

# Knowledge, Attitude and Practices towards Nutrition and Influencing Factors among Pregnant and Lactating Women in Kigeme Refugee Camp, Rwanda

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## ABSTRACT

This study aimed to determine the level of knowledge, attitude and practices towards nutrition and influencing factors among pregnant and lactating women. This was a descriptive cross-sectional study conducted in Kigeme refugee camp-Rwanda using both quantitative and qualitative methods. The questionnaires were distributed to 220 pregnant and lactating women that were randomly selected and conducted four focus groups discussion with pregnant and lactating women and to 14 community health workers in order to determine the nutrition knowledge attitude and practices among pregnant and lactating women (0 to 6 month post-partum). SPSS 20.0 and thematic analysis was used to analyze gathered data. The results showed that more than half of participants 53.6% had high knowledge, while 46.4% had moderate knowledge. This was supported by the qualitative findings which confirmed that the participants had high nutrition knowledge. The level of attitude shows that 67.2% has negative attitude while 32.7% has positive attitude; regarding nutrition practice, 71.8% had poor nutrition practice while 28.2% had good nutrition practice. After running multivariate analysis, the variables independently associated with practice towards nutrition were purchasing the food in the market as source of food (AOR=14.987; 95%CI=1.650-4.231; P=0.001) and attitude (AOR=18.896; 95%CI=2.674-10.537; P<0.001). The study concludes that the participants have high knowledge toward nutrition but most of them have negative attitude and poor nutrition

practices. The poor nutrition attitudes influenced by limited source of food and attitude.

**Key words:** knowledge, attitude, practices, nutrition and influencing factors.

## 1. INTRODUCTION

Scientists explain that a minimum of 50 brain chemicals or neurotransmitters undergoes the effects of consuming food and micronutrients by the children during their first 1,000 days. Negative impacts resulted from inadequate nutrition during this exceptional period are long lasting and cannot be reversed, with effects far beyond their physical health to affect their intellectual development. <sup>[1]</sup>

Required nutrient should be increased to pregnant and lactating women to upkeep the fetal and infant development as well as growing along with modifications in maternal tissues and metabolism. The role of adequate nutrition in lactation period is much important than nutrition in pregnancy period. <sup>[1]</sup>

In low-income countries, lactating mothers are typically considered as nutritionally vulnerable group. They are subjected to nutritional stresses because of nursing process. The increased risks in high maternal mortality of mothers are often due to are frequent pregnancies followed by lactation. A nursing mother produces 0.7 to 0.8 liters of milk per day, containing 330 milligrams of calcium per liter. This

requires an extra energy expenditure of at least 500 calories per day. [2]

Education about nutrition of pregnant women has proven a significant impact in improving the women knowledge and practices with regard to appropriate diet to be taken while pregnant. There is a need to emphasize on pregnant women's nutritional knowledge, attitudes, and their practices because these were found to be less understood. [3] Socio demographic factors which influence the nutritional knowledge and practices have more impact their health and wellbeing of children. [4]

Many researches show that women are knowledgeable on good nutrition however there is a need of improvement for effective practice. In additional to that, their knowledge and practices are more influenced with different social/environment. [4, 5, 6]

Natural disasters and emergencies have a devastating impact on people's lives. These impacts become more severe to women and affect, them both physically and mentally. Around the world, some refugee women become malnourished and others lose confidence and strengthen to breastfeed their infants. With support networks shattered, there may be even more demands on a mothers time to get food for their families, find shelter and plan for an increasingly insecure future. [7]

Congolese refugees that live in Kigeme refugee camp (located in country Rwanda) fled their country and arrived in Rwanda in 2012 due to war that divested the Eastern and Western part of Congo. Like in other refugee camps in the world, refugees camp in Rwanda also live in a difficult situations that are negatively affected by their nutritional status due to limited access to some type of diverse food accompanied with a lack of space to grow crops in order to get harvest that may supplement insufficient food assistance received from World Food Program (WFP) and United Nations High Commissioner of Refugees (UNHCR).

The assessment conducted in 2013 and 2017 in Kigeme refugee clearly pointed out the prevalence of stunting and anemia respectively among children and pregnant/lactating women in which stunting was 23.8% in 2013 and 28.8% in 2017 while 9.8% of women had anaemia in 2017 despite different cash for food assistance being provided on regular basis and awareness campaigns on nutrition which were being conducted. [8, 9] This raised up a concern to know much about women knowledges, attitude and practices on how to prepare an appropriate dietary for pregnant and lactating women and associated influencing factors.

Thus, the study has the general objective of determining the level of knowledge, attitude and practices towards nutrition and influencing factors among pregnant and lactating women in Kigeme Refugee camp. The specific objectives are:

- To determine the levels of knowledge and attitude towards nutrition among pregnant and lactating women in Kigeme refugee camp;
- To determine nutrition practices among pregnant and lactating women in Kigeme refugee Camp;
- To determine factors influencing to practices towards nutrition among pregnant and lactating women in Kigeme refugee camp.

## **2. METHODOLOGY**

To achieve the objective of this study the following were used: research design, study population, sample size, data collection methods, data analysis procedures.

### **2.1 Research Design**

This was a descriptive cross sectional study. Both qualitative and quantitative methodologies were used to access the level of knowledge, attitude and practices towards nutrition and influenced factors among pregnant and lactating women (0-6 months postpartum) for pre-defined period. Primary data were collected through using questionnaires and conducted

four (4) focus group discussions (FGDs). The purpose of the FGDs was to supplement the responses from the questionnaires.

## **2.2 Target Population**

The Target population was pregnant and lactating women (0 to 6 postpartum) who are Congolese refugees living in Kigeme refugee camp. In this study, pregnant and lactating women were in the same group as pregnant women have to take both macronutrients and micronutrients including vitamins which should be also continue to be taken during breastfeeding. [10]

Refer to statistics of March 2019 given by Kigeme refugee camp Health post, in total 488 target population (280 pregnant women and 208 lactating women). In addition to that, 22 community health workers who are refugees and live in Kigeme refugee were considered as target population in this study.

## **2.3 Sample design**

In order to have a representative sample; 14 community health workers were requested to provide relevant information concerning nutrition knowledge, attitude and practices. Pregnant and lactating women were consulted based on the total number of pregnant and lactating women attended prenatal consultation during the month of March 2019. The sample size of 220 pregnant and lactating women was drawn from 488 pregnant and lactating women by using SLOVIN'S Formula. The study employed a simple random sampling procedure to select pregnant and lactating women and purposeful sampling to select community health workers.

## **2.4 Data Collection Methods**

Data collection was done through questionnaire for pregnant and lactating women and FGDs guide for community health workers and pregnant and lactating women. FGDs were conducted through forming 4 focus groups where each group comprised of 12 participants.

FGDs guide which consist 5 open ended questions were used to collect qualitative data. Close ended questions were

used to collect quantitative data which emphasis on collection of information related to (1) current nutrition practices that are available and used by pregnant and lactating women (2) nutrition knowledge and attitude among pregnant and lactating women (3) the influencing factors on knowledge and practices towards nutritionals among pregnant and lactating women. This questionnaire was developed with reference to the existing researches conducted and it comprised of five parts which will be tested for validity and reliability. Part I consists 6 questions related to socio demographic; Part II consists of 15 knowledge variables; Part III consists 6 questions related to nutrition practices, part IV have 12 items measuring attitude toward nutrition, using a 4-point likert scale (0= strongly disagree, 1= disagree, 2= agree, and 3= strongly agree) while Part V consists 4 questions related to influencing factors to nutrition. For Part II, 15 knowledge indicators were used to evaluate knowledge by using dichotomous response of "yes" or "No". A score of 1 was given for correct answer and 0 for the wrong answer. They were scaled on scale ranging from 1 to 15 after analyzing their knowledge, from 1 to 6 after analyzing their practice and 1 to 12 after analyzing their attitude. The knowledge scores were categorized as good (>\_75%), moderate (51% to 74%) and poor (<\_50%). [11] The attitude score were categorized as positive attitude if the participants' attitude score > median and as negative attitude if the participants' attitude score ≤ the median. The practice score were categorized as good if the participants' practice score > median and as poor if the participants' practice score ≤ the median. [6]

## **2.5 Validity and reliability of research instruments**

### **Reliability of research instruments**

Cronbach' Alpha coefficient was used to measure internal consistency of the research tool. Pilot study involved 5 pregnant and lactating women from Kigeme refugee camp were selected randomly. The findings from pilot study were that the

Cronbach's alpha coefficient equal to knowledge (0.81), attitude (0.75) and practice (0.80), thus the research instrument proven to be reliability.

### Validity of research instruments

Validity of research instruments was tested by conducting pre-test to 10 women and pregnant women living in Mugombwa refugee camp, to determine whether the truly measures that which it was intended to measure or how truthful the research results will be and show the extent to which the instrument measures what it purpose to measure. The results showed that the instrument is valid by considering its CVI equalled to 0.75.

### 2.6 Data Analysis Procedure

Data from the questionnaire were cleaned and then analyzed using Statistical Package for Social Sciences (SPSS, 20.0). Data from the scores of the knowledge, attitude and practices assessment were analyzed using the methodology and then data were entered in SPSS 20.0 for further analysis.

The data were analyzed and interpreted in the baseline of the objectives of this study. Descriptive statistics such as means, medians, modes, percentages and standard deviations were computed for socio-environmental characteristics. A p-value  $p < 0.05$  were considered statistically significant for both categorical and continuous variables. Pearson's Correlation test was used to determine the interactions between socio-demographic characteristics and nutrition, knowledge, attitude and practice.

The qualitative data were analyzed by using thematic analysis by emphasizing on pinpointing, examining and recording themes within data.

### 3. Research Findings

The purpose of the study was to determining the level of knowledge, attitude

and practices towards nutrition and influenced factors among pregnant and lactating women in Kigeme Refugee camp. Findings were summarized according to specific research objective.

### 3.1 Socio -Demographic Characteristics of Participants

Socio demographic characteristics of participants including age, marital status, mothers educational level, source of food, family size and occupation.

**Table 3.1: Participants' socio-demographic characteristics (n=220).**

Variables	Frequency	Percentage
<b>Age</b>		
< 20 years	15	6.8
20-29 years	122	55.5
30-39 years	57	25.9
40 - 49 years	25	11.4
50 years +	1	0.5
<b>Marital status</b>		
Married	60	27.3
Cohabiting	114	51.8
Divorced	22	10.0
Widowed	8	3.6
Separated	16	7.3
<b>Mother's education level</b>		
No formal education or cannot read	30	13.6
Primary schools	112	50.9
secondary schools	78	35.5
<b>Occupation</b>		
Housewife	118	53.6
Business woman	67	30.5
Paid workers	3	1.4
Students	6	2.7
Community volunteers	26	11.8
<b>Source of food</b>		
Purchasing in the market	126	57.3
Garden/farm	31	14.1
Both purchasing and garden / farm	55	25.0
Other	8	3.6
<b>Family Size</b>		
Two	10	4.5
Three	52	23.6
Four	92	41.8
Five and Above	66	30.0

Source: Primary data

### 3.2 Level of Knowledge and attitude towards nutrition among pregnant and lactating women

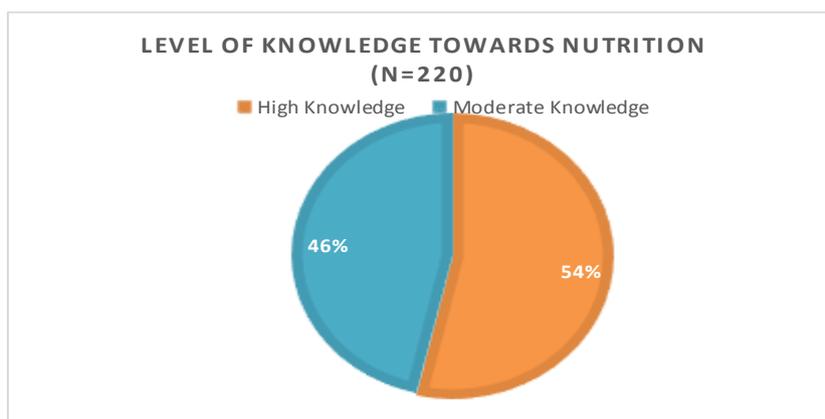
The first specific objective of this study was to determine the levels of knowledge and attitude towards nutrition among pregnant and lactating women.

**Table 3.2: Knowledge toward Nutrition among pregnant and lactating women (n=220).**

Variables		Frequency	Percentage
A balanced diet is important during pregnancy and lactation	Yes	220	100.0
	No	0	0.0
Women nutrition during pregnancy and lactation period is different from others	Yes	217	98.6
	No	3	1.4
Iron is a source of Vitamin	Yes	186	84.5
	No	34	15.5
The daily recommended intake of iron for a woman during pregnancy is 27 mg	Yes	219	99.5
	No	1	0.5
Pregnant and lactating have to consume intake of protein on daily diet	Yes	215	97.7
	No	5	2.3
During pregnancy, a woman needs more folic acid and iron that a woman who is not pregnant	Yes	205	93.2
	No	15	6.8
A Pregnant woman must have to take folic acid daily diet	Yes	214	97.3
	No	6	2.7
Women should take diet which rich in calcium daily during pregnancy and lactation period	Yes	219	99.5
	No	1	0.5
fatty acids are essential for brain and retina development of fetus	Yes	37	16.8
	No	183	83.2
Nutrients deficiency during pregnancy and lactation could affect health status of mothers and baby	Yes	220	100.0
	No	0	0.0
If women was a normal weight before pregnancy, she should gain weight between 11.5 kg to 16.0kg during pregnancy.	Yes	207	94.1
	No	13	5.9
Body Mass Index (BMI) of less than 18.5 kg/m2 is a suitable weight during pregnancy	Yes	73	33.2
	No	147	66.8
Additional energy needs should be tailored based on the woman's BMI before pregnancy	Yes	68	30.9
	No	152	69.1
Underweight mother can affect baby well-being and growth.	Yes	211	95.9
	No	9	4.1
Obese women are at an increased risk of several pregnancy problems	Yes	43	19.5
	No	177	80.5

Source: Primary data

Table 3.2 show the frequency of participants responded of correct responses relatively to the variables, indicating 77.4% correct responses.



Source: Primary data

**Figure 3.1: Level of knowledge towards nutrition among pregnant and lactating women (n=220)**

The findings presented in table 4.3 shows that the mean of knowledge score of total sample was 11.6 (0.93), the maximum knowledge score is 14 while minimum score in 9. The knowledge scores were categorized as high (>\_75%), moderate (51% to 74%) and poor (<\_50%) thus more than half of participants 53.6% (n=118) had

high knowledge level, 46.4% (n=102) had moderate knowledge level.

The findings from qualitative primary data which supplement the quantitative findings show the knowledge that pregnant and lactating women have in taking care of themselves including taking balanced diet, rest enough, respect the rules

of exclusive breastfeeding, ensuring hygiene, attending antenatal services. Besides this, they know that they need the support of husband: *“The community members know that the women have to feel well so that she can deliver in good conditions. The support of husband is mandatory needed so that the women can find a time to rest”* (FGD, 1, 2, 3, &4).

Concerning how women can prevent being anemic, in all FGDs, they responded that women have to take balanced diet and micronutrient (fer and folic acid). *“In the camp, women are aware that they have to take balanced diet and to attend antenatal consultation for more support in order to prevent anemia which results in stunting,*

*premature birth, a low weight baby”*. (FGDs 1&2);

They also responded that: *“Pregnant and lactating women in the camp know that the measures of preventing anemia include taking balanced diet, eat enough vegetables and fruits and also taking folic acid during the first three months of pregnancy however the practice of the above is low due to poverty”* (FGDs 1,2,3,&4).

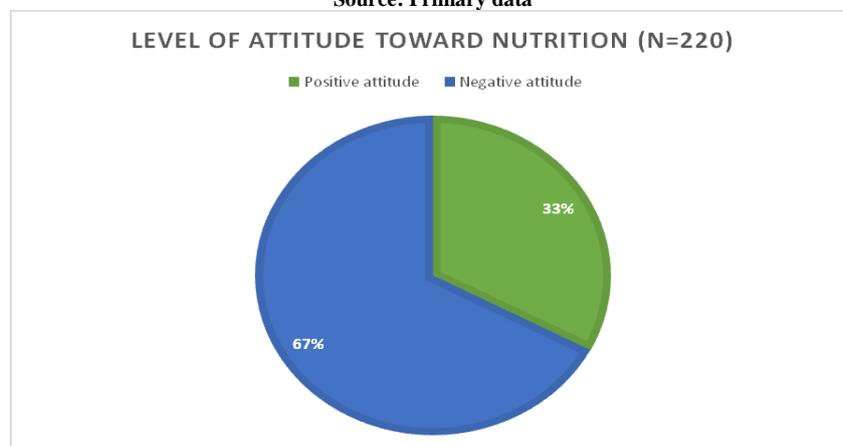
### Level of Attitude towards nutrition among pregnant and lactating women

Attitude was measured using 12 variables on nutrition among pregnant and lactating women, using a 4-point Likert scale (0= strongly disagree, 1= disagree, 2= agree, and 3= strongly agree).

**Table 3.3: Attitude toward Nutrition among pregnant and lactating women (n=220).**

Variables		Frequency	Percentage
Preparing a balanced meal is time-consuming	Disagreed	212	96.4
	Agreed	8	3.6
It is important for mothers to know about preparing a balanced meal	Disagreed	1	0.5
	Agreed	219	99.5
It is not vital to eat a balanced meal if already gave birth	Disagreed	194	88.2
	Agreed	26	11.8
A nutritious meal can come from one’s own small garden	Disagreed	163	74.1
	Agreed	57	25.9
I should eat fruits only when I feel like	Disagreed	214	97.3
	Agreed	6	2.7
Vegetables must be overcooked to kill microbes	Disagreed	87	39.5
	Agreed	133	60.5
Self-view of nutritional status is important	Disagreed	16	7.3
	Agreed	204	92.7
Hygiene is more important than food and nutrition	Disagreed	99	45
	Agreed	121	55
Taking supplements is better that eating food	Disagreed	172	78.2
	Agreed	48	21.8
Processed foods are generally better that raw foods	Disagreed	219	99.5
	Agreed	1	0.5
It is not easy to maintain good nutrition for a poor family	Disagreed	24	10.9
	Agreed	196	89.1
Eating a variety of foods in moderation is key to balanced nutrition	Disagreed	20	9.1
	Agreed	200	90.9

Source: Primary data



Source: Primary data

**Figure 3.2: The level attitude toward Nutrition among pregnant and lactating women (n=220).**

Nutrition attitude level was categorized as positive attitude if the participants' attitude score > median and as negative attitude if the participants' attitude score ≤ the median. Table 3.3 show that the mean score for nutritional attitude score was 8.66 (8.66/12 points), maximum attitude score equalled to 11 while minimum score is 4. The level of attitude were calculated in consideration with median equal to 9.00 and show that 32.7% (n=72) has positive attitude while 67.2% (n=148) has negative attitude.

### 3.3 Nutrition practices among pregnant and lactating women

Practice was measured using 6 variables on nutrition among pregnant and lactating women.

**Table 3.4: Nutrition practice among pregnant and lactating women**

Variables	Frequency	Percentage
How often she eat in a day		
Once	38	17.3
Twice	159	72.3
Three times	10	4.5
When I feel like	13	5.9
Type of food that she eats most of the time		
Carbohydrate rich meals	67	30.5
Protein rich meals	20	9.1
Variety of food in moderation	133	60.5
Drink alcohol when pregnant		
Yes	18	8.2
No	202	91.8
How often she eats fruits and vegetable		
Daily	4	1.8
Once in a week	43	19.5
Twice in a week	55	25.0
Occasionally	118	53.6
Presently and be took any supplements or vitamins		
Yes	208	94.5
No	12	5.5
Take any kind of herbal concoctions		
Yes	132	60.0
No	88	40.0

Source: Primary data



Source: Primary data

**Figure 3.3: Level of nutrition practice among pregnant and lactating women**

Nutrition practice levels were categorized as appropriate practice if the participants' practice score > median and as inappropriate practice if the participants' practice score ≤ the median.

The level of nutrition practice were calculated in consideration with median equal to 3.00 (max=6, min=0) and show that 71.8% (n=158) had poor nutrition practice

while 28.2% (n=62) had good nutrition practice (figure 4.3).

### 3.5 Factors influencing to practices towards nutrition among pregnant and lactating women

The factors influencing to practices towards nutrition among pregnant and lactating women were measured by using both quantitative and qualitative methods.

**Table 3.5: Factors influencing to practices towards nutrition among pregnant and lactating women (n=220)**

Variables	Frequency	Percent
The intake of certain food or items that are forbidden when pregnant or breastfeeding		
Yes	159	72.3
No	60	27.3
The reason why those foods or item are forbidden		
Cultural belief	16	7.3
Religious belief	67	30.5
Fear of death	3	1.4
Fear of giving birth to a big baby	2	.9
Lack of knowledge of food	23	10.5
Dislike of food item	16	7.3
Fear of gaining excessive weight	5	2.3
Medical conditions/disease	7	3.2
I am vegetarian	21	9.5
Factors that contribute to good nutritional practices		
Good socio economic status	153	69.5
Health/ nutrition information	64	29.1
Husband support	3	1.4
Factors that hinder you from taking adequate diet in pregnant and lactation		
Inadequate knowledge about the food	10	4.5
Low socio economic status	128	58.2
Lack of husband support	65	29.5
Forgetfulness	8	3.6
Ignorance	9	4.1

Source: Primary data

### Interactions between the dependent and independent variables

Pearson's correlation test was used to determine the interactions between the dependent variables (Nutrition practice) and independent variable (Nutrition knowledge and attitude, socio demographic variables). A p-value  $p < 0.05$  were considered statistically significant for both categorical and continuous variables.

**Table 3.6: Relationship between socio demographic variables and practice toward nutrition**

	Nutrition Practices of pregnant and lactating women		Chi-square	P- value
	Good practices n	Poor practices n		
<b>Age Group</b>			18.257	0.790
< 20 years	5	12		
20-29 years	36	87		
30-39 years	13	42		
40 - 49 years	8	16		
50 years +	0	1		
<b>Marital status</b>			28.002	0.260
Married	21	44		
Unmarried	25	80		
Divorced	7	17		
Widowed	5	6		
Separated	4	11		
<b>Mothers Education Level</b>			10.885	0.539
No formal education or cannot read	2	18		
Primary schools	33	80		
secondary schools	27	60		
<b>Mothers occupation</b>			27.025	0.303
Housewife	27	85		
Business woman	24	44		
Paid workers	1	1		
Students	0	5		
Community volunteers	10	23		
<b>Source of food</b>			67.174	<b>0.000</b>
Purchasing in the market	30	89		
Garden/farm	10	19		
Both purchasing and garden / farm	20	45		
Others	2	5		
<b>Family size</b>			18.146	0.446
Two	4	8		
Three	17	36		
Four	31	73		
Five and Above	10	41		

The findings presented in table 4.6 showed that only source of food as socio-demographic variables are significantly associated with practices toward nutrition among pregnant and lactating women ( $X^2=67.174$ ,  $P<0.001$ ).

**Table 3.7: Relationship between Knowledge, attitude and practice related to nutrition among pregnant and lactating**

	Nutrition Practices of pregnant and lactating women		Chi-square	P-value
	Good practices n (%)	Poor practices n (%)		
<b>Knowledge</b>			33.606	0.297
High level	62 (17.3)	118 (33)		
Moderate level	62 (17.3)	102 (28.5)		
<b>Attitude</b>			102.172	<b>0.000</b>
Positive	62 (17.3)	85 (23.7)		
Negative	62 (17.3)	135 (37.7)		

The findings presented in table 4.7 revealed that pregnant and lactating women with negative attitude about nutrition also demonstrated poor practice on nutrition. There was significant relationship between attitude and practice toward nutrition ( $X^2 =102.172$ ,  $p<0.001$ ). The findings also showed that there was no significant relationship between knowledge and practice toward nutrition among pregnant and lactating women.

Variables that were significantly related with practices toward nutrition in table 3.6 and 3.7 were taken to multivariate analysis in table 3.8.

**Table 3.8: Multivariate analysis on factors associated with practice towards nutrition among pregnant and lactating women**

Variables	Practice towards nutrition			
	AOR	95%CI		P value
		Lower	Upper	
<b>Source of food</b>				
Purchasing in the market	14.987	1.650	4.231	<b>0.001</b>
Garden/farm	2.348	2.985	3.595	0.312
Both purchasing and garden / farm	6.286	3.007	3.465	0.422
Other	Ref			
<b>Attitude</b>				
Positive	18.896	2.674	10.537	<b>&lt;0.001</b>
Negative	Ref			

CI: Confidential Interval; AOR: Adjusted Odds Ratio

In multivariate analysis, among 8 variables considered 2 variables were significant while the other 6 variables were not significant. The socio-demographic factor, source of food: the participants who Purchased the food in the market were 14 times more likely to have good nutrition practice compared to those who use garden/farm and those who both purchased food in the market and use garden/farm (AOR=14.987; 95%CI=1.650-4.231; P=0.001).

Pregnant and lactating women with positive attitude on nutrition were 18 times more likely to have good nutrition practices compared to those who have negative attitude (AOR=18.896; 95%CI=2.674-10.537; P<0.001).

The findings were complemented by the qualitative findings collected through FGDs which show that there are forbidden

food or items in their community like are meat (both red and white meat). Cultural, religious belief, poverty and limited source of food were cited to influence practices upon maternal nutrition in FGD 1, 2, 3, and 4: “Some families have culture (considering their clan) of not eating meat. There are no clear reasons behind this culture but they know that is forbidden. A child born knowing that he/she doesn’t allowed to take those kind of food in her whole life” (FGD 1, 3, &4); “In the camp, most of the refugees are Adventist and there are few number of temoin de Johova; in their belief, they don’t eat some kind of meat like rabbit while in the camp this the most affordable meat” (FGD 1, 2, 3, &4)

They reported poverty as their main issue:”In general, refugees in Kigeme refugee camp are suffering for poverty related to insufficient food support from

WFP and for limited space to build kitchen gardens. The money that they receive is not enough to cover the nutrition needed by the family (they receive 7600 frw per person per month). They are also obliged to eat once or twice a day so that the amount of money they receive can cover the whole month. These are the reasons why most of the families cannot afford a balanced diet" (FGD 1, 2, 3 &4); "With this insufficient amount of money support, the family try to buy the most affordable food including maize flour and beans, they cannot buy fruits and vegetables or other nutrition needs every day" (FGD 1&2).

#### 4. DISCUSSION OF THE FINDINGS

The findings of this study of 220 pregnant and lactating women and 14 community health workers living in Kigeme refugee camp provides new and valuable insight into the knowledge, attitude, and practices towards nutrition and influencing factors. The majority of participants were aged between 20 -29 years (55.5%) and were cohabitating (51.8%). As for the participants' occupation and their source of food, above the half of participants (53.6%) are the house wife, 57.3% purchase the food in the market this means that they depend on food support provided by WFP/UNHCR. This results matches those observed in UNHCR, WFP Joint assessment Mission (2017) showed that most of the refugees highly dependent on food assistance to cover needs where refugees depend on WFP for 94.51% their total food consumption. [9]

One hundred eighteen of pregnant and lactating women (53.6%, n=118) had high knowledge level, and 46.4% (n=102) had moderate knowledge level. In line with the present findings, knowledge and practice on specific nutrition was assessed among 406 pregnant women after receiving education and showed the significant impact of nutrition education to pregnant and lactating women improving knowledge during this specific period. [3] Kigeme refugee camp has Nutrition education and counselling program which deliver different

nutrition education sessions which may contribute in improving nutrition knowledge of refugees including pregnant and lactating women.

The qualitative findings complemented the quantitative findings. The participants have a knowledge about what pregnant and lactating women can do to take good care of herself including taking balanced diet, rest enough, respect the rules of breastfeeding, ensuring hygiene, attending antenatal services. They know also that a balanced diet and taking of folic acid prevent pregnant women to be anemic. This finding is in agreement with that of WHO (2016) confirming that anemia is associated with a deficiency in iron, folate and vitamin A. [12]

The study reveals that majority (67.2%, n=148) have negative attitude and others (32.7%, n=72) has positive attitude. It shows also that 71.8% (n=158) of participants had poor nutrition practice while 28.2% (n=62) had good nutrition practice. Referring WHO (2016) recommendation, pregnant and lactating women have to eat four times a day but this study showed that 72.3% (n=159) of participants eat two times a day. [12] According to Kominiarrek, Michelle & Rjan, (2016) recommended that pregnant women have to take both macronutrients and micronutrients including vitamins which should be also continue to be taken during breastfeeding [10] but this study showed that 25% eat fruits and vegetables (the source of vitamins) twice a week while 54% of participants consume it occasionally. More than half of participants (60%) take or have taken herbal concoctions in pregnancy period which has negative effect to new born and mother herself.

This poor nutrition practices are also supported by the study done WFP & UNHCR (2014, 2017) stated that the food security status in the Rwandan refugee camps remains difficult with more than half (52%) of all household having inadequate food consumption. [8,9] This interpretation differs from that Ministry of Health who

found that there was a gap between knowledge and practice where the women take the proper nutritional during pregnancy and lactation period without knowing the reason. [13]

This study revealed that there was a significant correlation between sources of food, and nutrition attitude and nutrition practice score among pregnant and lactating women. The qualitative findings showed that the limited source of food, mothers' education level, religious belief, socio economic factors were the important predicting factors for practice. This finding is somehow in agreement with these observed in earlier study who suggested described the link between family income and source of food to be a good driver with the best practices of nutrition during pregnancy. [3] The current findings may be explained by the fact that refugees doesn't have enough space to cultivate they are obliged to purchased their food in the market by using only the money provided by WFP where refugees depend on WFP for 94.51% their total food consumption. [9] The challenge of lacking of farm and receiving insufficient money affect negatively their nutrition practices which may contribute to the persistency of cases of anemia among pregnant women and stunting.

## 5. CONCLUSIONS

Pregnant and lactating women demonstrated higher level of knowledge toward nutrition during pregnancy and lactation period. Regarding attitude, pregnant and lactating women showed negative attitude toward nutrition whereby most of participants thought that a nutritious meal cannot come from one's own small garden; vegetables must be overcooked to kill microbes; it is not easy to maintain good nutrition for a poor family; and Hygiene is more important than food and nutrition.

Pregnant and lactating women had poor nutrition practice which was statistically significant associated with source of food as socio- demographic factor. Nutrition practices were not statistically

significant associated with knowledge toward nutrition. Good nutrition practices among pregnant and lactating women was statistically significant associated with their positive attitude toward nutrition.

## ACKNOWLEDGEMENT

First and foremost, I thank Almighty God for protecting me during my research period. I also extend my thanks to the Mount Kenya administration and its staff, especially, Public Health department; my education became a quality-based knowledge to the best of their capacity.

Special thanks go to my supervisor Dr. Nicholas Ngomi, PhD for valuable orientations and supports that enabled me to reach at this stage. I also owe a profound thanks to my husband MPIMBAZIMANA Venuste for fully supporting me and financing my academics that went in line with advices.

## Abbreviations

**MIDIMAR:** Minister of Disaster Management and Refugee Affairs

**UNHCR:** United Nations High Commissioner of Refugees

**WFP:** World Food Program

**WHO:** World Health Organization

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How to cite this article: Iradukunda D, Ngomi N. Knowledge, attitude and practices towards nutrition and influencing factors among pregnant and lactating women in Kigeme refugee camp, Rwanda. *Gal Int J Health Sci Res*. 2020; 5(2): 98-109.

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