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ASSESSMENT OF KNOWLEDGE, PRACTICE AND BARRIERS TO CERVICAL CANCER SCREENING IN WOMEN ATTENDING OUTPATIENT AT DISTRICT HOSPITAL MUHIMA AND BYUMBA, RWANDA

A DISSERTATION TO BE SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE AWARD OF DEGREE OF MASTERS OF MEDICINE IN OBSTETRICS AND GYNECOLOGY OF THE UNIVERSITY OF RWANDA

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TITLE

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Authors' contributions

This study was conducted in close collaboration between the authors. The author DT wrote the protocol, collected data, and data analysis. The authors DN, PGB, KR and BML reviewed study design, reviewed the literature and corrected the writing errors.

DECLARATION

I declare that this Dissertation contains my own work except where specifically acknowledged and it has passed through anti-plagiarism system and found to be compliant with University of Rwanda regulations and this is the approved final version of the Thesis.

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DEDICATION

To the Almighty God who cares about us.

To my wife KARIGIRWA Emelyne for your love, care and encouragement,

To my children INEZA TUYISENGE Emma and AJENEZA TUYISENGE Evan your smile gave me strength and focus

To my Parents, BIREGEYA and NYIRANEZA Verena I owe my success

To my Brothers Martin, Aloys, Alexis, Philippe and Sisters Vestine, Marie-chanteuse, Carine

To my lovely Teachers

I dedicate this work.

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PRECIS

There is poor knowledge of women about cervical cancer screening at the district hospitals in Rwanda; more education is needed to reduce cervical cancer mortality.

ABSTRACT

OBJECTIVES: To evaluate knowledge of women about cervical cancer screening, practice, and barriers to screening at district hospitals in Muhima and Byumba, Rwanda.

METHODS: This was a prospective cross-sectional study conducted at two district hospitals, Muhima and Byumba, from November 2019 to February 2020. Interviews by structured questionnaire were performed in 384 women, age 30-65 years attending outpatient in the obstetrics and gynecology department. The questionnaire included sections on demographics, symptoms and risk factors of cervical cancer, cervical cancer prevention and screening methods, practice and barriers. Exclusion criteria were a history of hysterectomy and pregnancy in the second or third trimester and 6 weeks postpartum. Analysis was done by SPSS.25 descriptive and bivariate.

RESULTS: Of 384 women, 95.5% had heard about cervical cancer. Vaginal bleeding was the most commonly known symptom of cervical cancer, known by 56.6% of women. HPV as a risk factor of cervical cancer was known by 22.7%. The source of knowledge was most commonly radio at 38.7%. Only 36.2% of women had good knowledge of cervical cancer disease. As prevention, only 39.6% knew of HPV vaccination. However, 91.7% had heard about screening programs, most commonly visual inspection (32%). Only 20.3% of women had good knowledge of cervical cancer screening but 31% had undergone cervical cancer screening. The most common challenge to screening was lack of awareness in 35.3% of women. Good knowledge of cervical cancer screening was found to be significantly higher in urban areas ($p=0.013$), employed women ($p=0.043$), secondary school and university graduates ($p=0.001$) and health professionals ($p<0.001$).

CONCLUSION

There is poor knowledge of cervical cancer and its screening in women attending outpatient at district hospitals in Rwanda. Lack of awareness appears to be the most common barrier to screening, suggesting that community education should be a significant component of any future cervical cancer screening programs in Rwanda.

Keywords: **Knowledge. Cervical cancer. Cervical cancer Screening.**

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LIST OF ACRONYMS

CI: Confidence interval

CMHS: College of Medicine and Health Science

DH: District Hospital

DNA: Deoxyribonucleic acid

HIV: Human Immunodeficiency Virus

HPV: Human Papillomavirus

IRB: Institutional Review Board

LEEP: Loop electro excision procedure

OR: Odds ratio

SPSS: Statistical Package for the Social Sciences

UR: University of Rwanda

VIA: Visual inspection with Acetic acid

VIL: Visual inspection with Lugol's iodine

WHO: World Health Organization

CHAPTER1. INTRODUCTION

Cervical cancer is a considerable origin of morbidity and mortality in Africa; a burden of non-communicable disease.[1] In 2018 there were about 600,000 new cases and 311,365 deaths related to cancer of the cervix worldwide. It is ranked number four in the causes of cancer related mortality in sub-Saharan Africa and southeastern Asia.[2] Cervical cancer causes 90% of women cancer deaths in developing countries.[3] In East Africa in 2018 there were 52,633 new cases of cervical cancer with an incidence of 20.6/100,000, and 37,017 associated deaths .[4] Rwanda registered 1304 cervical cancer cases and 921 related deaths in 2018, making it principal raison of death related to female cancers with the mortality rate of 24.1/100,000.[5] The population of Rwanda in 2019 was 12,374,397 million, with women making up 51.5% of the population.[6,7]

Cervical cancer appears after a long period of precancerous phase, which can be recognized by screening before progression to invasion. It is considered preventable with vaccination as primary prevention and screening strategies such as Pap smear, HPV (human papillomavirus) DNA testing and VIA (visual inspection with acetic acid) as secondary prevention. The necessary cause of cancer of the cervix is chronic infection with HPV.[1] Approximately 90% of HPV infections are destroyed by the immunity during a period of time, but others may persist to cause cancer.[3] Co-factors that rise the likelihood of developing cervical cancer include multiple sexual partners, immunosuppression like HIV infection, low social economic status, early coitarche, inadequate screening, increasing age and smoking.[3] Cervical cancer prevention and screening should be performed based on available resources, as recommended by the WHO, with screening of women from 30 to 65years of age.[8] Preinvasive cervical cancer generally has no symptoms. When malignant invasion of tissue is present the typical symptoms consist of abnormal vaginal bleeding, postcoital bleeding, heavy menses, and increased vaginal discharge. Treatment of preinvasive cervical disease consists of cryotherapy, loop electro excision procedure (LEEP), or cervical conization. Invasive cervical cancer is treatable by operation during initial stages or chemoradiation for early and more advanced disease.

Cervical cancer is a health condition requiring attention worldwide, but mostly in underdeveloped nations. Many studies were performed to evaluate women's knowledge of cervical cancer and methods of screening to facilitate decrease of the burden in these

populations. However, the challenges to cervical cancer screening implementation are logistical, financial and social-cultural.[9]

A study performed in Pakistan on 594 women to evaluate knowledge, attitude, and practice toward the cancer of the cervix in adult women.[10] They found that 58.2% knew about cervical cancer, 31.4% knew the Pap smear test, while 5.9% underwent a Pap smear in their life and 51.7% mentioned that the Pap test was embarrassing.[10] A study in Libreville, Gabon was conducted on 452 women to evaluate females' awareness and knowledge about cervical cancer and its screening using Pap test and human papillomavirus test.[11] They found that 91.6 % knew cervical cancer while 27.9% knew Pap smear. Among the 126 females that knew the Pap smear, 82 (65%) had undergone cervical cancer screening. Of the remaining 44, the justification for not being screened included neglect (50%), absence of money (13.6%), and fear of being diagnosed the cancer (13.6%) or considering it not useful (13.6%). They concluded on inadequate knowledge on cervical cancer in their population .[11] A similar study was performed in Kenya on 451 women to assess women's knowledge and attitudes towards cancer of the cervix and its screening.[12] They found that 79.8% were informed of cervical cancer while 15.1% knew about HPV. Among those who were knowledgeable about cancer of the cervix, 83.6 % had heard about cancer screening but only 25.6% had undergone screening.[12] A cross-sectional study done in Ethiopia on 520 women showed inadequate knowledge on cervical cancer screening as only 27% had good knowledge.[13]

The government of Rwanda, by the Ministry of Health, has developed a cervical cancer elimination strategy by screening women starting at 30 years of age. The first method of screening is visual inspection with acetic acid (VIA) which started in 2013 in 30 public hospitals with trained medical personnel. When VIA is negative the screening is repeated in 3 to 5years. Women with a positive VIA should be offered cryotherapy, and any lesion suspicious for malignancy is referred to referral hospital for biopsy. Vaccination against HPV was initiated in primary school girls in public institutions in 2011 as primary prevention against cervical cancer.[14,15] An updated protocol of cancer of the cervix screening utilizing HPV DNA testing followed by VIA is currently in progress. They are no published data on centers of screening and cervical cancer screening rate in Rwanda. Most patients present to hospitals for symptomatic, advanced cervical cancer.[16] Therefore, this study was conducted to assess women's knowledge, practice, and barriers to the screening of cervical cancer in district hospitals in Rwanda.

CHAPTER2. MATERIALS AND METHODS

This was a prospective cross-sectional study conducted in 2 district hospitals, BYUMBA and MUHIMA, in outpatient clinics of the gynecology and obstetrics department. One hospital is located in Kigali city and the other in Gicumbi district in the Northern Province, 50km from Kigali. The estimated number of women consulting clinics in gynecology and obstetrics department was thirty per day. These 2 district hospitals were chosen out of the 10 known to have nurses and gynecologists trained on cervical cancer screening with equipped screening services due to convenience, as the study had a limited budget and hospital locations were within close proximity to the investigator. From November 2019 to February 2020, there were 384 women, age 30-65, attending consultation that consented to complete a structured questionnaire. Exclusion criteria were previous hysterectomy or pregnancy in the second or third trimester or 6 weeks postpartum. The questionnaire included information on social demographics, knowledge of cervical cancer concerning its symptoms and risk factors; its prevention and screening and their barriers to screening. The questionnaire was developed from a review of a previously published study.[17] Two trained midwives assisted the investigator in the facilitation of participants to complete the questionnaire. They were requested to choose yes, no, I don't know or mention the answer in blank space. Names were not used on the questionnaire for confidentiality.

Overall knowledge on cervical cancer as a disease was determined by the number of correct answers out of 10 questions. Women were asked to respond to questions on symptoms and risk factors. A good knowledge was defined as women who were able to respond correctly to 6 or more best answers in ten, 3 on symptoms and 3 on risk factors.

Overall knowledge about cancer of cervix screening was calculated from 11 questions about cervical cancer prevention, screening definition and screening methods. Women were asked to choose one prevention method, two methods of screening and the recommended age to begin screening (30 years), end screening (65 years) and frequency of screening (every 3 years). A good knowledge was defined as women who were able to respond correctly to 6 or more best answers of eleven.

Ethical approval was acquired from the Institutional Review Board (IRB) of the College of Medicine and Health Sciences at the University of Rwanda (No 426/CMHS IRB/2019) and the ethics committee of both district hospitals (approval letter of 28th October 2019).

Data were entered by Epidata 3.1 then exported to SSPS version 25 for analysis. A descriptive analysis was done for all variables. Bivariate analysis, odds ratios and confidence intervals were calculated to find candidates' variables for multivariate analysis with the level significance ($p<0.05$). Binary and multivariate logistic regressions and corresponding 95% confidence interval were used to calculate the adjusted odds ratio. The adjusted Odds ratio at 95% CI was used to interpret the strength of association.

CHAPTER3. RESULTS

In this study, 384 women qualified and responded to the study questionnaire. The majority were between 30 to 40 years (65.5%) and multiparous (75.5%). A significant number were urban citizens (70.3%). Social demographics are recorded in **Table 1**.

The majority (95.5%) of our participants had heard about cervical cancer. 56.6% knew vaginal bleeding as a symptom of cancer of the cervix. Human papillomavirus, the risk factor of cancer of the cervix was known by 22.7%. The first source of knowledge was radio 38.7%. Women considered as having a good knowledge regarding risk factors and manifestations of cancer of the cervix were 36.2%. Those with poor knowledge were 63.8%. General knowledge about cervical cancer disease is recorded in **Table 2-3**.

The majority (91.7%) of our participants had heard about screening programs. Only 17.1% had heard about the origin of cervical cancer HPV. Age to start screening (30years) was known by 21.9% of women and age to end screening (65years) was known by 14.1%. The frequency of screening every 3 years was known by only 7.6%. Women with good knowledge about screening were 20.3%, and women with poor knowledge were 79.7%**.** Basic knowledge about the screening of cervical cancer is reported in **Table 4**. Only 31.1% of respondents had undergone cervical cancer screening. The dominant barriers were unawareness (35.7%) and carelessness/neglect (27.1%) Cervical cancer screening practice and barriers are recorded in **Table 5**.

There was a significant association of good knowledge concerning screening cancer of the cervix with living in urban areas (P= 0.013), being employed (p=0.043), education at the secondary and university level (p=0.001) and being a health professional (p<0.001). The relationship of different predictors with good knowledge of cervical cancer screening is recorded in **Tables 6-8**.

CHAPTER4. DISCUSSION

The aim of this study was to assess Rwandese women's knowledge and practice on cervical cancer screening as well as to find barriers to their screening. The results of this study demonstrated inadequate knowledge and limited health care seeking for prevention and screening of cervical cancer. Lack of awareness was shown to be women's biggest challenge. Being knowledgeable about cervical cancer symptoms and its screening contributes to the reduction of cervical cancer mortality.[18]

Our study showed poor knowledge concerning risk factors and symptoms of cancer of the cervix in 63.8% of women. Similar results were seen in studies performed in Indonesia and Pakistan in 2018 where 59% had inadequate knowledge about cervical cancer. [10,19] A study performed in Nigeria in 2014 illustrated that most of women had poor knowledge about cervical cancer.[20] In our study the majority of women (95.1%) had heard about cervical cancer. This is similar to studies in Uganda that found most of women had heard about cancer of the cervix (99.1% and 99.8%).[21,22] These results suggest that much effort is needed in community education on cervical cancer as most women have little knowledge beyond simply knowing that cervical cancer exists.

The current study showed poor knowledge of cervical cancer screening regarding prevention and screening methods in 79.1% women. This is similar to a study performed in Nepal where poor knowledge regarding screening of cervical cancer was in 87% women.[23] Other studies have shown variable results, such as southern Ethiopia where poor knowledge concerning cancer of the cervix screening was in 46.3% of women and 65.6% in Chitwan, Nepal.[24,25] This difference may be justified by the level of education of participants and settings of studies.[13] The source of information contributes variably to the prevention of cervical cancer in different populations. In our study, the first source of knowledge was the radio in 38.7% and health care providers' message in 29.4%. In Uganda the radio was a source of information to an even greater number of participants at 70.2% and health centers less, at 15.1%. This demonstrates the role of media in sensitization in developing countries with limited internet.[21,22]

A limited number of our study participants (31.1%) underwent cervical cancer screening. This is comparable to a previous Survey performed in Rwanda surveying midwives and nurses in 4 hospitals in Kigali.[26] The results showed that only 32.9% of these healthcare providers had ever

undergone a cervical cancer screening in their lifetime.[26] Similarly, in Ethiopia healthcare providers including doctors, nurses and midwives underwent screening at only 11.4%.[27] This shows decreased screening of cervical cancer in developing nations even in women with a high education level and medical knowledge. Our study found that lack of awareness and carelessness were the main reasons for women not attending screening facilities. This is similar to a study in Gabon in 2014 showing neglect as the main reason for not being screened.[13] In Nigeria, the main reasons were not being aware of the screening program in 91.4% and lack of symptoms in 15.9%.[15] In Ethiopia, a study found 56.3% did not know about screening of cancer of the cervix.[28] Collectively, these results support the need for education and public sensitization.

This study showed a significant association of good knowledge towards screening of cervical cancer with living in an urban area (P= 0.013). Similarly, in Nigeria urban residence was significantly associated with an increased level of knowledge of cervical cancer screening (P<0.05).[22] In Uganda, urban living was also associated with better knowledge of cancer prevention.[29] This demonstrates the need to address education on cervical cancer screening in our rural populations. We also found a significant association of good knowledge of cervical cancer screening with having employment (p=0.043), being educated from secondary school to university (p= 0.001) and being a healthcare professional (p <0.001). Similar result were found in Zanzibar which showed a significant association of screening knowledge with education level and family income (P= 0.000), as well as in Kenya and Pakistan.[10,12,30]

There were limitations to our study. The district hospitals studied were chosen out of convenience to the investigator and may not be generalized to the entire country. Cervical cancer screening knowledge, practice and barriers can be influenced by many factors that are not assessed in a simple questionnaire. Questionnaire structure may have also influenced the outcome for women who don't know to read and write. There was no standard knowledge assessment tool. The pilot test for validation of questionnaire was not done. There may have been respondent bias and recall bias as they survey was asking knowledge. Our study's strength was that it was performed in settings where screening services were available and women were interviewed at presentation, before consultation. This was the first study done in our country evaluating knowledge, practice of women and their barriers to screening of cancer of cervix.

Multiple outcomes were studied which could help decision making and change practice concerning screening of cervical cancer.

In conclusion, Rwanda women appear to have poor knowledge towards cancer of the cervix and its screening. Among greatest barrier lack of awareness is included. This requires more training about the prevention and screening of cervical cancer at the community and health facility levels. We recommend that health centers and district hospitals organize teaching sessions for patients on cancer of the cervix prevention and screening to upgrade knowledge and awareness. Further study is encouraged about acceptance of cervical cancer screening.

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TABLES

Table 1: Socio-demographic characteristics of the study participants

Variables	n	%
Age		
30-40 Years	252	65.6
41-50 Years	88	22.9
51-65 Years	44	11.5
Parity		
Nulliparous	44	11.5
Primiparous	50	13.0
Multiparous	290	75.5
Marital status		
Married	291	75.8
Single	36	9.4
Divorced	29	7.6
Widower	28	7.3
Religion		
Protestant	205	53.4
Catholic	135	35.2
Muslim	36	9.4
No religion	8	2.1
Occupation		
Self employed	132	34.4
Cultivator	100	26.0
Not employed	82	21.4
Public employed	70	18.2
Health profession		
Health professional	45	11.7
Non health professional	339	88.3

Education background		
None	30	7.8
Primary	140	36.5
Secondary	142	37.0
University	72	18.8
Hospital/Location		
Muhima hospital	204	53.1
Byumba hospital	180	46.9
District of residence		
Gicumbi	170	44.3
Nyarugenge	88	22.9
Gasabo	62	16.1
Kicukiro	36	9.4
Rulindo	15	3.9
Kamonyi	8	2.1
Burera	5	1.3
Distance to nearest health Facility		
1-5 km	274	71.4
6-10 km	79	20.6
11-15 km	31	8.1
Region		
Rural	114	29.7
Urban	270	70.3

Table 2: Knowledge of cervical cancer symptoms and risk factors

Variables	Yes [n (%)]	No [n (%)]
Knowledge about symptoms		
No symptoms at early stage	27 (7.0)	357 (93.0)
Abnormal vaginal bleeding	**217 (56.5)**	167 (43.5)
Postcoital bleeding	107 (27.9)	277 (72.1)
Vaginal foul- smelling discharge	130 (33.9)	254 (66.1)
Pelvic pain	214 (55.7)	170 (44.3)
I don't know	115 (29.9)	269 (70.1)
Knowledge about risk factors		
Multiple sexual partners	**187 (48.7)**	197 (51.3)
Early sexual intercourse	181 (47.1)	203 (52.9)
Human papillomavirus	87 (22.7)	297 (77.3)
Human Immunodeficiency virus	42 (11.0)	342 (89.0)
Inadequate screening	40 (10.4)	344 (89.6)
I don't know	142 (37)	242 (63.0)
Is cervical cancer curable?		
Yes [n (%)]	252	**65.6**
No [n (%)]	60	15.6
I don't know [n (%)]	72	18.8

Table 3: Information on cervical cancer

Variables	n	%
Women who have ever heard about cervical cancer		
YES	365	**95.1**
NO	19	4.9
Women who had heard about HPV as the cause of cervical cancer		
Yes	68	**17.7**
No	316	82.3
Source of information		
Radio	148	**38.5**
Health facility	113	**29.4**
Friends	28	7.3
Schools	15	3.9
I don't remember	4	1.0
Posters	3	0.8
Newspaper	2	0.5
Religious leader	2	0.5
Internet	2	0.5
No information	19	4.9

Table 4: Knowledge about cervical cancer prevention and screening

Variables	Yes [n (%)]	No [n (%)]
Information about cervical cancer prevention		
Vaccination against HPV	152 (39.6)	232 (60.4)
Avoid multiple sexual partners	**239 (62.2)**	145 (37.8)
Avoid early sexual intercourse	166 (43.2)	218 (56.8)
Regular cervical cancer screening	147 (38.8)	237 (61.7)
I don't know	94 (24.5)	290 (75.5)
Information about cervical cancer screening		
Heard about cervical cancer screening	**352 (91.7)**	32 (8.3)
Heard about HPV	68 (17.7)	316 (82.3)
Knowledge on screening methods		
Pap smear test	31 (8.1)	353 (91.9)
HPV testing	104 (27.1)	280 (72.9)
VIA or VIL test	**124 (32.3)**	260 (67.7)
I don't know	209 (54.4)	175 (45.6)
Able to define cervical cancer [n(%)]		
Test to detect precancerous changes	274	**71.4**
Test to help to treat cervical cancer	24	6.3
I don't know	86	22.4

Table 5: Practice and barriers to cervical cancer screening

Variables	n	%
Women who underwent cervical cancer screening in their life		
Yes	120	**31.3**
No	264	68.8
Frequency of screening		
Once	72	**18.8**
Twice	31	8.1
3 times	16	4.2
More than 3 times	1	0.3
Reasons for not attending the screening program		
Lack of awareness	137	**35.7**
Carelessness/Neglect	104	**27.1**
Lack of symptoms	87	**22.7**
Doctors not requesting the test	50	13.0
Being busy	39	10.2
Fear of vaginal examination	30	7.8
Long-distance to heath facility	14	3.6
Health providers not cooperative	11	2.9
Lack of money	8	2.1
Lack of support from partner	7	1.8
Lack of insurance	5	1.3
Service not easily available and expensive	3	0.8
Embarrassment	3	0.8

Table 6: Binary logistic regression on the association of residence and knowledge and practices

Outcomes	Residence		OR (95% CI)	P-value
	Urban	Rural (Ref)		
Knowledge of cervical cancer as a disease				
Good	99 (36.7%)	40 (35.1%)	1.07 (0.68-1.69)	0.769
Poor	171 (63.3%)	74 (64.9%)		
Knowledge of cervical cancer screening				
Good	64 (23.7%)	14 (12.3%)	**2.22 (1.18-4.14)**	**0.013**
Poor	206 (76.3)	100 (87.7%)		
Practice of cervical cancer screening				
Screened	83 (30.7%)	37 (32.5%)	0.92 (0.58-1.48)	0.74
Not screened	187 (69.3%)	77 (67.5%)		

Table 7: Binary logistic regression on the association of predictors and knowledge of cervical cancer screening

Predictors	Knowledge of cervical cancer screening		OR (95% CI)	P-value
	Good	Poor		
Age				
30-49 years	73 (21.8%)	262 (78.2%)		
50-65 years	5 (10.2%)	44 (89.8%)	0.41 (0.15-1.06)	0.067
Parity				
Nulli/Primipara	23 (24.5%)	71 (75.5%)		
Multipara	55 (19.0%)	235 (81.0%)	0.72 (0.41-1.26)	0.250
Marital status				
Married	68 (23.4%)	223 (76.6%)	2.53 (1.24-5.15)	**0.010**
Single	10 (10.8%)	83 (89.2%)		
Health profession				
Health professional	34 (75.5%)	11 (24.4%)	20.7 (9.7-43.8)	**<0.001**
Non-health professional	44 (13.0%)	295 (87.0%)		
Education				
None/Primary	10 (5.9%)	160 (94.1%)		
Secondary/university	68 (31.8%)	146 (68.2%)	7.45 (3.7-15.01)	**<0.001**
Occupation				
Cultivator	15 (8.2%)	167 (11.8%)		
Employed	63 (31.2%)	139 (68.8%)	5.04 (2.75-9.25)	**<0.001**
Distance to health facility				
≤5 km	63 (23.0%)	211 (77.0%)		
>5 km	15 (13.6%)	95 (86.4%)	0.52 (0.28-0.97)	**0.042**

Table 8: Multivariable analysis of the predictors of the knowledge of cervical cancer screening

Predictors	Knowledge of cervical cancer screening		Bivariate		Multivariable	
	Good	Poor	OR (95% CI)	P value	AOR OR (95% CI)	P value
Age						
30-49 years	73 (21.8%)	262 (78.2%)				
50-65 years	5 (10.2%)	44 (89.8%)	**0.41 (0.15-1.06)**	0.067	-	
Parity						
Nulli/Primipara	23 (24.5%)	71 (75.5%)				
Multipara	55 (19.0%)	235 (81.0%)	0.72 (0.41-1.26)	0.25	-	
Marital status						
Married	68 (23.4%)	223 (76.6%)	2.53 (1.24-5.15)	0.01	-	
Single	10 (10.8%)	83 (89.2%)				
Health profession						
Health professional	34 (75.5%)	11 (24.4%)	20.7 (9.7-43.8)	<0.001	10.5 (4.7-23.6)	**<0.001**
Non health professional	44 (13.0%)	295 (87.0%)				
Education						
None/Primary	10 (5.9%)	160 (94.1%)				
Secondary/university	68 (31.8%)	146 (68.2%)	7.45 (3.7-15.01)	<0.001	0.27(0.13-0.58)	**0.001**
Occupation						
Cultivator	15 (8.2%)	167 (11.8%)				
Employed	63 (31.2%)	139 (68.8%)	5.04 (2.75-9.25)	<0.001	0.49(0.25-0.98)	**0.043**
Distance to health facility						
≤5 km	63 (23.0%)	211 (77.0%)				
>5 km	15 (13.6%)	95 (86.4%)	0.52 (0.28-0.97)	0.042	-	

APPENDICES

APPENDIX1. INFORMED CONSENT

CONSENT FOR PARTICIPATING IN A STUDY

Consent for participating in this study "**Assessment of knowledge, practice and barriers to cervical cancer screening in women attending outpatient at district hospitals Muhima and Byumba.** Respondent number: …….

This study is intended to know level of knowledge, practice and barriers to women on cervical cancer screening in rural and urban area.

To participate in this study is voluntary. There is no money paid to the participants or other benefits. The information given will be used for population education and will be kept confidential. The participation in this study will not cause any harm to you.

I understand well the above given explanations; and I have had an opportunity to ask questions.

Do you agree to participate in this study? YES NO

Participant Initials……

Date……/……/……

Researcher

Names: ……. Signature: ……

Who to contacts

If any question and concern for this study please contact:

Dr David TUYISENGE: Principal investigator, 0783424042,daoudliv@gmail.com

Dr Lisa Bazzett- MATABELE Supervisor, Tel: 0784442447, email:lbazzett@me.com

Dr Diomede NTASUMBUMUYANGE,Supervisor,Tel:0788334988,email:muyangediomede@gmail.com

AMASEZERANO YO KWINJIRA MU BUSHAKASHATSI KU BUSHAKE

Inyito y'ubushakashatsi: "**Assessment of knowledge, practice and barriers to cervical cancer screening in women attending outpatient at district hospitals Muhima and Byumba"** Numero y'usubiza: ……

Ubu bushakashatsi bugamije kumenya ubumenyi ,imyitwarine ndetse n'imbogamizi ababyeyi fatite mukwiuzumisha canseri y.inkondo y.umura kubivuza bataha ku bitara bya Muhima na Byumba mu mujyi no mu cyaro .

Kujya muri ubu bushakashatsi ni ubushake, nta mafaranga cg ikindi gihembo bihabwa ababujyamo. Ibizava muri ubu bushakashatsi bizatangazwa mu rwego rwo kwigisha abaturage kandi amakuru yose batanze azagirwa ibanga. Kujya muri ubu bushakashatsi nta bibazo bizatera uwemeye kubujyamo.

Numvise neza ibisobanuro nahawe ndetse nahawe umwanya wo kubaza ibibazo.

Uremera kujya mu bushakashatsi? YEGO OYA

Amazina y'ubazwa: ……

Italiki: ……/……/……

Uhagarariye ubushakashatsi

Amazina…….

Umukono……..

Abo wabaza ukeneye ibisobanuro

Ku bindi bisobanuro cyangwa ibibazo kuri ubu bushakashatsi mwahamagara:

Dr David TUYISENGE: Principal investigator, 0783424042,daoudliv@gmail.com

Dr Lisa Bazzett MATABELE Supervisor, Tel: 0784442447, email:lbazzett@me.com

Dr Diomede NTASUMBUMUYANGE supervisor,Tel:0788334988,email:muyangediomede@gmail.com

APPENDIX2. DATA COLLECTION TOOL

QUESTIONNAIRE/IBIBAZO

1. Demographic data/imyirondoro

1	Age /imyaka	
2	Parity/imbyaro	Null parity/ntarabyara 1/yabaye rimwe Multiparity/yabaye kenshi
3	Area/aho atuye	Rural/mucyaro Urban/mu mujyi
4	Marital status/irangamimerere	Single/ingaragu Married/arubatse Divorced/baratandukanye Widower/umupfakazi
5	Religion/idini	Catholic/gaturika Protestant/poroso Muslim/umusilamu Others/ayandi No religion/ntadini
6	Occupation/umwuga	Cultivator/umuhinzi Self employed/arikorera Public employed/akorera leta Non employed/ntakazi afite
7	Health service/urwego rw'ubuzima	Health professional/Akora kwa muganga Non health professional/ntakora kwa muganga
8	Education/amashuli	None/ntayo

		Primary/abanza High school/ayisumbuye University/kaminuza
9	Economical status/icyiciro cy,ubudehe	Cat I/icyiciro cya i Cat ii/icya ii Cat iii/icya iii Cat iv/icya iv
10	Location/aho abarizwa	Village/umudugudu /akagali
11	Distance to health facility/km/urugendo kugera kwamuganga mu birometero	

2. General Knowledge on cervical cancer /ubumenyi rusange kuri cancer y,inkondo yumura

1	Have you ever heard about cervical cancer?/wigeze wumva bavuga kuri cancer y,inkondo yumura	Yes/yego No/oya
2	Where did you first learn about cervical cancer/nihe wumvise bigisha kuri kanseri y,inkondo yumura	News media(radio,TV)/radiyo na televisiyo Internet/interineti Printed materials(posters, brochures)/ku mpapuro Health workers' message/abakozi bo kwa muganga Friends (family, colleague)/inshuti

		Teacher /mwarimu Religious leaders/murusengero others/ahandi
3	What are symptoms of cervical cancer/nibihe bimenyeto bya kanseri y'inkondo yumura	Vaginal bleeding/kuva amaraso mu gitsina Vaginal foul-smelling discharge/amatembabuzi adahumura neza Pelvic pain/kubabara mukiziba cy'inda No symptoms at early stage/ntakimenyetso nakimwe igitangira Don't know/ntabyo nzi Other/ibindi
4	What are risk factors of cervical cancer/nizihe mpamvu zitera kanseri y,inkondo y,umura	Having multiple sexual partners/kugira abagabo benshi Early sexual intercourse/gutangira imibonano mpuzabitsina ukiri muto Human papillomavirus/virus ya papilloma HIV/ ubwandu bwa sida Cigarette smoking/kunywa itabi Others/ibindi I don't know/ntabyo nzi
5	Can cancer of the cervix be cured/ese kanseri yinkondo yumura yavurwa igakira	Yes/yego No/oya Don't know/ntabyo nzi

3. Knowledge on cervical cancer screening/ubumenyi mu kwisuzumisha kanseri y,inkondo y'umura

1	Have you ever heard about cervical cancer screening/wigeze wumva aho bavuga ibyo kwisuzumisha cancer yinkondo y'umura	Yes/yego No/oya
2	How can a person prevent getting cervical cancer/wakirinda gute kanseri y'inkondo y'umura	Vaccination of HPV/kwikingiza virusi ya papilloma Avoid multiple sexual partners/kwirinda ubusambabyi Avoid early sexual intercourse/kwirinda imibonano mpuzabitsina ukiri muto Quit cigarette smoking/kureka itabi Regular cervical cancer screening/kwisuzumisha kare Don't know/simbizi Others/ibindi
3	Where did you hear about cervical cancer screening from?wumvise here ibyo kwisuzumisha kanseri y'inkondo yumura	Radio/radiyo Tv/televisiyo Posters/ibinyamakuru byo kunzira Health facility/kwa muganga Village leaders/munzego zibanze Friends/inshuti News papers/mubinyamakuru

		Schools/mwishuli Don’t know/simbizi Others/ahandi
4	What do you mean by cervical cancer screening/wumvute iyo bavuze kwisuzumisha	Test to help to detect precancerous change in cervix/ikizami gikorwa ngo hamenyekane uburwayi hakiri kare Test to help to treat cervical cancer/ikizami gikorwa mukuvura iyo kanseri Don’t know/ntabyonzi
5	What is the age of the woman to start cervical cancer screening/niyihe myaka yo gutangira kwisuzumisha kanseri y’inkondo y,umura	21 years/imyaka21 30 years/imyaka 30 Other/indi
6	How frequent should screening be done/kwisuzumisha bikorwa mugihe kingana iki	Annually/buri mwaka 3yearly/buri imyaka 3 5yearly/buri myaka 5 Others/ibindi
7	Which test used to detect cervical cancer/nibihe bizami byerekana kanseri y’inkondo y’umura	Pap smear test Cytological screening /VIA test HPV testing/kwisuzumisha virus ya papailloma Don’t know/sinzi
8	When should a woman stop having cervical cancer screening/niryari umunyeyi ahagarika kwizumisha	50 years/kumyaka 50 65 year/kumyaka 65 75years/kumyaka 75 Don’t know/sinzi

4. Practice and barriers of cervical cancer screening/imigenzerez ndetse n'impavu zituma utasuzumisha kanseri y'inkondo y'umura

1	Have you ever underwent cervical cancer screening/wigeze wishuzumisha kanseri y'inkondo 'umura	Yes/yego No/oya
2	If yes, how many times did you screen/niba yego,incuro zingahe	One time/incuro imwe Two time/incuro ebyiri Three time/incura 3 More than three/zirenze eshatu
3	If no what is the reasons/niba oya nizihe mpamvu zituma utisuzumisha?	Embarrassment/gusuzugurika Lack of any symptoms/ntabimenyetso Lack of awareness and counseling/ntabwo mbizi sinasobanuriwe Being busy/mba mpuze Carelessness/simbyitaho Fear of vaginal examination/ntibya gusuzumwa mugitsina Lack of encouragement of partner/uwo twashakanye ntamfasha Long distance to health facility/urugendo rurerure rugera kwa muganga Doctor does not request

		/muganga ntabidusaba Health personnel are not cooperative/abaganga ntibatwitaho Lack of money/ntamafaranga Not easily available and expensive/ubwo buvuzi ntibuboneka kandi burahenze Lack of insurance/ntabwisungane mukwivuza

END! umusozo

Thank you/ murakoze

APPENDIX 3.IRB APPROVAL

UNIVERSITY of RWANDA

COLLEGE OF MEDICINE AND HEALTH SCIENCES

DIRECTORATE OF RESEARCH & INNOVATION

CMHS INSTITUTIONAL REVIEW BOARD (IRB)

Kigali, 23rd /August/2019

Dr David TUYISENGE
School of Medicine and Pharmacy, CMHS, UR

Approval Notice: No 426/CMHS IRB/2019

Your Project Title *"Assessment Of Knowledge, Practice And Barriers To Cervical Cancer Screening In Women Attending Outpatient At District Hospital Muhima And Byumba."* has been evaluated by CMHS Institutional Review Board.

Name of Members	Institute	Involved in the decision		
		Yes	No (Reason)	
			Absent	Withdrawn from the proceeding
Prof Kato J. Njunwa	UR-CMHS	X		
Prof Jean Bosco Gahutu	UR-CMHS	X		
Dr Brenda Asiimwe-Kateera	UR-CMHS	X		
Prof Ntaganira Joseph	UR-CMHS	X		
Dr Tumusiime K. David	UR-CMHS	X		
Dr Kayonga N. Egide	UR-CMHS	X		
Mr Kanyoni Maurice	UR-CMHS		X	
Prof Munyanshongore Cyprien	UR-CMHS	X		
Mrs Ruzindana Landrine	Kicukiro district		X	
Dr Gishoma Darius	UR-CMHS	X		
Dr Donatilla Mukamana	UR-CMHS	X		
Prof Kyamanywa Patrick	UR-CMHS		X	
Prof Condo Umutesi Jeannine	UR-CMHS		X	
Dr Nyirazinyoye Laetitia	UR-CMHS	X		
Dr Nkeramihigo Emmanuel	UR-CMHS		X	
Sr Maliboli Marie Josee	CHUK	X		
Dr Mudenge Charles	Centre Psycho-Social	X		

After reviewing your protocol during the IRB meeting of where quorum was met and revisions made on the advice of the CMHS IRB submitted on 16th August 2019, **Approval has been granted to your study.**
Please note that approval of the protocol and consent form is valid for **12 months.**

Email: researchcenter@ur.ac.rw P.O Box 3286 Kigali, Rwanda www.ur.ac.rw

You are responsible for fulfilling the following requirements:

1. Changes, amendments, and addenda to the protocol or consent form must be submitted to the committee for review and approval, prior to activation of the changes.
2. Only approved consent forms are to be used in the enrolment of participants.
3. All consent forms signed by subjects should be retained on file. The IRB may conduct audits of all study records, and consent documentation may be part of such audits.
4. A continuing review application must be submitted to the IRB in a timely fashion and before expiry of this approval
5. Failure to submit a continuing review application will result in termination of the study
6. Notify the IRB committee once the study is finished

Sincerely,

Date of Approval: The 23rd August 2019

Expiration date: The 23rd August 2020

Professor GAHUTU Jean Bosco
Chairperson Institutional Review Board,
College of Medicine and Health Sciences, UR

Cc:

- Principal College of Medicine and Health Sciences, UR
- University Director of Research and Postgraduate Studies, UR

APPENDIX4. DISTRIC HOSPITALS APPROVAL

REPUBLIC OF RWANDA

Kigali, October 28th 2019

KIGALI CITY
NYARUGENGE DISTRICT
MUHIMA HOSPITAL
P.O. BOX 2456 KIGALI
Tél. /Fax : +252 50 37 7
E-mail : muhima.hospital@moh.gov.rw

TUYISENGE David

Re: Your request to conduct a study

Dear David

Reference made to your letter received on 9th October 2019 request to conduct a study entitled: *Assessment of knowledge, practice and barriers to cervical cancer screening in women attending outpatients at* Muhima District hospital;

I would like to inform you that your request is approved and at the end the administration of Muhima hospital shall need to be given the final report of your study.

Yours sincerely,

MUHIMA HOSPITAL - ETHIC COMMITTEE -

MANIRAGUHA YEZE Aimée Victoire

Chief Ethic Committee

Cc:
- Clinical Director
- Director of Nursing

REPUBLIC OF RWANDA

Gicumbi, 29/1/2020

N° 20/119/BYDH/DG/2020

GICUMBI DISTRICT

BYUMBA DISTRICT HOSPITAL

Director General's Office

Dr TUYISENGE David

Tel:0783424042

Dear Sir,

RE: Your request to conduct a study

Reference made to your letter received on 15th October, 2019 requesting to conduct the study entitled "**Assessment of knowledge, practice and barriers to cervical cancer screening in women attending outpatient at Byumba District Hospital**".

I would like to inform you that your request is approved and at the end the administration of Byumba Hospital shall need the final report of your study.

Yours sincerely.

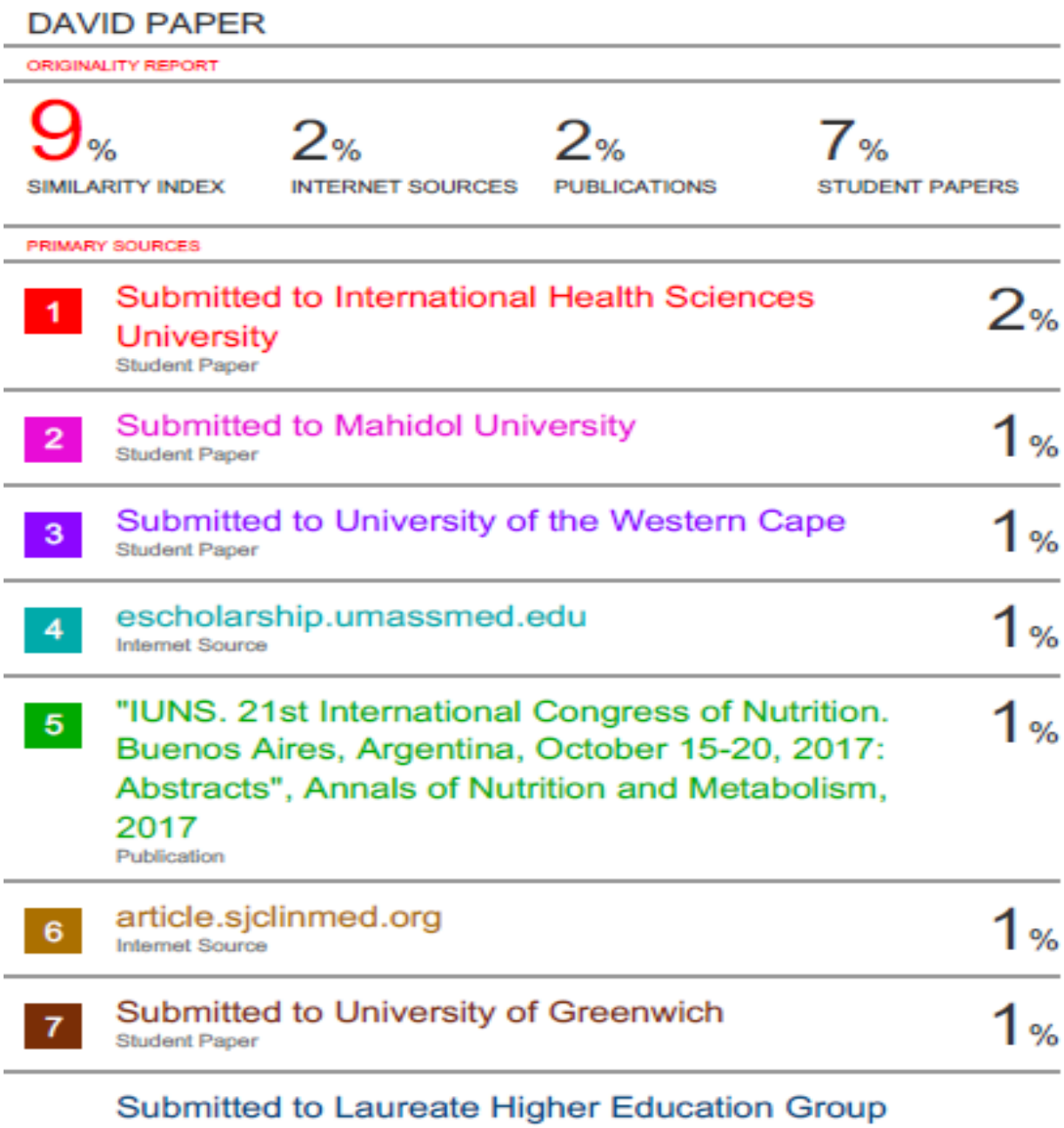
MINISTRY OF HEALTH - BYUMBA DISTRICT HOSPITAL

Dr NTIHABOSE Corneille Killy

Director General of Byumba District Hospital

APPENDIX5. ANTI-PLAGIARISM CHEKING

“ASSESSMENT OF THE KNOWLEDGE, PRACTICE AND BARRIERS TO CERVICAL CANCER SCREENING IN WOMEN ATTENDING OUTPATIENT AT DISTRICT HOSPITAL MUHIMA AND BYUMBA”.



DAVID PAPER

ORIGINALITY REPORT

9%	2%	2%	7%
SIMILARITY INDEX	INTERNET SOURCES	PUBLICATIONS	STUDENT PAPERS

PRIMARY SOURCES

1	Submitted to International Health Sciences University Student Paper	2%
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