

# Knowledge, Attitude, and Practice of Exclusive Breastfeeding Among Mothers Attending Masaka District Hospital Kigali/Rwanda: a Cross-section Study.

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## Research

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# Abstract

**Background:** Exclusive breastfeeding (EBF) for 6 months is considered a major public health intervention to reduce the escalating child mortality of neonates and infants in low and middle-income countries. In most East Africa countries, exclusive breastfeeding did not meet the recommendation of WHO/UNICEF that a baby should be fed only breast milk for the first 6 months. This study is aimed to provide knowledge, attitudes, and practice (KAP) towards EBF and identify factors associated with the practice of exclusive breastfeeding.

**Methods:** A cross-sectional study was conducted from January to April 2020. A total of 364 mothers were interviewed using a questionnaire. Univariate statistical analysis was used to define variables using frequencies and percentages. Multiple logistic regression was also applied to identify the factors associated with EBF practice.

**Results:** In the current study, the majority of mothers, 84%, presented good knowledge, 87.0% also showed a good attitude toward EBF. Nearly 95.9% of the respondents understood the benefits of EBF practice for at least six months, 86.0% also responded that breast milk should be started immediately after birth within an hour. Besides, 87.6% knew the importance of the first breast milk or colostrum. 92.3% of mothers understand that breastfeeding increases mother-infant bonding, 92.3% of mothers understand that breastfed babies are healthier than formula-fed babies, and 94.8% believed that breast milk is the ideal food for babies. Furthermore, 76.4% of the surveyed mothers exclusively breastfed their infants for the first 6 months after delivery. A married women (OR=.270; 95%CI=.160-.457,  $p<.001$ ), had a high school degree (OR= .150; 95CI=.073-.307;  $p<.001$ ), mothers whose had babies more than three (OR=.090; 95%CI=.035-.233,  $p<.001$ ), good knowledge score (OR=2.535; 95%CI=1.399-4.594,  $P=0.002$ ) and positive attitude score OR=2.051; 95%CI=1.149-3.662,  $P=0.015$ ) were statistically significant association with EBF.

**Conclusion:** In the studied area; knowledge and attitude of mothers towards EBF are relatively high. However, the level of EBF is still below the WHO recommendation. The findings of this study highly inform policymakers and healthcare providers to direct their efforts to provide evidence-based information and recommendations on the benefits of breastfeeding to promote the practice of exclusive breastfeeding.

## Background

The World Health Organization (WHO) and the United Nation Children's Fund (UNICEF) recommend EBF for infants and should not be given any other food or drink except breast milk, medications, vitamin or mineral drops, oral rehydration solution in the first 6 months of life and its continuity along with supplementary foods for up to 2 years of age or over [1–5]. Breastfed children are at least six times more likely to survive in the early months than non-breastfed children according to UNICEF, the potential impact of EBF is especially important in developing countries with a high burden of disease and limited access

to clean water and adequate sanitation, promoting EBF is the most successful child health intervention currently feasible for low-income populations[4, 6].

Mother and children are considered to be prone to illness, and there are some underlying risk factors for neonatal mortality and morbidity for instance insufficient breastfeeding, following defective breastfeeding methods, mother's unawareness of feeding practices, culture and beliefs, lack of health education, and practices are prevalent in the postpartum period. Besides, delaying the introduction of a baby to the breast immediately after birth is also a great concern because the colostrum is very useful for the immunity and growth of the baby. Therefore, all these poor practices lead to the suppression of lactation by inactivating prolactin hence reducing the quantity of breast milk[7].

According to the current papers in the sub-Saharan Africa region, only 53.5% of children in East African countries were practiced on EBF for six months, and the global rate of EBF is 37%[8, 9]. Rwandan mothers practicing EBF are currently at 81% according to the most recent published demographic and health survey(DHS) in Rwanda (2019-20) which is still below the WHO target of 90% and Rwanda nutrition profile, the infant mortality rate is 32 per 1,000 live births, and the under-five mortality rate is 50 per 1,000 live births. One of the contributing factors to infant mortality is sub-optimal breastfeeding. Moreover, lack of awareness and the benefits of EBF coupled with the hazards, and risks associated with bottle feeding needs also emerging interventions [10, 11].

According to Rwanda DHS 2019-20, the prevalence of stunting among children under 5 years (0–59 months) is 33%, and 16.2% of children were stunted at six months of age, and this indicates that stunting is attributed to inadequate nutrition of the mother or serious illness during and after pregnancy [10]. The national KAP study found that about 32% of mothers don't know the time to introduce complementary foods, this is because many of these infants were stunted during the gestation period. Intrauterine growth from poor nutrition during pregnancy [12]. Moreover, the previous study conducted at the University Teaching Hospital of Kigali (CHUK) reported that 96.1% did not receive any type of education about breastfeeding during their antenatal care visits and only 5% knew the risks of providing breast milk substitutes to their infants and this knowledge was independent of education during their antenatal care (ANC) attendance[13].

The head of the Rwanda Health Communications Center, says the breastfeeding campaign is to help to make sure this number does not slip any further. Along with six weeks of paid maternity leave, Rwandan mothers are legally allowed to take an hour per day for breastfeeding their children for up to one year[10]. Rwanda's ministry of health target is to increase the rate of EBF infants aged 0–6 months to at least 90% in July 2018 to June 2024, has mainstreamed promotion of EBF as one of the priority's nutrition interventions in the country[14].

The key to successful breastfeeding is education, information, and communication strategies aimed at behavior change, for such a promotional campaign to be effective, the attitudes and practices of health workers must be improved[15]. The international baby-friendly Hospital Initiative (BFHI), which was propelled in 1991 by UNICEF and WHO supports and guards maternal and child health. This is achieved

by ensuring that women are supported and assisted with breastfeeding in maternity care facilities. It has been proved that BFHI affects the early initiation and EBF breastfeeding rates directly at the hospital level[16]. EBF will be much easier and attractive to mothers if timely health education, support, and counseling are applied [17]. To strengthen breastfeeding practices, raising awareness, and the social support network available to mothers must be reinforced. It is admittedly that EBF reduces infant mortality, fosters development, and immunity [18].

This study was the first to evaluate the knowledge, attitude, and practice of EBF among women in the health facility of Rwanda. However, has specifically examined the knowledge and attitude towards EBF among mothers in the study area. So, there is a need to investigate the knowledge, the attitude of Rwandan mothers towards EBF practices, so that, newborn babies' health problems can be avoided. This study is aimed to provide information about mothers' knowledge, attitudes, and practice towards EBF and identify factors associated with the practice towards exclusive breastfeeding.

## **Materials And Methods**

### **2.1. Study design and period**

This study was based on a descriptive cross-sectional study, conducted between January to April 2020.

### **2.2 Study setting**

This study was conducted in MDH; it is a public hospital with a secondary level of care located in the Masaka neighborhood, in the capital city of Kigali, MDH is one public district hospital in Kicukiro district, it is a fresh brand hospital built. They offer specialized medical services and general medical services. The inhabitants who get served there fall between 380,000 and 400,000.

### **2.3. Study participants**

Participants were selected based on a convenience non-random collection. A convenience non-random collection sampling technique approach was used where all mothers who were seen in the hospital during the period of data collection were enrolled if inclusion criteria were met.

#### **Inclusion criteria:**

- All mothers attending the following departments, neonatology, maternity wards, immunization, obstetrics, and gynecology outpatient clinic for pregnant, women coming for antenatal visits in the hospital were all considered during data collection after being given the consent of the study. Those who had at least one child aged 6 months or younger at the time of the study were included.

#### **Exclusion criteria:**

- Mothers attending the health facility who were not willing to participate in the study.

- Mothers who are mentally ill.

## 2.4. Sample Size and Sampling Technique

We have used a single population proportion formula by taking a proportion of prevalence of EBF of the previous study, 68.6% [13] and we used a 95% confidence interval. To adjust the non-response rate of study participants, we were added 10% of the sample size. Sample size determination using the Fischers formula:

$$n = \frac{Z_{\alpha/2}^2 P(1-P)}{d^2}$$

$$n = \frac{1.96^2 * 0.686(1-0.686)}{0.05^2} = 330.99$$

Henced the total sample size required for this study with a 10% continuity correction was 364.

where  $a$  is the level of significance which can be obtained as  $1 - \text{confidence interval}$ ,  $P$  is a proportion of prevalence EBF, which is equal to 68.6,  $D$  is the maximum acceptable difference (margin of error) which is equal to 5%, and  $Z_{a/2}$  is the value under the standard normal table for the given value of confidence level which is equal to 1.96.

## 2.5. Data collection procedure and techniques

Data were collected during the study period via face-to-face interviews with women on a randomly selected working weekday. The researchers approached the mothers who visited MDH and those who accepted to participate in the study were interviewed until the final sample number was reached. The interviews were performed in the waiting rooms of the hospital using a questionnaire. Also, the interviews lasted 10 minutes on average and privacy were maintained during the interviewing period. This was done to maximize the chances of the participants feeling comfortable and able to answer the questionnaire. Before starting the interview, the researchers described the survey topic and the organization of the questionnaire to the participants and assured them that the interview was completely anonymous, and that the data collected would be saved private, and that the written informed consent was collected. Besides, the research team explained to the women that they could stop the interview at any time without penalty, the participation was voluntary, and that no payment would be given.

## 2.6. Instrument

The questionnaire was organized into five sections: Section A: sociodemographic data, Section B: data on exclusive breastfeeding knowledge, Section C: Data on the attitude of respondents towards EBF, Section D: data on the practice of respondents towards EBF, and Section E: Reasons of not exclusive breastfeeding and information on breastfeeding practices.

Structured and semi-structured questionnaires were used for the data collection in the form of a closed-ended (multiple choice) question style. The items included in the questionnaire were chosen based on previously published investigations of a validated standardized questionnaire, the questionnaire used in the present [17, 19-22], or because they were considered interesting, or modified to meet our objectives of the study by the research team. The questionnaire will include a set of questions organized under five main sections was aimed at gathering information from mothers about exclusive breastfeeding. Section A of the questionnaire included a set of variables that targeted information about mothers social and demographic characteristics namely age, nationality, religion, marital status, educational status, partner's level of education, occupation, residence, parity, gravidity, antenatal care follow-up, type of birth, gestational age, child's body weight at birth, place of birth, and rooming-in.

Besides, there were 20 items to measure the knowledge of the participants about exclusive breastfeeding. Three possible responses for each item (Yes, No, and I don't know). Correct responses were scored as one, and zero for other options. By summing up all the awarded points, the overall score was determined for each respondent and these were translated to percentages. Each respondent will be given an information grade based on his total percentage score. All mothers who score >70% in the knowledge test were considered to have good knowledge and those scoring <70% were considered as having poor knowledge according to FAO guidelines. [23].

Maternal attitudes towards EBF were determined by responses to 12 questions. Correct responses were scored as one, and zero for other options. The total score for each respondent was calculated by summing up all the awarded marks, and these were converted to percentages. The attitude score was calculated. Attitudes were measured with questions that required "Agree", "Neutral" or "Disagree" responses. The total score for each respondent was calculated by summing up all the awarded marks, and these were converted to percentages. All mothers who scored >70% in the attitude test will be considered to have a positive attitude and those scoring <70% will be considered to a negative attitude[23].

Informed consent forms were attached to all questionnaire for the participants to read and sign if they were willing to participate in the study. Questionnaires and informed consent forms were drafted in Kinyarwanda. A pilot study was conducted after ethical approval was allowed to assess the questionnaire's comprehensibility, and modifications were accordingly made. The pilot sample met this study's inclusion, and exclusion criteria, and the pilot sample size was 36.

## **2.8. Data quality control**

Three enumerators (data collectors) with a minimum of a Diploma in Health or Nutrition qualification were recruited from those residing in the study area, and who speak Kinyarwanda (the local language) fluently. The enumerators also had previous experience in survey data collection. The enumerators underwent 2 days of training to cover the following: the explanation of the study objectives, interview techniques, and research ethics.

## 2.9. Data analysis and presentation

The data was checked, cleaned, and coded, and analyzed using SPSS version 16.0. All data were analyzed using descriptive statistics of the frequencies and percentages for categorical variables. Cross tabulation and chi-square tests were used to determine univariate associations. To determine factors associated with the practice of EBF, multiple logistic regression was executed. The dependent variable of the logistic model was EBF practice. Only variables that were significantly associated with the practice of EBF in the cross-tabulation analysis were included in the logistic regression model. The findings are presented as odds ratios and their respective confidence intervals at 95 %. The p-value < 0.05 was considered statistically significant in all analyses.

## Results

### Socio-demographic characteristics of the study participants

Table 1. Shows the Socio-demographic characteristics of mothers. This study surveyed 364 mothers who attended Masaka district Hospital between January to April 2020, most of them were in the range of 26 to 35 years of age (51.1%), most of them were married (76.1%), had a primary level of education(47.5%), were unemployed/housewife(67.6%), was delivered at a public hospital or health centers(98.4%), were delivery in full-term 37-42week (91.5%), were room in(84.9%), and were visited at least three times in antenatal care follow up(34.3%).

Table 1  
Socio-demographic characteristics of the study participants.

<b>Variable</b>	<b>Frequency</b>	<b>Percent</b>
<b>Age years</b>		
15 to 25 years	12	3.3
26 to 40 years	186	51.1
41 to 49 years	166	45.6
<b>Religion</b>		
Adventist	45	12.4
Muslim	32	8.8
catholic	121	33.2
protestant	56	15.4
others	110	30.2
<b>Marital status</b>		
Married	277	76.1
Single	87	23.9
<b>Educational status</b>		
Primary	173	47.5
High school	106	29.1
College degree or higher	85	23.4
<b>Partners level of education</b>		
Primary	202	55.5
High school	106	29.1
Tertiary education revel	56	15.4
<b>Occupational status</b>		
Employed	118	32.4
unemployed/housewife	246	67.6
<b>Residency</b>		
Urban	233	64.0
Rural	131	36.0

Variable	Frequency	Percent
<b>Parity</b>		
P1	167	45.9
P2	133	36.5
P ≥ 3	64	17.6
<b>Gravidity</b>		
G1	86	23.6
G2	132	36.3
G ≥ 3	146	40.1
<b>Place of birth</b>		
A public hospital or health centers	358	98.4
Home	6	1.6
<b>Type of birth</b>		
Vaginal delivery	251	69.0
Cesarean section	113	31.0
<b>Gestational age</b>		
Premature(< 37weeks)	31	8.5
Full term (37-42week)	333	91.5
<b>Child's body weight at birth</b>		
< 2.5kgs	29	8.0
> 2.5kgs	335	92.0
<b>Rooming-in</b>		
Yes	309	84.9
No	55	15.1
<b>Antenatal care follow up</b>		
Only one time	77	21.2
Twice	59	16.2
Three times	125	34.3
Four times	103	28.3

## Knowledge regarding exclusive breastfeeding (N=364)

The results concerning the knowledge of the study participants are described in Table 2. The findings indicate that majority 349 of study participants heard about EBF (95.9%), regarding the duration of EBF (95.9%) of them knew that EBF should be practiced for at least six months, concerning initiation, (86.0%) replied that breast milk should be started immediately after birth within an hour, about (87.6%) understand the importance of the first breast milk or colostrum, (41.5%) know the right time to start complementary feeding, about (91.5%) know breast milk alone is enough for an infant during in the first 6 months of life, while (72.5%) of mothers responded that EBF can be used to prevent early pregnancies. However, A child who is breastfed is less likely to get sick compared with formula-fed babies, (86.8%) of mothers knew that EBF for six months protects their child from diarrhea. Nearly all (96.4%) of the participants understand that breast milk is a natural food for babies that contain all nutrients, (82.1%) know breastfeeding reduces the risk of malnutrition and obesity in children, about 78.0% admits that breast milk may protect the baby against infection and chronic diseases, (96.2%) know breast milk is safe and hygienic and always available in need.

Table 2  
Knowledge regarding exclusive breastfeeding (N = 364)

Variable	Frequency	Percent
<b>Have you heard about the exclusive breastfeeding</b>		
Yes	349	95.9
No	15	4.1
<b>The knowledge that EBF should be practiced for at 6 months</b>		
Yes	349	95.9
No	15	4.1
<b>The right time to give breast milk after birth</b>		
Within an hour	313	86.0
After one hour	37	10.2
After 24 hours	14	3.8
<b>Knowledge of the importance of the first breast milk or colostrum</b>		
Yes	319	87.6
No	45	12.4
<b>The right time to start complementary foods</b>		
3 months or less	9	2.5
4 months	10	2.7
5 months	19	5.2
6 months	59	16.2
7 months or above	267	73.4
<b>Breastfeeding reduces the risk of malnutrition and obesity in children</b>		
Yes	299	82.1
No	65	17.9
<b>BM alone is enough for an infant during the first 6months</b>		
Yes	333	91.5
No	32	8.5
<b>EBF for the first 6 months used to prevent pregnancy</b>		
Yes	264	72.5

Variable	Frequency	Percent
No	100	27.5
<b>BM may protect the baby against infection and chronic diseases</b>		
Yes	284	78.0
No	80	22.0
<b>A child who is breastfed is less likely to get sick compared with formula-fed</b>		
Yes	339	93.1
No	25	6.9
<b>EBF protects against baby diarrhea</b>		
Yes	316	86.8
No	58	13.2
<b>A baby should be breastfed on demand</b>		
Yes	327	89.8
No	35	10.1
<b>BM is a natural food for babies that contain all nutrients</b>		
Yes	351	96.4
No	13	3.6
<b>BM is safe hygienic and always available</b>		
Yes	350	96.2
No	14	3.8
<b>EBF infants grow healthy and strong</b>		
Yes	353	97.0
No	11	3.0
<b>Knowledge about the dangers of bottle breastfeeding for the baby</b>		
Yes	282	77.5
No	82	22.5
<b>Knowledge about cleaning the breasts before breastfeeding</b>		
Yes	346	95.1
No	18	4.9

Variable	Frequency	Percent
<b>Breastfeeding mothers should eat a healthy diet</b>		
Yes	355	97.5
No	9	2.5
<b>Frequent sucking help for milk production</b>		
Yes	304	83.5
No	60	16.5
<b>Knowledge to give a newborn herbal medicine is dangerous</b>		
Yes	265	72.8
No	99	27.2
<b>Knowledge category</b>		
Good knowledge	306	84.1
Poor knowledge	58	15.9

Nearly (97.0%) know exclusively breastfed infants grow healthy and strong. More than three-quarters (77.5%) of the respondents knew the effects of bottle breastfeeding for the baby, A large number (95.1%) of respondents were aware of cleaning the breasts before breastfeeding and (97.5%) of breastfeeding mothers should eat a healthy diet to produce enough breastmilk to baby, and also understand that Frequent sucking help for milk production (83.5%), More than two-thirds (72.8%) of the respondents know that to give a newborn herbal medicine is dangerous. Nonetheless, from the total study participants, based on knowledge score, (84%) of the respondents were grouped as having good knowledge, and (16%) of the study participants were categorized as having poor knowledge.

### **Attitudes towards exclusive breastfeeding (N=364)**

The EBF of the mother's table concerning the attitude is presented in Table 3. The majority of mothers 94.5% agree that introducing colostrum within an hour after delivery is important for the baby, most of the mothers 93.4% agree that breast milk for a newborn within an hour after birth is important and 93.7% of mothers understand that breastfeeding is better than artificial feeding. However, 81.0% of participants reported that is difficult for breastfeeders to take care of their family, and 92.3% of mothers agree that breastfeeding increases mother-infant bonding. Furthermore, 92.3% of mothers agreed to prefer breastfed babies are healthier than formula-fed babies, and 89.6% agree that women should breastfeed in public places. Almost all respondents 94.8% believe that breast milk is the ideal food for babies, about half the mothers 50.5% agree that starting complementary feeding to a child before 6 months is important, while 87.9% prefer to feed your baby breast milk alone for the first 6 months. 66.2% of mothers agree

breastfeeding will make mother's breasts sag, and only 45.3% of participants agree that breastfeeding affects their beauty. However, from the total study participants, based on attitude score, 87% of the respondents were grouped as having positive and 13% of the study participants were categorized as having a negative attitude.

Table 3  
Attitudes towards exclusive breastfeeding (N = 364)

<b>Variables</b>	<b>Frequency</b>	<b>Percent</b>
<b>Breastfeeding immediately the first milk or colostrum is important</b>		
Agree	344	94.5
Neutral	14	3.8
Disagree	6	1.6
<b>BM for a newborn immediately within an hour after birth is important</b>		
Agree	340	93.4
Neutral	19	5.2
Disagree	5	1.4
<b>Breastfeeding is better than artificial feeding</b>		
Agree	341	93.7
Neutral	16	4.4
Disagree	7	1.9
<b>Is difficult for breastfeeders to take care of their family</b>		
Agree	295	81.0
Neutral	25	6.9
Disagree	44	12.1
<b>Breastfeeding increases mother-infant bonding</b>		
Agree	336	92.3
Neutral	15	4.1
Disagree	13	3.6
<b>Prefer breastfed babies are healthier than formula-fed babies</b>		
Agree	336	92.3
Neutral	16	4.4
Disagree	12	3.3
<b>Women should breastfeed in public places</b>		
Agree	326	89.6
Neutral	21	5.8

<b>Variables</b>	<b>Frequency</b>	<b>Percent</b>
Disagree	17	4.7
<b>BM is the ideal food for babies</b>		
Agree	345	94.8
Neutral	12	3.3
Disagree	7	1.9
<b>Starting complementary foods to a child before 6 months is important</b>		
Agree	184	50.5
Neutral	29	8.0
Disagree	151	41.5
<b>Prefer to feed your baby breast milk alone for the first 6 months</b>		
Agree	320	87.9
Neutral	22	6.0
Disagree	22	6.0
<b>Breastfeeding will make the mother's breasts sag</b>		
Agree	241	66.2
Neutral	27	7.4
Disagree	96	26.4
<b>Breastfeeding affects your beauty</b>		
Agree	165	45.3
Neutral	57	15.7
Disagree	142	39.0
<b>Attitude category</b>		
good attitude	299	82.1
poor attitude	65	17.9

### **Exclusive breastfeeding practices of study participants (N=364)**

Table 4 shows the respondent's practice of EBF. 76.4% of the surveyed mothers exclusively breastfed their infants for the first 6 months after delivery and 23.6 % of the mothers did not EBF their babies. Besides

38.4% indicated that breast milk was insufficient to grow children, 17.4% HIV and unintended pregnancies, 11.6% baby gets hungry and Child being thirsty, 10.4% livelihood and living conditions, 7.0% Cultural belief and the need to introduce herbal medicine for culture, 4.7% work schedule and, 3.2% poverty.

Table 4  
Exclusive breastfeeding practices of study participants (N = 364)

Variables	Frequency	Percent
<b>Breastfeed your baby exclusively</b>		
Yes	278	76.4
No	86	23.6
<b>Reasons for not breastfeeding exclusively(N = 86)</b>		
Livelihood and living conditions	9	10.4
The Baby gets hungry and the child being thirsty	10	11.6
HIV and unintended pregnancies	15	17.4
Breast milk was insufficient	33	38.4
work schedule	4	4.7
Early and single motherhood	7	8.1
Poverty	2	2.3
Cultural belief and the need to introduce herbal medicine for cultural	6	7.0

### Cross-tabulation of characteristics of mothers who do and do not practice EBF (364)

The characteristics of mothers who either do or do not practice EBF are presented in Table 5. The majority of the surveyed mothers were between the ages of 26 to 49 years. There was no association found between age and the practice of EBF  $\chi^2(2) = .760, p > .05$ . The characteristics of mothers who do and do not practice EBF are presented in Table 5. EBF was found to be statistically associated with marital status  $\chi^2(1) = 43.022, p < .001$ . The educational level of both mothers and their partners was statistically significant to be associated with the practice of EBF  $\chi^2(2) = 28.009, p < .001$ ,  $\chi^2(2) = 10.461, p = .005$  respectively. It was observed that mothers practiced EBF according to their level of education. Unemployment for mothers stood at 246(67.6%) while 118(32.4%) were employed. The occupation of the mothers was not found to have an association with EBF  $\chi^2(1) = .312, p > .05$ . The association with parity, antenatal care, and practice of EBF was statistically significant. However, gravidity and religion were not statistically significant. There was a statistically significant association with good knowledge score,

positive attitude, and EBF practice  $\chi^2(2) = 7.349, P = .007$ ,  $\chi^2(2) = 37.400, P < .001$  respectively as illustrated in table 5.

Table 5

Cross-tabulation of characteristics of mothers who do and do not practice EBF (364)

variables	Exclusive Breastfeeding		$\chi^2$	P-value
	Yes(278)%	No(86)%		
<b>Ages</b>				
10 to 25 years	8(2.87)	4(4.65)	.760	.444
26 to 40 years	144(51.79)	42(48.83)		
41 to 49 years	126(45.32)	40(46.51)		
<b>Marital status</b>				
Married	229(82.37)	48(55.81)	43.022	.000*
Single	49(17.62)	38(44.18)		
<b>Education status</b>				
Primary	102(36.69)	71(82.55)	28.009	.000*
High school	96(34.53)	10(11.62)		
College	80(28.77)	5(5.8)		
<b>Partner level of education</b>				
Primary	153(55.03)	49(56.97)	10.461	.249
High school	86(30.93)	20(23.25)		
College	39(14.02)	17(19.76)		
<b>Occupational status</b>				
Employed	88(31.65)	190(68.34)	.312	.576
Unemployed	30(34.88)	56(65.11)		
<b>Residency</b>				
Urban	179(64.38)	54(62.79)	.073	.441
Rural	99(35.61)	32(37.20)		
<b>Parity</b>				
P1	88(31.65)	79(91.86)	10.439	.000*
P2	130(46.76)	3(3.48)		
P $\geq$ 3	60(21.58)	4(4.65)		
<b>Gravidity</b>				

G1	64(23.02)	22(25.58)	2,788	.248
G2	95(34.17)	37(43.02)		
G≥3	119(42.80)	27(31.39)		
<b>Place of birth</b>				
A public hospital or health centers	272(97.84)	86(100)	1.887	1.96
Home	6(2.15)	0(0.00)		
<b>Type of birth</b>				
Vaginal delivery	192(69.06)	59(68.60)	.006	0.517
Cesarean section	86(30.93)	27(31.39)		
<b>Gestational age</b>				
Premature (<37weeks)	25(8.99)	6(6.97)	.343	.369
Full term (37-42week)	253(91.00)	80(93.02)		
<b>Rooming-in</b>				
Yes	236(85.61)	42(15.10)	.343	.558
No	73(84.88)	13(15.11)		
<b>Antenatal care follow up</b>				
Once	53(19.06)	24(27.90)	49.482	.027*
Twice	46(16.54)	13(15.11)		
Three times	106(38.12)	19(22.09)		
Four times	73(26.25)	30(34.88)		
<b>Religion</b>				
Adventist	35(12.58)	10(11.62)	6.680	.927
Muslim	23(8.27)	9(10.46)		
Catholic	94(33.81)	27(31.39)		
Protestants	41(14.74)	15(17.44)		
Others	85(30.57)	25(29.06)		
<b>Knowledge score</b>				
Good	243(87.4)	63(73.25)	7.349	.002*
Poor	35(12.58)	23(26.74)		
<b>Attitude score</b>				

Good	236(84.89)	42(15.10)	37.400	.014*
Poor	63(73.25)	23(26.74)		

### Binary logistic regression for the predictors associated with exclusive breastfeeding

To identify factors associated with the practice of exclusive breastfeeding, a multivariable logistic regression model was performed and the results are presented in Table 6. The multivariate logistic regression analysis showed the marital status of mothers, It was noted that married women (OR = 0.270; 95%CI = 0.160–0.457,  $p < .001$ ) are likely to have good practice than their counterparts. Since the p-value is less than 0.001, the relationship between marital status and EBF is statistically significant at the 0.1% level. The education status of women who had a high school degree (OR = 0.150; 95CI = 0.073–0.307;  $p < .001$ ), College (OR = 0.090; 95CI = 0.035–0.233;  $p < .001$ ) are likely to have a good practice of EBF compared to their counterparts. Since the p-value is less than 0.001, the relationship between educational status and EBF is t statistically significant at the 0.1% level. Mother having two or more than two children (OR = 0.026; 95%CI = 0.008–0.084,  $p < .001$ ), (OR = 0.074; 95%CI = 0.026–0.214,  $p < .001$ ) are likely to have a good practice of EBF. Since the p-value is less than 0.001, the relationship between high parity and EBF is statistically significant at the 0.1% level. Mothers with good knowledge (OR = 2.535; 95%CI = 1.399–4.594,  $P = 0.002$ ) are likely to have a good practice of EBF. Since the p-value is less than 0.05, the relationship between good knowledge and EBF is statistically significant at the 5% level. Furthermore, positive attitude (OR = 2.051; 95%CI = 1.149–3.662,  $P = 0.015$ ) are likely to have a good practice of EBF. And this indicates that there is an association between positive attitude and EBF is statistically significant at the 5% level.

Table 6

Multivariate logistic regression for the predictors associated with exclusive breastfeeding

Variables	B	S. E	Wald	Exp(B)	95% CI	P-Value
<b>Marital status</b>						
Married	-1.308	.268	23.798	.270	(.160-.457)	p<.001
Single				1		
<b>Education status</b>						
Primary				1		
High school	-1.899	.366	26.864	.150	(.073-.307)	p<.001
College	-2.410	.486	24.576	.090	(.035-.233)	p<.001
<b>Partner level of education</b>						
Primary				1		
High school	-.320	.298	1.156	.726	(.405-1.301)	0.282
College	.308	.334	.853	1.361	(.708-2.618)	0.356
<b>Parity</b>						
P1				1		
P2	-3.661	.604	36.716	.026	(.008-.084)	p<.001
P≥3	-2.600	.539	23.258	.074	(.026-.214)	p<.001
<b>Antenatal care follow up</b>						
Once				1		
Twice	-.471	.399	1.396	.624	(.286-1.364)	0.237
Three times	-.927	.350	7.006	.396	(.199-.786)	0.008
Four times	-.097	.328	.088	.908	(.477-1.726)	0.767
<b>Knowledge score</b>						
Good	.930	.303	9.399	2.535	(1.399-4.594)	0.002
Poor				1		
<b>Attitude score</b>						
Positive	.719	.296	5.907	2.051	(1.149-3.662)	0.015
Negative				1		

1:Reference category. SE: standard error; CI: confidence interval.

## Discussion

To our best knowledge, this was the first study that to investigate knowledge, attitude, and practices towards EBF among mothers attending health facilities in Rwanda and it can help as the baseline towards policy change. The study site, as the main district hospital has a particular benefit of providing policy guidance in lower health facilities. Women with good knowledge and a positive attitude on EBF had a higher prevalence of EBF practice and there was a strong belief that breast milk alone for the first 6 months of infant life is enough for child growth. The overall aim was to provide information about mothers' knowledge and attitudes towards practice of EBF and to identify factors predicting EBF. The authors were pleased to find that the prevalence of EBF among women of reproductive who had at least one child aged 6 months or younger at MDH in Rwanda was low 76.4 % compared to the WHO recommended EBF coverage of 90 % [9] and the national target of EBF coverage > 90% [14]. This figure was close to that seen in another study conducted in Nigeria 75.6% [2] however, it was better than the figures reported in the previous studies conducted in India 36.25% [24], in Zimbabwe 36% [25], in the United Arab Emirates only 16.9% [26], and in the United Kingdom was 26.2% [27]. This value indicates that improving EBF practice for children is more probably due to the improved awareness of lactating mothers which is resulted from the expansion of health information on the importance of EBF by the health personnel at any level of health institutions. It is of utmost public health importance that optimal breastfeeding practices, particularly EBF, are encouraged and practiced promoting the growth, survival, and health of children. Furthermore, the more frequently reported reasons for why mothers stopped breastfeeding were maternal perceptions of breast milk production was insufficient to grow children, HIV, and unintended pregnancies, baby gets hungry and being thirsty, cultural belief and the need to introduce herbal medicine for cultural, work schedule, early and single motherhood, and poverty". Finally, maternal perception of having an inadequate breast milk production which corroborates findings in other studies [19, 26].

Furthermore, Our findings of this study show that the majority had 84.1% had good knowledge, 82.1% had a positive attitude towards EBF were high. We found that mothers had good knowledge which was similar to previous studies conducted in India 92.5% [24], in Zimbabwe 89% [25], and in Nigeria 94.0% but was higher than studies conducted in the United Arab Emirates 51.2% [26], and in Ghana 45.8 [17]. However, 82.1% of them presented a positive attitude, the finding was in line with previous studies conducted from Nigeria which is 84.7%, in the United Kingdom was 84.7% [27], Ghana was 82.6% [17], and Mizan Aman town was 89.5% in Ethiopia [21], in Debre Birhan, Ethiopia which found 97.5 % [28]. However, it was higher than previous studies conducted in Dabat Health Center, Northwest Ethiopia 76% [22]. Contrary to this, the finding is higher than a study conducted in China 14.50% [1]. Good knowledge and a positive attitude were more likely to practice EBF for 6 months. The higher EBF rate in Rwanda could be further explained by the fact that Rwanda has prioritized and intensified intervention with a focus on health promotion efforts to increase community knowledge and skills on EBF interventions and promote health-seeking behavior [14]. Mothers who had higher knowledge were also likely to have a positive

attitude than their counterparts concerning the practices of EBF. Similar to our findings, studies that report high maternal knowledge on EBF also report a high prevalence of the practice of exclusive breastfeeding[17]. This finding is also in line with the study conducted in China that reported that positive maternal attitudes toward breastfeeding are associated with continuing to breastfeed longer and having a greater chance of successful breastfeeding, Besides that, maternal education plays a role in attitudes toward breastfeeding[1]. Despite high baseline attitudes and knowledge levels in these women, their scores increased significantly following training. This suggests that it is likely that the training which includes changing cultural and personal breastfeeding attitudes, was accountable for their high scores [27].

According to a multivariate analysis, practicing exclusive breastfeeding demonstrated the factors to be associated with EBF included married, maternal with a college degree or higher level of education, multiparity, having good knowledge, and a positive attitude toward EBF. However, mothers with a college degree or higher level of education were more likely to report a higher practice of EBF than their counterparts. Mothers with higher levels of education may be able to comprehend that it should be practiced for up to six months and appreciate the benefits of EBF to their infants and more motivated to practice it. This result is consistent with other previous studies conducted among women, which confirmed the positive impact of a high level of education on the subject's knowledge related to health topics[17, 19, 26]. This is contrary to the result obtained from a study conducted in Debre Berhan District, Central Ethiopia[28]. Mothers with a higher level of education, their chance of practicing EBF significantly reduced. This could be because educated women have better job opportunities than illiterate mothers, so they don't have enough time to maintain EBF practice. Besides, maternal education was associated with knowledge of the importance of health benefits of breast milk despite the perceived inconveniences or discomfort of breastfeeding in public and may be able to comprehend and understands the benefits of EBF. Besides, less educated mothers had more positive attitudes toward formula use and were likely to introduce formula earlier than more educated mothers[1]. Mothers who had one child were less likely to exclusively breastfeed their babies when compared to mothers with two or more children. This finding was consistent with study findings in Gwanda District, Zimbabwe study where they concluded that multiparity was a major factor of EBF[25]. Another factor that was found associated with the practice of EBF was having good knowledge of EBF. Mothers who had good knowledge were more likely than their counterparts with poor knowledge in EBF to report practicing it. Similar to our findings, studies that report high maternal knowledge on EBF also report a high prevalence of the practice of EBF[17, 37]. In addition, positive maternal attitudes were found to be significantly associated with the practice of EBF in MDH. This finding was consistent with a study in positive maternal attitudes toward breastfeeding are associated with continuing to breastfeed longer and having a greater chance of successful breastfeeding[1].

However, the major reasons for not breastfed exclusively "Breast milk was insufficient." This should be one of the contributing factors to the prevalence of stunting among children under 5 years in Rwanda (0–59 months) and still unacceptably high as 38% and 15% of children who were stunted at the age of two months was caused by poor nutrition during pregnancy [11]. It has been shown that other non-exclusive

breastfed infants have significantly higher stunting rates compared to EBF children[31]. Stunting has been documented in several studies as a contributing factor for children's poor motor and cognitive development. Cohort studies have shown stunting before age 2–3 years predicts poorer cognitive and educational outcomes in later childhood and adolescence [31, 32]. Recent research by Black et al found that in low-income countries, suboptimal breastfeeding results in approximately 800,000 infant deaths annually, or 11.6 percent of deaths among children under five years of age[31]. Rwanda has made significant reductions in under-five mortality from 196 per 1000 live births in 1993 to 26 per 1000 live births in 2020[33]. Further, changes in attitudes can be accomplished by informing the protective effects of EBF practices “starting within the first hour of birth, longer-duration breastfeeding is associated with protection against childhood infections, increases in intelligence and reductions in the prevalence of overweight and diabetes[24]. Breastfeeding protects against breast cancer and improves birth spacing”[34]. An 8% global rise in EBF to six months, however, it is estimated to have decreased child mortality by 1,000,000, decreased fertility by 600,000, and saved billions of dollars in breast milk replacement in nations[35]. Married mothers were likely to have good practices more likely than single mothers. Similar findings have been reported previously in Ethiopia[36]. Furthermore, good practice increases with the number of ANC visits this finding was similar to the studies conducted in Tanzania and Zimbabwe respectively [25, 37]

Apart from mortality, a lack of EBF has been associated with considerable morbidity. Mix fed children has a higher prevalence of diarrhea and respiratory infections than EBF children [31, 37]. Appropriate complementary feeding recommended by the WHO to start at 6 months of age when breast milk is not sufficient to maintain a child's energy, and nutrition requirements should be encouraged [37]. Therefore, breastfeeding strategies need to be improved and scaled up, especially in the early initiation of breastfeeding and EBF. There is also a need to raise community awareness and education about the benefits and adverse effects of mixed feeding[38]. EBF-support policies such as the Baby-Friendly Hospital Initiative (BFHI) and the Infant, and Young Child Feeding Initiative (IYCF) that have been supported by the Government of Rwanda do not seem to operate optimally and there is a need to ensure effective implementation of these initiatives. Besides, beyond the normal facility channel, creative strategies to increase women's awareness and knowledge of breastfeeding in general and in EBF are needed. One solution that may be suggested to Rwanda will be to use community EBF promotion peer counselors or women's groups that have been shown recently in community trials to increase the length of EBF[14]. It was noted that there was a high antenatal attendance during a previous pregnancy, and the majority of the women delivered at a health facility. However, there are opportunities to counsel women on EBF during antenatal and postpartum periods, as few women reported receiving advice on EBF. Teaching knowledge without change in attitude is a failure, which agencies involved in health education should seriously consider. Thus, there is a strong need that when knowledge is conveyed it should be done in a way so that the attitude also changes for the good and help to improve the practices of EBF. We may have given the right information, but our research points out those efforts are needed to improve attitudes.

## Study Recommendations And Limitations

The recommendation includes that in a future investigation should be done on both breastfeed and non-breastfed mothers to detect lacking and area to work it will increase their knowledge, attitude, and encourage EBF practices. However, health education sessions should promote teaching mothers about the benefits of EBF. Also, health education should be provided at the community level to obtain an optimal EBF rate. Rwanda has a higher rate of EBF but it is still below the WHO recommendation, it is time to discover cultural and traditional practices that lead to the suboptimal practice of EBF. EBF promotion should be given attention in health planning: health care providers and decision-makers should comprehensively address these issues to improve EBF practices in the community. Improving access to recommend child feeding information during routine child and maternal health services and strengthening antenatal and postnatal nutrition therapy. There is a need for greater efforts to promote and support the healthy practice of exclusive breastfeeding. The planning of public health interventions to promote longer and increase the number of mothers who adhere to achieve the better development of children, and also to implement the policymakers, an intervention that could improve knowledge, attitude, behaviors, and practices of women concerning EBF.

The limitation of a cross-sectional study design is discussed in this research. However, the limitation of the study is that it was conducted in government hospitals involving mothers that went for antenatal and postnatal care hence, the findings of this study may not be representative, of the situation of EBF in the entire community. Another limitation is that the questionnaire was long, which led to the failure to report complete data concerning some questions. The use of convenience non-random collection sampling technique interfered with the representativeness of the collected data and self-reporting may have presented recall bias to the study. Finally, this study considered a sample of mothers who attending MDH which could lead to different results than those of analogous samples in the other health facilities.

## Conclusions

The findings of this study the knowledge, attitude, and practice of mothers towards EBF was found to relatively high. The prevalence of EBF is still below WHO's recommendation. The findings of this study highpoint to the strength that policymakers and healthcare providers direct their efforts to provide evidence-based information and recommendations to women on the benefits of breastfeeding. These results may be supportive of policymakers and managers as they plan educational interventions on breastfeeding during both pregnancy and hospital admissions during delivery. Implementing these efforts is fundamental to growing rates of exclusive breastfeeding for the first six months of a child's life and the subsequent improvement in both the women's and the child's health outcomes.

## Abbreviations

EBF: Exclusive Breastfeeding, WHO: World Health Organization, UNICEF: United Nation Children's Fund, WHA: World Health Assembly, KAP: Knowledge, Attitude, and Practice, MDH: Masaka district hospital,

FAO: Food and Agriculture Organization, BFH: Baby-Friendly Hospital, BFHI: Baby-Friendly Hospital Initiative, HIV: Human Immunodeficiency Virus, CHUK: University Teaching Hospital of Kigali, ANC: Antenatal Care, DHS: Demographic and Health Survey, SPSS: Statistical Package for Social Sciences, IYCF: Infant and Young Child Feeding.

## **Declarations**

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### **Authors' contributions:**

DCJP: project design, data collection, data analysis, and paper writing and given final approval of the version to be published and was a major contributor in writing the manuscript.

KFM; contributed to data interpretation, manuscript and grammar revisions

NJ: collected data, participated in data interpretation and manuscript revisions.

JL: Reviewed the manuscript and approved the final version for submission. All authors reviewed subsequent manuscript drafts and approved the final version.

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### **Availability of data and materials:**

All data generated or analyzed during this study are included in this published article

### **Ethics approval and consent to participate:**

The study protocol was approved by Masaka District Hospital. Approval notice: Ref: 132/MSK/DH/2020.

Informed written consent was found from participants after explaining the purpose of the study, participation method, and advantages and disadvantages of participation. Mothers who participated in the research were coded with numbers to make the information anonymous.

### **Consent for publication:**

Not applicable

## Competing interests:

The authors declare that they have no competing interests

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