



UNIVERSITY *of*
RWANDA

**CAUSES OF DELAYED CONSULTATION FOR INFERTILITY
AMONG WOMEN ATTENDING PUBLIC REFERRAL HOSPITALS
OF KIGALI.**

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Master of Medicine in Obstetrics and Gynecology

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By

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A Dissertation submitted in partial fulfilment of the requirements for
the Degree of Master of Medicine in Obstetrics and Gynecology.

In College of Medicine and Health Sciences

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November 2021

CERTIFICATION FOR AWARD

The undersigned certify that they have read and hereby recommend for acceptance by the University of Rwanda a dissertation entitled “**causes of delayed consultation for infertility among women attending public referral hospitals of kigali.**”

in partial fulfilment of the requirements for the Degree of Master of Medicine (Obstetrics and Gynecology) of the University of Rwanda.

DECLARATION AND COPYRIGHT

I, Francois Sebashi declare that this dissertation is my own original work except where specifically acknowledged and it has not been presented to any other University for similar or any other degree award.

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Date.....

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Thank you to my colleagues, residents from obstetrics and gynecology department

Thank you colleagues' midwives

Thank you to my family.

I thank the Almighty God

DEDICATION

To my lovely wife Diane Abewe for being always with me and encouraging me during the whole process of this research.

To my sons Tim Henrick Mugisha, Tom Heinz Mucyo and Timeo Helmuth Murinzi

I dedicate this work.

ABSTRACT

Background Delay to consult for infertility leads to lower chances of getting pregnant. This study was aimed to identify the causes of delay to seek for medical attention for infertility among Rwandan women attending the University Teaching Hospitals of Kigali.

Methods We have conducted a cross-sectional study, data were collected for a period of three months on patients consulting outpatient at University Teaching Hospital of Kigali (CHUK) and Rwanda Military Hospital (RMH) selected by simple random sampling. Delay to consult was defined as consulting for infertility at least six months after meeting WHO definition. Multivariable models were used to examine the factors of delay to consult.

Results The prevalence of women consulting for infertility was 20.5%. Two third of participants had delayed to consult for infertility. Factors associated with delay to consult were: advanced maternal age (OR: 2.177, 95%CI:1.245-3.806, p=0.006), having primary education (OR: 2.31, 95%CI: 1.06-5.034, p=0.035), having no occupation (OR: 3.115, 95%CI: 1.182-8.209, p=0.022). Farmers and women owning a business were also more likely to have delayed consultation (OR: (2.889, 95%CI: 1.113-7.496, p=0.029 and OR: 2.687, 95%CI: 1.08-6.686, p=0.034 respectively). Women who had an unintended pregnancy on most recent pregnancy had higher odds of delaying to consult when infertility emerges (OR: 3.317, 95%CI: 1.247-8.826, p=0.013), similar to women for whom the pregnancy resulted into a live birth (OR: 3.649, 95%CI: 1.53-8.704, p=0.003).

Conclusion Infertility services with special consideration for women with advanced maternal age and women with lower educational level is needed (These groups have a delayed utilization of healthcare services. Again, health education to couple is needed to explain to the community about their right to use existing healthcare services.

LIST OF ACCRONYMS.

ART	: Assisted Reproductive Technology
CHUK	: University Teaching Hospital of Kigali (Centre Hospitalier Universitaire de Kigali)
HPO	: Hypothalamic-Pituitary-Ovarian
ICSI	: Intra Cytoplasmic Sperm Insemination
IVF	: In Vitro Fertilization
RMH	: Rwanda Military Hospital
UK	: United Kingdom
UR	: University of Rwanda
US	: United State
WHO	: World Health Organization

Table of Contents

CERTIFICATION FOR AWARD	II
DECLARATION AND COPYRIGHT	III
ACKNOWLEDGEMENTS	IV
DEDICATION	V
ABSTRACT	VI
LIST OF ACCRONYMS.....	VII
I. INTRODUCTION	1
1.1. BACKGROUND.....	1
1.2. RESEARCH QUESTION:	2
1.3. OBJECTIVES.....	2
II. METHOD	4
2.1. STUDY DESIGN:	4
2.2. STUDY AREA AND POPULATION:	4
2.1.1. <i>Inclusion criteria:</i>	4
2.1.2. <i>Exclusion criteria:</i>	4
2.3. DATA COLLECTION AND ANALYSIS:	4
2.5. SAMPLING DESIGN.....	5
2.6. STUDY VARIABLES.....	5
2.7. ETHICAL CONSIDERATION	5
III. RESULTS	6
3.1. PREVALENCE OF WOMEN CONSULTING FOR INFERTILITY	6
SOCIODEMOGRAPHIC CHARACTERISTICS.....	6
OBSTETRIC BACKGROUND OF THE STUDY PARTICIPANTS	7
3.2. DELAY TO CONSULT FOR INFERTILITY AND FACTORS ASSOCIATED DELAYING	9
3.2.1. SOCIODEMOGRAPHIC FACTORS	10
3.2.2. OBSTETRIC FACTORS ASSOCIATED WITH DELAY TO CONSULT	12
IV. DISCUSSION	13
V. CONCLUSION AND RECOMMENDATION	15
LIMITATION OF THE STUDY:	15
ANNEX	18
ANNEX 1. QUESTIONNAIRE	18
ANNEX 2. ETHICAL APPROVAL	20
ANNEX 3: CONSENT FORM	26

LIST OF TABLES

Table 1. Sociodemographic characteristics.....	7
Table 2. Obstetric history.....	8
Table 3. Recent pregnancy.....	8
Table 4. Infertility awareness and seeking for care.....	9
Table 5. Sociodemographic factors associated with delays.....	11
Table 6. Obstetric factors associated with delay to consult.....	12

LIST OF FIGURES

Figure 1. Prevalence of infertility cases	6
Figure 2. Prevalence of delays for consultation	9
Figure 3. Participants' response on reasons for delaying to consult.....	10

I. INTRODUCTION

1.1. Background

Infertility is clinically defined as Inability to conceive after 12 months of regular intercourse without use of contraception in women aged less than 35 years, or, after 6 months in women aged 35 years or more(1–3). Worldwide, about 15 percent of couples are facing difficulties in conceiving and despite regular and unprotected intercourses, they end up having difficulty to achieve a pregnancy. Different conditions contribute to the infertility of the couple, and can be grouped into female factor, male factor and combined factors.

Different from most of other medical conditions, infertility does not involve only one person but rather involves a couple given the necessity of coupling between a male and female to create successful embryo(4). Infertility is considered as a disease and a public problem affecting up to 15% of couples worldwide and also has been ranked by World Health Organization (WHO) as the 5th highest global disability among women aged under 60 years(2,5–7).

Studies show that one in every seven couples in UK has infertility while one in every three women couples had infertility in a population based study in Nigeria(7,8). A systematic review on the prevalence of infertility across the world has demonstrated that infertility was lowest in Rwanda, Kenya and Zimbabwe compared to other African countries and the rate of primary infertility in these countries was less 1-1.1%(4). The prevalence of secondary infertility in Rwanda was <6%, similar to the prevalence in the United States (US) and Egypt(4).

There may be many factors contributing to infertility in a couple and some of them can be detected if a complete history and physical exam is done but, most of the times, there is a need for laboratory investigations and imaging to confirm the diagnosis(1,9). These factors, when detected early, can be managed and the chances of pregnancy are higher compared to when they are detected at advanced age since maternal age is very critical and a limiting factor in infertility management (9,10). It is documented that, as the woman ages above 34 years of age, her ability to conceive and carry pregnancy to viability decreases(1,11). Therefore, early consultation and evaluation for infertility should be taken by couples seeking for parenthood before attaining an advanced age. Unfortunately, due to the high costs demanded by fertility evaluation and management technologies such as in vitro fertilization (IVF) and ICSI (Intra Uterine Sperm Insemination), many young couples do not afford the costs and hence, they need to secure a financial saving which turns the woman into an advanced maternal age before she can afford the therapy(12). In addition, many

couples try other modalities such as traditional medicine and religious belief with hope to get a natural pregnancy with eventual delay in seeking for medical attention(10,13).

Additionally, skilled medical personnel and gynecologists that can manage well the infertility are not enough and this is a common problem especially in developing countries and most of the times are based in town , and patients have to travel long distances to reach to them and are constrained by the long journey of fertility investigation and management.

This study was conducted to assess the causes of delay in consulting for couples affected by infertility.

This study is important because it helped to assess the factors that have contributed to the delay in consulting for couples affected by infertility in Rwanda

This study is very important because it is the first one to be conducted for this purpose in Rwanda and its findings will help to put in place mechanisms that will help for timely evaluation and management in couples that are affected by infertility.

To date, little is known about the causes of delay in consulting for infertility among affected couples in Rwanda. That is why this study was conducted in order to respond to this question about factors that are causing infertile couples to delay in consulting for their infertility condition.

The findings from this study will help decision makers, public health planners and clinicians to know the cause of delay in consulting for infertility among affected couples and to formulate the strategies that will facilitate those affected couples to receive timely assessment and management of their infertility condition.

1.2. Research question:

- What are the factors hindering early consultation for infertility among Rwandan infertile couples?

1.3. Objectives.

General objectives:

- To assess the factors hindering early consultation for infertility among Rwandan women

Specific objectives:

- To evaluate the prevalence of patients consulting for infertility in Rwandan public referral Hospital.

- To evaluate the prevalence of delays in consulting for infertility at referral hospital
- To assess the factors associated with delay to consult for infertility

II. METHOD

2.1. Study design:

This was a cross sectional prospective study of which data were be collected for period of 3 months from April 2021 to June 2021

2.2. Study area and population:

Kigali University teaching hospital is a public tertiary hospital that has specialized services including Gynecology and Obstetrics and receive referrals from 29 district hospitals. Rwanda military hospital *RMH* is public military hospital that has a public infertility clinic and receive referrals from across the country especially from the eastern province. We identified those two centers as good places for gathering data on couples who present with infertility condition. We enrolled all patients consulting for infertility in outpatient at the University Teaching Hospital of Kigali (CHUK), and Rwanda Military Hospital (RMH). The study population were women consulting for infertility purpose the main diagnosis (either primary or secondary infertility), who sought for medical care. In this study, we define a delay to consult for infertility as a delay to consult for at least six months or more after the woman meets the WHO definition for infertility.

2.1.1. Inclusion criteria:

- Patients consulting for infertility and meeting the study definition of “clinical infertility” as defined by WHO.
- Being aged between 18 years and above.

2.1.2. Exclusion criteria:

- Women in critical condition not able to consent for the study
- Women with physical and mental disabilities that cannot willfully consent for participation in the study.
- Women who refused to participate in the study
- Women who are not affected by infertility

2.3. Data collection and analysis:

Data were collected using a questionnaire after signing an informed consent form. Data were entered and analyzed using the SPSS software version 25. During inferential statistics, an association were considered significant if the p-value is less than 0.05.

2.4. Sample size

The sample size was calculated based on the initial review of number of infertility cases that attended our study sites in the 3 months prior to our data collection. The total population size was 685 consultations at CHUK and RMH combined. The Yamane formula was applied using this population size (685), margin error of 0.05 and confidence level of 95%, a sample of 253 women was obtained and recruited to participate in the study. Three questionnaires were rejected due to missing information on large number of critical questions and hence 250 participants were used in the data analysis.

2.5. Sampling design

A random sampling was used in our study after which, a participant was repartitioned in the “Delay group” or “No-delay group” after clinical history in favor of delay or no delay to consult. Midwives working in outpatient department were trained as data collectors. After a clinical diagnosis of infertility was made by a doctor, the midwife introduced the study to the woman and asked her to be part of the study. If a woman agreed, a consent form was signed and she was enrolled in the study to fill the questionnaire.

2.6. Study variables

- Social demographic (Age, gender, district, wealth index, level of education, occupation, marital status)
- Causes of delay
- Social barriers during the consultation process (Partner, parents, neighbors, community around, traditional medicine)
- Economic impact (how economy affected the process of consultation)
- Patient awareness of diagnosis before reaching tertiary care level.
- Cause and motivation of transfer to referral hospital

2.7. Ethical consideration.

Ethical approval to conduct this study was obtained sought from the University of Rwanda before conducting this study and a permission for data collection were obtained from the ethic committee of CHUK, and RMH. Given that the information from participants is sensitive, breach of confidentiality was mitigated eliminating participant’s identification on the questionnaire, keeping the participant’s responses confidential to the researcher and keeping the questionnaire in a safe locked space where only the team of researchers can have access to them. A unique study ID was given to a questionnaire and it has no link to the patient identifiers or medical registration number.

III. RESULTS

3.1. Prevalence of women consulting for infertility

During our study period, a total of 3876 women consulted the outpatient department of obstetrics and gynecology department at CHUK (1863) and RMH (1813). Figure 1 represent the overall prevalence of infertility cases and prevalence per site. The overall prevalence of women consulting for infertility at both institutions was 796 (20.5%), divided as 98 (5.3%) at CHUK and 698 (38.5%) of total consultations in obstetrics and gynecology departments at RMH.

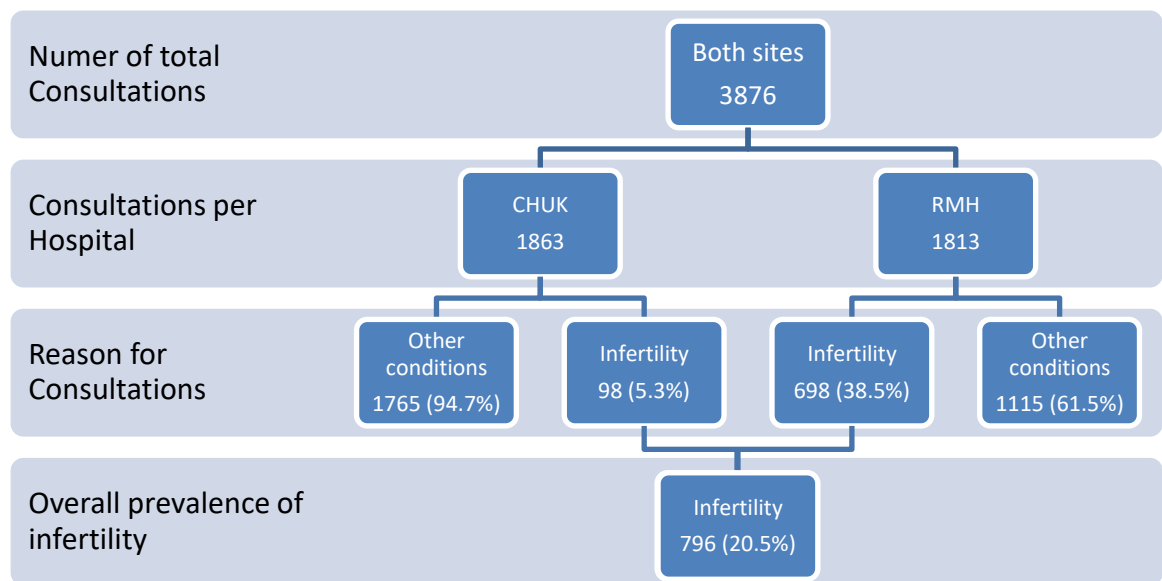


Figure 1. Prevalence of infertility cases

Sociodemographic characteristics

During this study, a total of 250 women consulting for infertility services were sampled and included. As shown in table 1 representing the sociodemographic characteristics of study participants, the majority were young women aged less than 35 years (53.2%) while advanced maternal age was represented at 46.8%. The majority (60.8%) were recruited from RMH and all the provinces in the country were represent with the capital city of Kigali being the most represented by 54% of all participants. Regarding the level of education, 43.2% had attended only the primary school followed by 37.2% who had attended secondary school. Furthermore, 10 (4.0%) of all participants had no formal education. By the time data collection, 78.4% of all participants were legally married and the remaining were women cohabitating with their male partners. Regarding the occupation and source of financial income, the biggest number of women in this study owned a business (34.8%) followed by peasant farmers (26.8%) while public servant were the least represented (4.0%). On the other

hand, one fourth of the respondents were women with no occupation (24.8%) and more than half (55.6%) were in category III of wealth index.

Table 1. Sociodemographic characteristics

		N	%
Age group	< 35 years	133	53.2
	≥35 years	117	46.8
Province	Kigali	135	54.0
	West	18	7.2
	East	49	19.6
	North	28	11.2
	South	20	8.0
Hospital site	CHUK	98	39.2
	RMH	152	60.8
Level of education	Non formal education	10	4.0
	Attended primary school	108	43.2
	Attended secondary school	93	37.2
	Attended university	39	15.6
Marital status	Cohabitate	54	21.6
	Married	196	78.4
Occupation	No occupation	62	24.8
	Farmer	66	26.4
	Owens a business	87	34.8
	Public servant	10	4.0
	Employed in private sector	25	10.0
Current Wealth index	Category I	13	5.2
	Category II	95	38.0
	Category III	139	55.6
	Category IV	3	1.2

Obstetric background of the study participants

The obstetrical background of the participants in this study is represented in table 2 and 3. Among the participants in this study, 51.6% had never been pregnant (nulligravida), 26% had been pregnant only once and 22.4% had had at least two pregnancies. In addition, 24.4% had had an abortion at least once, and 72.4% had no living child by the time of data collection. The majority of respondents indicated that their most recent pregnancy was intended (66.1%) and resulted into a miscarriage among 52.9%. The youngest live child for 53.4% was a female.

Table 2. Obstetric history

	0	1	≥2
	N (%)	N (%)	N (%)
Gravidity	129 (51.6)	65 (26)	56 (22.4)
Term	179 (71.6)	45 (18)	26 (10.4)
Preterm	247 (98.8)	2 (0.8)	1 (0.4)
Abortion	184 (73.6)	47 (18.8)	19 (7.6)
Living children	181 (72.4)	46 (18.4)	23 (9.2)

Table 3. Recent pregnancy

	Variable (N=117)	N	%
Recent pregnancy outcome	Miscarriage	64	52.9
	Live birth	57	47.1
Pregnancy intention on the most recent pregnancy	Intended	80	66.1
	Unintended	41	33.9
Gender of your youngest child?	Female	39	53.4
	Male	34	46.6

The participants in this study were asked how they learned about their infertility and represented in table 4. The majority (88.8%) have learned about having infertility from their own perception after failing to conceive, 15.6% were diagnosed and informed by a healthcare provider, and 4.4% had not thought they were having infertility until their male partner and friends told them after discussing their situation. By the time of data collection, 58% of the participants had consulted a district hospital for infertility, 54% had consulted a referral hospital and 49.6% had consulted a health center. Furthermore, 9.2% and 6% had consulted their friends and parents respectively while 12.8% and 19.6% had consulted religious attending and traditional medicine respectively for infertility treatment.

Table 4. Infertility awareness and seeking for care

	Yes	
	N	(%)
Learning about infertility		
After failing to conceive, I thought I maybe having infertility	222	(88.8)
I explained to a healthcare provider and he/she told me I have infertility	39	(15.6)
My partner told me that I may be having infertility	8	(3.2)
My relative / friends who know my story, they told me I have infertility	3	(1.2)
Consultation for infertility		
Never consulted for infertility purpose before	2	(0.8)
I have consulted my friend	23	(9.2)
My parents	15	(6.0)
Religious attending	32	(12.8)
Traditional medicine	49	(19.6)
Health center	124	(49.6)
District Hospital	145	(58.0)
Tertiary hospital	135	(54.0)
Private clinic	68	(27.2)
I have consulted abroad for infertility	1	(0.4)

3.2.Delay to consult for infertility and factors associated delaying

Two thirds (69%) of the participants in this study had delayed to consult for infertility, defined as a delay to make the first consult for more than 6 months after meeting the criteria for clinical infertility (figure 1).

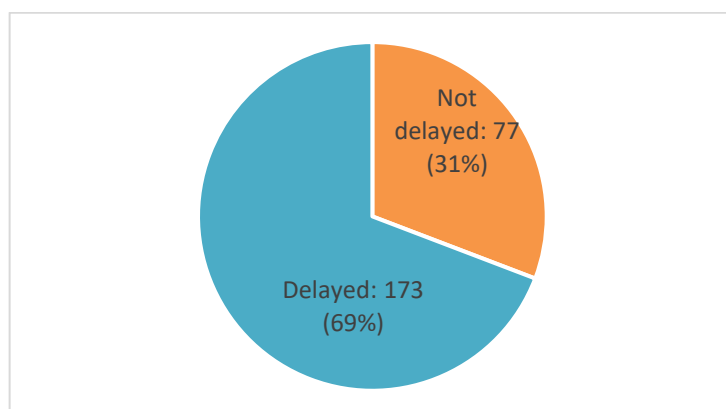


Figure 2. Prevalence of delays for consultation

Participants were asked about possible factors hindering early consultation for infertility and the responses are displayed in figure 2. The most highlighted reason for delaying was the lack of information that the condition can be treated (39.1%) followed by lack of money (30.6%). Lack of husband's support was mentioned by 12.9% while traditional medicine was mentioned by 25.4%. Furthermore, 21% highlighted that women attend religious activities with hope to activate their fertility and, hence, they seek for medical care after a delayed period.

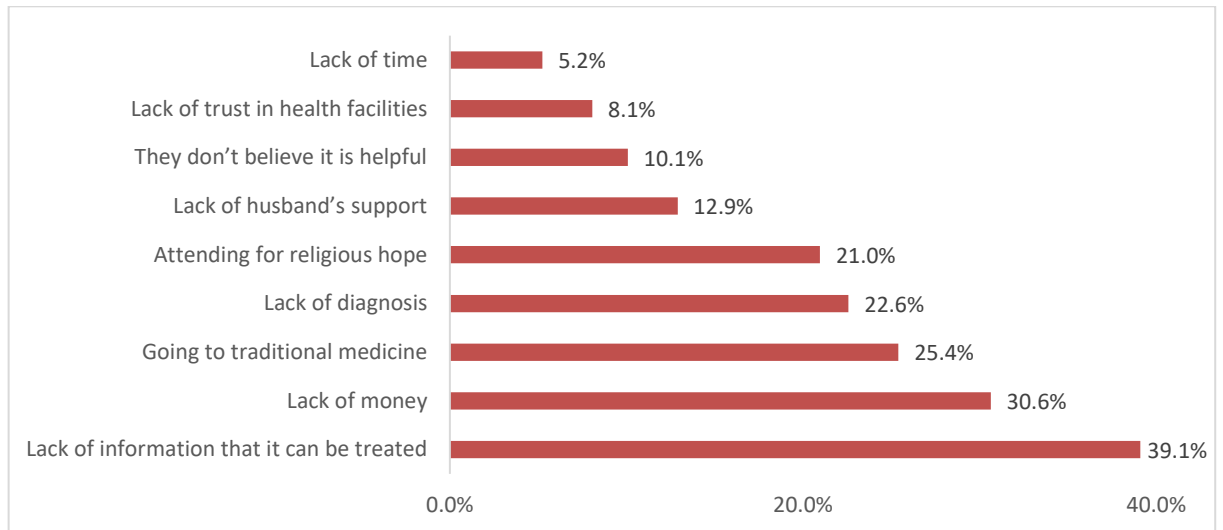


Figure 3. Participants' response on reasons for delaying to consult

3.2.1. Sociodemographic factors

Sociodemographic factors associated with delay to consult are presented in table 5. Relative to young women with advanced maternal age were significantly more likely to delay for consult (77.8% vs 61.7%, OR: 2.177 (1.245-3.806), p=0.006). Relative to women who have attended university education, women with primary education were significantly more likely to delay for consultation (76.9% vs 59.0%, OR: 2.31 [1.06-5.034], p=0.035). A higher likelihood of delaying to consult was also observed among with no formal education even though it was not statistically significant relative to women with university education (80% vs 59%, OR: 2.783 (0.521-14.866), p=0.231). Relative to women employed in private sector, women with no occupation were three times more likely to delay for consultation (74.2% vs 48%, OR: 3.115, 95%CI: 1.182-8.209, p=0.022). In this relation, farmers and women owning a business were also more likely to have delayed consultation (72.7%, OR: 2.889, 95%CI: 1.113-7.496, p=0.029 and 71.3%, OR: 2.687, 95%CI: 1.08-6.686, p=0.034 respectively).

Table 5. Sociodemographic factors associated with delays

	Delayed to consult, N (%)		OR	p-value
	Yes	No		
Age group				
< 35 years	82 (61.7)	51 (38.3)	2.177 (1.245-3.806)	0.006
≥ 35 years	91 (77.8)	26 (22.2)		
Residence				
In Kigali	96 (71.1)	39 (28.9)	1.215 (0.709-2.081)	0.478
Out of Kigali	77 (67.0)	38 (33.0)		
Marital status				
Cohabitate	40 (74.1)	14 (25.9)	0.739 (0.375-1.456)	0.381
Married	133 (67.9)	63 (32.1)		
Current husband				
First	121 (66.1)	62 (33.9)	0.563 (0.294-1.079)	0.081
Second	52 (77.6)	15 (22.4)		
Education				
No formal education	8 (80.0)	2 (20.0)	2.783 (0.521-14.866)	0.231
Attended primary school	83 (76.9)	25 (23.1)	2.31 (1.06-5.034)	0.035
Attended secondary school	59 (63.4)	34 (36.6)	1.207 (0.562-2.594)	0.630
Attended university	23 (59.0)	16 (41.0)	-	Ref
Occupation				
No occupation	46 (74.2)	16 (25.8)	3.115 (1.182-8.209)	0.022
Farmer	48 (72.7)	18 (27.3)	2.889 (1.113-7.496)	0.029
Owns a business/company	62 (71.3)	25 (28.7)	2.687 (1.08-6.686)	0.034
Public servant	5 (50.0)	5 (50.0)	1.083 (0.25-4.698)	0.915
Employed in private sector	12 (48.0)	13 (52.0)	-	Ref
Wealth index				
Category I	9 (69.2)	4 (30.8)	1.125 (0.078-16.307)	0.931
Category II	63 (66.3)	32 (33.7)	0.984 (0.086-11.27)	0.990
Category III	99 (71.2)	40 (28.8)	1.238 (0.109-14.034)	0.863
Category IV	2 (66.7)	1 (33.3)	-	Ref

3.2.2. Obstetric factors associated with delay to consult

The results of this study show that women who had an unintended pregnancy on most recent pregnancy were significantly more likely to have a delay in consultation for infertility (85.4% vs 63.8%, OR: 3.317, 95%CI: 1.247-8.826, p=0.013). Similarly, compared with women who had a miscarriage on their most recent pregnancy, women for whom the pregnancy resulted into a live birth were three times more likely to have a delay in consultation for infertility (84.2% vs 59.4%, OR: 3.649, 95%CI: 1.53-8.704, p=0.003). Non-significant factors associated with delay to consult for infertility were: gender of the youngest child, having a live child, and the type of infertility.

Table 6. Obstetric factors associated with delay to consult

		Delay to consult, N (%)		OR	p-value
		Yes	No		
Recent pregnancy	Intended	51 (63.8)	29 (36.3)	3.317 (1.247-8.826)	0.013
	Unintended	35 (85.4)	6 (14.6)		
Recent pregnancy outcome	Miscarriage	38 (59.4)	26 (40.6)	3.649 (1.53-8.704)	0.003
	Live birth	48 (84.2)	9 (15.8)		
Gender on recent pregnancy	Female	33 (84.6)	6 (15.4)	0.505 (0.159-1.605)	0.242
	Male	25 (73.5)	9 (26.5)		
History of abortion	Yes	40 (60.6)	26 (39.4)	0.590 (0.327-1.064)	0.078
	No	133 (72.3)	51 (27.7)		
Has a live child	Yes	53 (76.8)	16 (23.2)	1.684 (0.889-3.188)	0.107
	No	120 (66.3)	61 (33.7)		
Type of infertility	Primary	87 (67.4)	42 (32.6)	1.186 (0.692-2.033)	0.534
	Secondary	86 (71.1)	35 (28.9)		

IV. DISCUSSION

The purpose of this study was to evaluate the prevalence of women consulting for infertility and factors hindering early consultations. The results show a significant proportion (20.5%) of women consulting for infertility purpose and a disproportionate prevalence of infertility cases between institutions. Two thirds of the women consulting for infertility were delayed and significant factors hindering the early consultation were women's age, level of education, occupation, recent pregnancy intention and outcomes.

The prevalence of infertility at RMH was higher compared with the worldwide prevalence of 15%(14) as well as other study done in east African countries including Rwanda and but lower at CHUK (15–18). Women with infertility are expected to consult any health institution, but, in the end, they are all referred to higher level of care where a specialized assessment and management can be offered. Therefore, the higher prevalence of infertility in our study can be explained by the tertiary level of care provided at our study sites, which makes these centers the most attended public institutions for infertility purposes. It is not surprising to record a very high prevalence of infertility patients at RMH (38.5%) due to the hospital's unique comprehensive infertility clinic in the country, being the only public hospital providing assisted reproductive technology (ART) services. The prevalence of infertility at outpatient department of obstetrics and gynecology at CHUK (5.3%) was comparable to the results from a previously conducted study done at another university teaching hospital in Rwanda in 1985 and comparable to the findings in Ethiopia and Nepal that also showed a prevalence rate in range of 3.27% to 5.45%(17,19,20).

It is natural that fertility is poorly guaranteed in the first few months after marriage but the odds of becoming pregnant increases with every month added (21). Therefore, it is reasonable to offer expectant management when young couples consult for infertility until they complete 12 months of regular sexual intercourse(22,23). However, it is not recommended to wait for too long since the cause of infertility may lack spontaneous natural correction and the chances of getting pregnant reduces with maternal age(24). The observed delay to consult among our study participants is consistent with results from Indonesia also showing the median time to consult being 25 months after marriage (25). This can potentially decrease the woman's likelihood to make a pregnancy especially when an underlying cause depends on the HPO axis or poor ovarian reserve. Our results have identified poor utilization of early consultation for infertility among women aged 35 years or more (advanced maternal age). It is important to note that, the comprehensive fertility services in Rwandan public sector is new (less than 5 years). The lack of the service and limited options to manage

infertility in the past 5 years might have discouraged women to consult public institutions, and the service package was not available until when they were already in advanced maternal age. A non negligible number of our participants have also indicated to have consulted religious attendings and traditional medicine before consulting for medical care and this might have also contributed to the delay in seeking for care. Even though traditional medicine may results into positive outcomes in management of infertility, they lack scientific evidence of the pharmacokinetic nature of the ingredients, instead, they may delay or alter the results of established medical management as highlighted by Jaradat et al, (13,26).

Our results have shown an association between lower education and delay to seek for infertility care, which is in agreement with the results from Britain showing less likelihood to seek for healthcare among women and men with infertility and lower education and occupational classifications(7). Similar to our results, the study from Britain did not find significant association with economic classification. This implies an implementation of the universal health coverage giving access to all with no limitation based on economic classification of the population, (27).

Pregnancy intention has been documented to effect health services, described as poor and delayed utilization maternal health services when the pregnancy is unintended(28). In our study, women for whom the most recent pregnancy was unintended, they poorly or lately sought for medical attention when they developed infertility. Similar findings were observed among women whose recent pregnancy had resulted into a live birth. This can be explained by the previous natural pregnancy with maternal effort and with subsequent assumption that they are fertile by default and yet they run a background risk for secondary infertility.

V. Conclusion and Recommendation

The prevalence of women consulting for infertility health care is high at outpatient departments of largest public hospitals in Kigali, counting for more than one third of the total consultations. This shows a need for involving infertility services in the global and public health with special consideration of women with advanced maternal age and lower education level, whom, our study have indicated to have a delayed utilization of healthcare services. Health education to women and couples in general is required to explain to the community about their right to use the existing healthcare services.

Limitation of the study:

The limitation of this study was challenged by the novel covid-19 containment measures including lockdowns and confinements that hindered movements of our participants to the hospitals and, hence, the participants from distant districts from Kigali might not have been sufficiently represented. Also, this study was not powered significantly enough to investigate the participants' perspective of why women had delayed and hence, a more robust mixed method design with qualitative component would evaluate all aspects of delay to consult. The strength of our study was the inclusion of the largest and only public fertility center which gave us an advantage to recruit more participants.

Competing interest.

The author declares no competing interest during this study.

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Annex

Annex 1. Questionnaire

1. Age (in years).....
2. What is your district of residence?.....
3. Level of education
 - a. Non formal education
 - b. Attended primary school
 - c. Attended secondary school
 - d. Attended university
4. Marital status
 - a. Single
 - b. Married
 - c. Cohabitate
5. Occupation (chose all that apply)
 - a. No occupation
 - b. Peasant Farmer
 - c. Farmer
 - d. Owns a business/ company
 - e. Public servant
 - f. Employed in private sector
6. Current Wealth index
 - a. Cat A
 - b. Cat B
 - c. Cat C
 - d. Cat D
 - e. Cat E
7. Estimated monthly income in Rwandan Francs:.....
8. Current Obstetric Formula: G.....T.....P.....A.....L
9. Outcome of the most recent pregnancy (choose all that apply)
 - a. Abortion
 - b. Preterm delivery
 - c. Fetal demise
 - d. Term delivery
 - e. N.A
10. If yes, When was your most recent pregnancy?yearsmonths ago
11. Pregnancy intention on the most recent pregnancy:
 - a. Intended
 - b. Unintended
 - c. N.A
12. What is the gender of your youngest child?
 - a. Female
 - b. Male
 - c. N.A
13. According to you, do you currently have a reliable sexual partner?
 - a. Yes
 - b. No
14. Is this your first husband?
 - a. Yes
 - b. No
15. If no, do you have any child with the current husband?
 - a. Yes
 - b. No
16. For how long have you been living with the current husband?
 - a. Answer:years +months
17. For how long had you been living with a husband/ partner (from the first husband)?
 - a. Answer:years +months

18. How did you learn that you have infertility? (*choose all that apply*)
 - a. After failing to conceive, I thought I maybe having infertility
 - b. I explained to a healthcare provider and he/she told me I have infertility
 - c. My partner told me that I may be having infertility
 - d. My relative / friends who know my story, they told me I have infertility
 - e. I didn't know I had infertility until today when they told me
19. Have you thought your infertility may due to witchcraft?
 - a. Yes
 - b. No
20. Have you ever thought you might be having infertility as a couple?
 - a. Yes
 - b. No
21. If yes, who did you think was the infertile?
 - a. Me (the woman)
 - b. My husband / Partner
 - c. Both of us
22. Of the following, where have you consulted for infertility purpose? (*choose all that apply*)
 - a. Never consulted for infertility purpose before
 - b. I have consulted my friend
 - c. My parents
 - d. Religious attending
 - e. Traditional medicine
 - f. Health centre
 - g. District Hospital
 - h. Tertiary hospital
 - i. Private clinic
 - j. I have consulted abroad for infertility
23. When did you first consult for infertility/ How long ago?years andmonths
24. When you first consulted at hospital/clinic, did you have hope that they would help manage your condition?
 - a. Yes, I had hope that they will treat my condition
 - b. No, I consulted just to try a chance
 - c. No, I consulted only because my husband insisted
 - d. No, I consulted because my colleagues advised me to
25. When you first consulted, what was your expectations?
 - a. That I would be given medicines and go back home expecting to get pregnant
 - b. That they would make investigations and tell me what else to do
26. What do you think is the reason why women delay to consult for infertility?
 - a. They don't believe it is helpful
 - b. Lack of money
 - c. Lack of husband's support
 - d. Going to traditional medicine
 - e. Attending for religious hope
 - f. Lack of time
 - g. Lack of diagnosis
 - h. Lack of information that it can be treated
 - i. Lack of trust in health facilities

Annex 2. Ethical approval



UNIVERSITY of
RWANDA

COLLEGE OF MEDICINE AND HEALTH SCIENCES

DIRECTORATE OF RESEARCH & INNOVATION

CMHS INSTITUTIONAL REVIEW BOARD (IRB)

Kigali, 1st /March /2021

Dr Francois Sebashi

School of Medicine and Pharmacy, CMHS, UR

Approval Notice: No 064/CMHS IRB/2021

Your Project Title "*Causes of Delay to Consult for Infertility among Rwandan Women Attending the University Teaching Hospital of Kigali*" 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		
Dr Stefan Jansen	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 22nd January 2021, **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 1st March 2021

Expiration date: The 1st March 2022

Dr Stefan Jansen
Ag. 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

Email: researchcenter@ur.ac.rw

P.O Box 3286 Kigali, Rwanda

www.ur.ac.rw



REF: *h.d.* /RMH/COMDT/2021

August 02, 2021

Dr SEBASHI François
Kigali City
Nyarugenge District
Nyarugenge Sector
Tel: +250 787334934

RE: APPROVAL NOTICE

1. In reference to your letter received on 26 July 2021, requesting permission to collect data at Rwanda Military Hospital, I am pleased to confirm that your research project entitled **“Causes of Delayed Consultation for Infertility among Women Attending Public Referral Hospitals of Kigali. Case of Rwanda Military Hospital and University Teaching Hospital of Kigali”** have been approved by the Rwanda Military Hospital Institutional Review Board (RMH/IRB).
2. Please note that approval of this protocol is valid for **12 months**.
3. Attached is the review notice from RMH/IRB for your reference.

Sincerely,

Dr E RURANGWA
Brig Gen
Commandant

CC:

- Chairperson Institutional Review Board, RMH
- Clinical Services Division Manager, RMH



August 02, 2021

Ref.: RMH IRB/043/2021

REVIEW NOTICE

Dear François SEBASHI
UNIVERSITY OF RWANDA

Your research project: “Causes of Delayed Consultation for Infertility among Women Attending Public Referral Hospitals of Kigali. Case of Rwanda Military Hospital and University Teaching Hospital of Kigali” has been evaluated by the Rwanda Military Hospital Institutional Review Board (RMH IRB).

Name	Institute	Involved in the decision		
		Yes	Absent	Withdrawn from the proceeding
Lt Col Dr Eric SERUYANGE	RMH	X		
Maj Dr Florent RUTAGARAMA	RMH	X		
WO II KAYITARE Pacifique	RMH		X	
Maj (Rtd) Jean Damascène GASHHEREBUKA	RAHPC		X	
Dr Leila MUKARUZIMA	RMH	X		
Dr Fidèle BYIRINGIRO	RMH	X		
Janvière MUTAMULIZA	RMH	X		
Boniface NSENGIYUMVA	RMH		X	
Jean NSABIMANA	RMH		X	
Jazira Munyana	RMH	X		

After review of the protocol and other related documents during the IRB meeting of July 28, 2021 where quorum was met, we hereby provide approval for the above-mentioned protocol.

Please note that the approval of the protocol lasts for a period of **12 months** from the date of this notice.

You are responsible for fulfilling the following requirements:

1. Changes, amendments, and addenda to the protocol must be submitted to the RMH/IRB for review and approval, prior to activation of the changes.
2. A continuing review application must be submitted to the RMH/IRB in a timely fashion and before expiry of this approval.
3. Failure to submit a continuing review application will result in termination of the study.
4. Notify the Rwanda Military Hospital IRB once the study is finished and submit the final report.
5. Present the results of your study to the RMH/IRB before publication.

Sincerely,

Date of Approval : August 02, 2021

Expiration Date : August 01, 2022



Dr. Eric SERUYANGE
Lt Col
Chairperson, RMH/IRB

Review Approval Notice

Dear SEBASHI Francois,

Your research project: “Causes of delay to consult for infertility among Rwandan women attending the University Teaching Hospital of Kigali ”

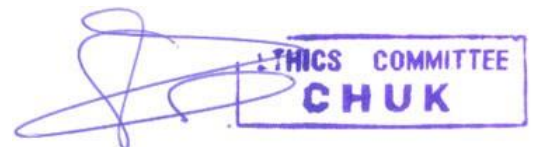
During the meeting of the Ethics Committee of University Teaching Hospital of Kigali (CHUK) that was held on 18th May,2021 to evaluate your request for ethical approval of the above mentioned research project, we are pleased to inform you that the Ethics Committee/CHUK has approved your research project.

You are required to present the results of your study to CHUK Ethics Committee before publication by using this link:www.chuk.rw/research/fullreport/?appid=348&&chuk.

PS: Please note that the present approval is valid for 12 months.

Yours sincerely,

Dr Emmanuel Rusingiza Kamanzi
The Chairperson, Ethics Committee,
University Teaching Hospital of Kigali



Scan code to verify.

“ University teaching hospital of Kigali Ethics committee operates according to standard operating procedures (Sops) which are updated on an annual basis and in compliance with GCP and Ethics guidelines and regulations “

Annex 3: Consent form

You are invited to take part in a research study on Causes of delayed consultation for infertility among

Rwandan women attending two main Public Hospitals in Rwanda

. The researcher is inviting **infertile women** to be in the study. This form is part of a process called “informed

consent” to allow you to understand this study before deciding whether to take part.

This study is being conducted by a researcher named Francois SEBASHI, who is a postgraduate trainee in obstetrics and gynecology at the University of Rwanda, College of medicine and health sciences.

The purpose of this study is to identify Causes of delayed consultation for infertility among Rwandan women attending three main Public Hospitals in Rwanda .

If you agree to be in this study, you will be asked to:

- Sign this informed consent form
- To respond to the questions in the data collection form. This will take an average of 10minutes

Voluntary Nature of the Study:

This study is voluntary. Everyone will respect your decision of whether or not you choose to be in the study. No one will treat you differently if you decide not to be in the study. If you decide to join the study now, you can still change your mind later. You may stop at any time.

Risks and Benefits of Being in the Study:

Being in this study would not pose risk to your safety or wellbeing. There are no individual benefits or payment for participating into this study

Privacy:

Any information you provide will be kept anonymous. The researcher will not use your personal information for any purposes outside of this research project. Also, the researcher will not include your name or anything else that could identify you in the study reports. Data will be kept secure for a period of at least 5 years, as required by the University of Rwanda.

Contacts and Questions:

You may ask any questions you have now. Or if you have questions later, you may contact the researcher via phone: +250 787334934, email: sebashifrancois@gmail.com. If you want to talk privately about your rights as a participant, you contact the

chairperson of ethic committee at Kigali university Teaching Hospital: Dr RUSINGIZA
Emmanuel 0785466254

- The researcher will give you a copy of this form to keep. (for face-to-face research)

Statement of Consent:

I have read the above information and I feel I understand the study well enough to make a decision about my involvement. By signing below, clicking the link below, returning a completed survey, I understand that I am agreeing to the terms described above.

Dare:/...../2021

Participant's Signature

Researcher's Signature

AMASEZERANO YO KUGIRA URUHARE MU BUSHAKASHATSI

Uratumiwe muri ubu bushakashatsi “impamvu zituma abagore batinda kwisuzumisha ubugumba,

mubitaro bibiri bikuru mu Rwanda”

Umushakashatsi, atumiye umugore wese ufite ikibazo cy’ ubugumba kuba muri ubu bushakashatsi.

Aya ni amasezerano yo kugira uruhare mubushakashatsi, mbere yo kumva neza ubwo aribwo.

Ubu bushakashatsi buyobowe na SEBASHI Francois, uri gukurikirana amasomo mubijyanye no kuvura ababyeyi(obstetrician & gynecologist) muri kaminuza nkuru y’ u Rwanda ishami ry ubuganga.

Intego y’ ubu bushakashatsi ni ukureba “impamvu zituma abagore batinda kwisuzumisha ubugumba,

mubitaro bibiri bikuru mu Rwanda”

Iyo wemeye kujya mubushakashatsi

1. Usinya amasezerano yo kujya mubushakashatsi
2. Usubiza ibibazo biba byabajijwe numushakashatsi

Ibi bishobora gutwara iminota icumi ugereranyije.

Kujya mubushakashatsi kubushake

Kujya mubushakashatsi ni ubushake. Twubahiriza uburenganzira bw umuntu, kujyamo cg kutajyamo. Ntatumwe uzabikurenganyiriza. Uhisemo kujyamo ushobora kubihindura nyuma ukabuvamo igihe ushakiye.

inyungu n’ ingaruka zijyanye no kuba mubushakashatsi

kuba muri ubu bushakashatsi nta ngaruka zirimo, nta n’ inyungu z’ umuntu kugiti cye uzajya muri ubu

bushakashatsi.

ibanga

Amakuru azatangwa abikwa nk ibanga, umushakashatsi ntabindi azayakoresha bitari ubu bushakashatsi Nta mazina azashyirwa ahagaragara y' abagiye mubushakashatsi, amakuru azabikwa imyaka 5 nkuko biteganywa na kaminuza y' u Rwanda.

aho wabariza ugize ikibazo

Ushobora kubaza ikibazo icyo aricyo cyose ubu. Igihe ugize ikibazo nyuma ushobora kubaza umushakashatsi kuri telephone n'ujyenda +250787334934, email: sebashifrancois@gmail.com. Ushaka kubaza kubijyanye

nuburenganzira bwawe nkukorerwaho ubushakashatsi wabaza uhagarariye agashami k' ubushakashatsi

mubitaro bikuru bya kaminuza ya Kigali: Dr RUSINGIZA Emmanuel, 0785466254. Umushakashatsi azaguha aya masezerano.

indahiro y' usinya amasezerano

Jyewe Nasomye kandi numvise bihagije ibijyanye n' ubu

bushakashatsi, mfashe icyemezo cyo kuba muri ubu bushakashatsi

Izina ry ukoreweho ubushakashatsi

Izina ry'umushakashatsi.
