing need to tackle chronic diseases with additional resources and effort, under-nutrition and communicable infectious diseases remain a core focus of researchers and policy makers within the African continent, with insignificant attention assigned to breast and cervical cancer and chronic, non-communicable diseases. The lack of attention given to the breast and cervical epidemic may have been spurred on by the earlier misrepresentation of health information, which led to the misperception of ‘healthy.

Underutilization of breast and cervical cancer screening has been observed in many underserved populations. Women of low socioeconomic status, the prevalence of Pap testing remains relatively low. The combination of low income and low education places women at increased

risk for non-adherence to cancer screening practices and cervical cancer. Specifically, women of minorities, older women, uninsured, and women living at the poverty level do not obtain any screening or have not been screened at recommended intervals.

- **General objective**

The objective of the study is to determine prevalence, risk factors, the effect of early screening on breast and cervical cancer outcomes, the proportion of breast and cervical cancers diagnosed through screening and quantify the number of women screened among women in 4 districts of Rwanda.

- **Specific objectives of the study**

1. To determine the prevalence of breast and cervical cancer
2. To determine the effect of early screening on breast and cervical cancer outcomes
3. To determine the risk factors influencing breast and cervical cancer.
4. Identify the proportion of breast and cervical cancers diagnosed through screening

- **Research Question**

1. What is the prevalence of breast and cervical cancer
2. What is the effect of early screening on breast and cervical cancer outcomes
3. What is the risk factors influencing breast and cervical cancer.

- **Significance of the study and innovation**

Breast and cervical cancer patients: The research findings will benefit with breast and cervical cancer the will be aware of the various practices to engage in reduce complications of the condition. The levels of screening will also be increased on management modalities of condition as well as the lifestyle activities they have to engage in

Nurses and doctors: They would benefit by designing health educational programs on breast and cervical cancer and its prevention in the hospital as well as the communities.

District health directorate: The District health directorate would be able to document the various incidence rates and help curb the high rates in the district. The directorate would be able to explore the concerns of breast and cervical cancer and how to address them to provide quality life. This study will be salutary; as it will contribute to a better understanding of how essential health interventions with proven empirical efficacy such as early screening of breast and cervical cancer can be promoted. It is also hoped that this study's outcome will contribute to the growing body of scientific knowledge on women precancers and how to design and situate health interventions in rural communities.

Policy makers: Policy members would be aware of the disease burden and come out with policy direction on preventive programmes and strategies to reduce breast and cervical among women in Rwanda.

Future research: The study would expect to help future researchers who would want to conduct similar studies in other areas for more data. This will help to document and add to the data base of condition.

- **The goal of the study**

By the end of the study participants' screening and health education will be improved both healthy and quality of their lives.

- **Materials and methods**

- **Introduction to Research Methodology**

The methodology selected for the projected study will be detailed here. The strategic research design, methods of sample selection, data collection and analysis of results will be explained. Ethical considerations for this specific research study will also be detailed. It is hoped that the chosen methodology will generate useful information that concluded the collection and analysis of data on factors influencing cancer screening and impact of early screening on breast and cervical cancer outcomes amongst

- ✓ **Study design and period**

The study design will be a community-based cross-sectional survey and analytical study

This project will be base a community-based cross-sectional survey and will be conducted from January 2023 to September 2023.

- ✓ **Study setting**

This study will be conducted in two districts urban and two districts rural in Rwanda. Rwanda is a low-income country with a population of 12 million. Both the urban and rural st sites will be in Northern Rwanda city of Kigali and Eastern Rwanda. Sensitization on cervical cancer screening will doing by radio advertisements and with the help of community health workers before and during the screening period.

- ✓ **Study participants**

The target population will be comprised of married women aged 18-49 years old. Participants will be selected based on a systematic random sampling method. A systematic random sampling approach will be used where all mothers/babies will see in the hospital during the period of data collection were enrolled if inclusion criteria were met.

Inclusion criteria:

- ✓ Women who will be in the age bracket 18- 50 years at the time of the study
- ✓ Women who will be willing to participate in the study.

Exclusion criteria:

- ✓ Women never gave their consent.
- ✓ Women who were less than 18 years at the time of the study
- ✓ Mothers who will not willing to participate. Mothers who will unwell.

- **Sample Size and Sampling Technique**

Sample is a group of people, objects or items that are taken from a larger population for measurement (Taherdoost, 2015). The sample is a representative of the total population, which ensures that findings from research studies can be generalized to the population as a whole. Purposive non- probability sampling method was employed in this study. The method chosen

enabled the researchers obtain data from actual respondents. The sample size was determined using the slovins formula, $n = N / (1 + Ne^2)$. Where n = Sample size, N= Population size, e= Margin of error. The sample for this study will be obtained from 4 different District of Rwanda and a 10% non-response rate. Hence the sample size will be calculated separately.

Sample size for 4 Districts of Rwanda

$n = N / (1 + Ne^2)$

N = 2.314.683 e = 5%. $n = 2.314.683 / [1+2.314.683 (0.05^2)] = 399, 93$

n=400+10%of non-response

Therefore, n = 440.

- **Data collection techniques and tools**
    - **Data collection**

A structured and pretested interviewer administrated questionnaire will be used to gain data from study participants. First, the questionnaire will be translated to the Kinyarwanda language which is a local language in an understandable way to exclude misunderstanding to assure data quality. Data collection will doing from subjects at the time of cancer screening through use of a standardized questionnaire. All participants will be completed a baseline questionnaire at study enrollment including sociodemographic characteristics (e.g. age, marital status, education, employment, income); health (e.g., chronic illness, risk behaviors); health care (e.g., access, health insurance); and health literacy (e.g., cancer literacy tools) during a home visit. Cancer screening questions included: “Have you ever had a test for a PAP smear (By PAP smear test, I mean did a doctor or nurse use a swab or stick to wipe from inside your vagina, take a sample and send it to the laboratory?”, “Have you ever had a test for a HPV test” “Have you ever had a

mammogram (when your breasts are examined using X-rays).” ,MRI, clinical breast exam, or diagnosis with services funded by national breast and cervical cancer early detection [15] Response options were “yes “and “no”, and if “Yes” it was asked, “How long ago was it done?” The response option ranged from 1=within the last year to 5=more than 10 years ago [16].

- **Independent variables**

These variables include; socio-demographic variables: these included(age group, marital status, education level, social economic status, number of pregnancies, number of children born, age of the first pregnancy and number of sexual partners, age of first intercourse, sexual transmitted Infections, age of the first and last pregnancy, use of oral contraceptive pills as family planning, HIV status, smoking and alcohol.

- **Dependent variable**.

The dependent variable for this study will be breast and cervical cancer

- **Reliability and validity of the instrument**

Reliability is the overall consistency of a measure or repeatability of findings. The questionnaires were carefully scrutinized by the supervisor of this research and the necessary corrections were made to guarantee reliability. Reliability for the instruments will be pre-tested in a pilot study among 10 patients who meet the inclusion criteria and will be included in the study sample. The needed corrections will doing based on the observations made during the pre-test. Cronbach’s alpha will be used to test for reliability and validity of the research instrument as contained in table below:

- **Data analysis**

Data analysis is the process of inspecting and transforming data with the goal of discovering useful information, in order to draw conclusions and support decision making. Data will be analyzed using the SPSS programme IBM version 21. Descriptive statistics will be utilized to summarize sociodemographic factors, health characteristics, and cancer screening prevalence using weighted percentages. Associations between socio-demographic and health variables and cancer screening methods will be examined through bivariate methods and multivariable logistic regression using two-sided 95% confidence intervals and P values less 5% will be used during

multivariable analysis to indicate statistical significance. All variables statistically significant at bivariate analyses will be subsequently added in the multivariable models

- **Ethical considerations.**

The study considered various steps to ensure that, the data collection process adhered to the ethical research standards. Approval will be granted from the National Health Research Committee to be conducted. An introductory letter will be addressed to the Hospitals management team and Director Hospitals to seek their permission for the research to be conducted. Respondents will be assured that, any information that would be gathered, would be treated confidentially. They will be therefore not allowed to indicate any information that would identify them in any way or provide their names to ensure anonymity.

- **Expected outcomes and limitations of the study**

Following this proposed study, a report will be compiled discussing all aspects of the research process including the results, limitations, and benefits. It is anticipated that the results of the study will give an indication of prevalence and impact of early screening on breast and cervical cancer and indicate where interventions are needed through education, training or management. It is also anticipated that the findings of the research study will reveal if other factors influencing early screening.

It is anticipated that these results will contribute to recommendations in future mothers' practice, mothers' education and with a view to making suggestions as to how healthcare professionals on such wards could improve the chances of more women early screening.

This study will have limitations as it will be conducted in hospital. It will give a general overview of the current early screening of breast and cervical cancer.

Language will be limitation. Most mothers could not understand English and therefore questions will be asked verbally in Kinyarwanda. The translation may to some extent have altered the meaning of the question.

The researcher recommends that other studies, both quantitative and qualitative be carried out in hospitals in other areas so that a more general picture could be established of end-of-life mothers

in Rwanda. It is the intention of the researcher to share the findings of the study with the management of the involvement of the hospital and the community in Rwanda. It is hoped that this will highlight the necessity of planning on-going education and counseling for mothers.

- **Project management**

Time (months)	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
Activity												
Literature review	**X**	**X**										
Development of questionnaires			X	X								
Recruiting participants, planning data collection				X	X							
Conducting observations and interviews					X	X	X					
Analysis phase								X	X	X	X	
Assimilation and writing of results											X	X

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