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Determinants of Malnutrition in Pregnancy among Women Receiving Antenatal Care at Fort Portal Regional Referral Hospital

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ABSTRACT

This study aimed to determine the prevalence and contributing factors of malnutrition in pregnancy among pregnant women receiving antenatal care (ANC) at Fort Portal Regional Referral Hospital (FRRH). Specific objectives included assessing the prevalence of malnutrition, socio-demographic factors, and individual-related factors associated with malnutrition. The research employed a descriptive and cross-sectional study design, involving 384 participants who completed structured researcher-administered questionnaires. Data were analyzed using Excel and SPSS to derive the study findings. The study revealed a malnutrition prevalence of 13.5% among pregnant women attending ANC at FRRH, with 12.2% classified as having moderate acute malnutrition and 1.3% as severe acute malnutrition. Socio-demographic factors such as age, marital status, education level, occupation, and income significantly contributed to malnutrition in this population. Additionally, individual-related factors, including knowledge about nutrition, HIV status, the number of children, and household size, were associated with malnutrition. The study recommends that the Ministry of Health and other healthcare policymakers implement feeding programs and provide food subsidies to pregnant women during ANC visits to reduce malnutrition prevalence. Health workers at FRRH should offer counseling on dietary intake, supported by the establishment of nutrition education and efficient monitoring systems at all levels of antenatal care.

Keywords: associated factors, malnutrition, pregnancy and women

INTRODUCTION

Maternal nutrition plays a critical role in the reduction of maternal morbidity and mortality. Women often become vulnerable to malnutrition during the periods of pregnancy which affects pregnancy outcomes [1-5].

Malnutrition is an umbrella term for poor nutrition, whether that is excess consumption of nutrients (over nutrition) or inadequate consumption or absorption of one or more nutrients under nutrition) while under nutrition includes being underweight for one's age, too short for one's age (stunted), dangerously thin (wasted) and deficient in vitamins and minerals (micronutrient malnutrition). Malnutrition is now a problem in both poor and rich countries. In developing countries, while widespread under nutrition and micro-nutrient deficiencies persist, obesity is also fast emerging as a problem [6-9].

Worldwide, malnutrition remains a major public health problem across the global despite the concerted efforts by state and none state actors [10]. Pregnant and lactating women (PLW), along with children, are among the most vulnerable groups of population during emergencies and droughts due to their higher nutritional needs and detrimental effects of poor nutrition on the health of the mothers and their children. Global data shows that 56% of pregnant women in low- and middle-income countries (LMIC) have anemia a key indicator of maternal malnutrition (Black et al, 2013). The prevalence of anemia which is highest among pregnant women in Sub-Saharan Africa (SSA) (57%), followed by pregnant

women in Southeast Asia (48%), and lowest prevalence (24.1%) was found among pregnant women in South America [10]. Malnutrition is known to increase the risk of poor pregnancy outcomes, including obstructed labor, premature or low-birth-weight (LBW) babies and postpartum hemorrhage. Severe anemia during pregnancy is associated with increased maternal mortality [11-21]. Besides, malnutrition among mothers has an intergenerational effect, with repeating cycles of malnutrition and poverty in the long run [22-26].

Previous studies in Africa have established that malnourished pregnant women are at increased risk of having LBW infants [10]. The link between LBW and poor health and nutritional outcomes later in life is also well established, with several studies reporting the association of LBW with malnutrition, poor growth and development, and increased morbidity and mortality in children [27-36]. Besides, poor nutrition during pregnancy, especially deficiencies of certain vitamins and minerals, have been associated with negative pregnancy outcomes for both the mother and the infant. Severe iron-deficiency anemia has been linked to preterm labor poor anthropometric measures and birth asphyxia [37-44]. Maternal malnutrition is caused by complex interaction of a multitude of factors [45-52]. Severe illness, breastfeeding and having several children below 2 years of age are negatively associated with maternal nutritional status, while higher maternal age and socio-economic status, and household food security have positive effect [53-60].

These records show that maternal malnutrition is more prevalence among pregnant women [60-67]. There are few studies carried out to examine contributing factors and effects of malnutrition among pregnant women [68-71]. Most of the studies have been carried out in developed countries with different contexts. A study in Uganda was needed to inform policy on how to best address the challenge of maternal malnutrition. It was against this background that a study was carried out to examine contributing factors and effects of contributing factors and effects of malnutrition among pregnant women attending ANC at FRRH.

METHODOLOGY

Study design

The study was descriptive and cross-sectional study designs were adopted to examine the prevalence and the contributing factors of malnutrition in pregnancy among pregnant women attending ANC at FRRH.

Study area

The study was conducted from Fort Portal Regional Referral Hospital. It is a hospital in the town of Fort Portal, in Kabarole District, Western Uganda.

Study population

The study involved all the pregnant women attending antenatal clinic at FRRH in Kabarole District.

Sample size

The sample size was calculated using the probability sampling formula below given by Kish Leslie (1965).

$N= Z^2pq/d^2$

Where, n = sample size

z = statistical certainty chosen

p = proportion of pregnant women with poor nutritional status

q = 1- p (percentage of pregnant women with good nutritional status)

d = precision desired

The value of p = prevalence of 48.38% for prevalence of malnutrition among pregnant women in Uganda (Shekar, Heaver & Lee, 2016).

$n = z^2 p (1- p) / d^2$

$= 1.96^2 \times 0.4838(1- 0.4838) / 0.05^2$

$= (3.8416 \times 0.4838 \times 0.5162)/ 0.0025$

$= 383.7567 \approx 384$

Therefore, this studied recruited **384** participants.

Sampling techniques

According to Collins & Hussey (2006), a sampling method is a technique used in selecting elements from a population that represents the population. The researcher

used simple random sampling method to select the study respondents.

Simple random sampling is a probability sampling technique in which a random selection is made to select the desired sample size of the study. The researcher randomly selected the study participants hence giving an equal chance for all the respondents to take part in the study. This avoided bias in the selection of the study respondents.

Inclusion criteria

All pregnant woman between the ages of 15-49 years, who did not have any complications in pregnancy and are attending antenatal care at FRRH.

Exclusion Criteria

Pregnant women who attended ANC, having complications during the pregnancy, did not consent to the study or were not in good metal state were excluded.

Data collection methods and tools

Hospital records were used to capture the nutritional status of pregnant women and pregnancy outcomes. Hospital records were used to collect some contributing factors such as HIV status. Other contributing factors were obtained using a researcher administered questionnaire. The researcher administered (face to face) questionnaire included variables in line with the study objectives.

Data processing and analysis

Data was entered, cleaned, and analysed by using SPSS version 20. Descriptive statistics were used to summarize data. Bivariate analysis was performed to control for the confounders. The p value of less than 0.05 was considered as a statistically significant result.

Ethical considerations

1. The permission to conduct this study was sought from Kampala International University. The study was granted ethical clearance certificate.
2. Participants to be enrolled were requested to sign consent after thorough explanation of purpose of the study, risks involved and use of data to be collected.
3. Numbers instead of names were used in all the questionnaires and laboratory forms.

RESULTS

Table 1: Demographic characteristics of respondents

Characteristic	Frequency	Percentage (%)
Age group		
15-19 years	21	5.5
20-29 years	184	47.9
30-39years	163	42.4
40 years and above	16	4.2
Place of residence		
Rural	273	71.1
Urban	111	28.9
Marital status		
Single	8	2.1
Married	374	97.4
Separated or Divorced	1	0.3
Widowed	1	0.3
Level of education		
No formal education	82	21.4
Primary	143	37.2
Secondary	51	13.3
Tertiary	108	28.1
Occupation		
Informal employment	180	46.9
Formal employment	73	19.0
House wife	58	15.1
Business Woman	66	17.2
Others	7	1.8
Household income level		
Less than 200,000=	21	5.5
200,000= to 499,999=	225	58.6
500,000= to 800,000=	102	26.6
Above 800,000=	36	9.4

Source: Primary data, 2020

From the table above, most of the respondents 184(47.9%) were in the age group of 20-29years; 163(42.4%) were in the age group of 30-39years, 21(5.5%) were in the age bracket of 15-19years and only 16(4.2%) were 40years and above.

This implied that most women attending ANC at FRRH were more sexually active in the ages of 20-29years and 30-39years respectively.

Regarding the place of residence, most of the respondents 273 (71.1%) were from rural areas and only 111(28.9%) were from

urban areas. Most women were from rural areas because most of FRRH's catchment area was covering villages. On the marital status of the respondents, most of the women 374(97.4%) were married; 8(2.1%) were single, 1(0.3%) was separated/divorced and likewise 1(0.3%) was widowed.

On the respondents' level of education, most of the women i.e., 143(37.2%) were of primary education level; 108(28.1%) were of tertially education level; 82(21.4%) had no formal education; and finally, 51(13.3%) were of secondary education level. In this case, over 50% of the pregnant women who were attending ANC from FRRH had not studied beyond primary level.

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The study established that most of the pregnant women who were attending ANC from FRRH 180(46.9%) were informally employed, 73(19.0%) were formally employed, 58(15.1%) were house wives; 66(17.2%) were business women and only 7(1.8%) were attending to other forms of employment.

Lastly on the household income levels, most of the pregnant women who were attending ANC from FRRH 225(58.6%) had a household income of Ushs200,000= to 499,999=; 102(26.6%) had a household income of Ushs500,000= to 800,000=; 36(9.4%) had a household of above Ushs 800,000=; and finally, 21(5.5%) had a household income less than Ushs200,000=.

This was measured using MUAC whereby a MUAC of <19.0cm meant severe acute malnutrition, 19.0-<22.0cm meant moderate acute malnutrition, and >22cm meant normal and results were as presented in the below.

Table 2: The prevalence of malnutrition in pregnancy among pregnant women attending anc at FRRH

MUAC	Frequency	Percentage (%)
<19.0 cm (SAM)	5	1.3
19.0 cm to <22.0 cm (MAM)	47	12.2
>22.0cm (Normal)	332	86.5
Total	**384**	**100.0**

Source: Primary data, 2020

The table above shows that nutrition assessment of the pregnant women attending ANC at FRRH; most of the respondents 332(86.5%) were normally nourished; 47(12.2%) were moderate acute malnutrition and finally, 5(1.3%) were severe acute malnutrition.

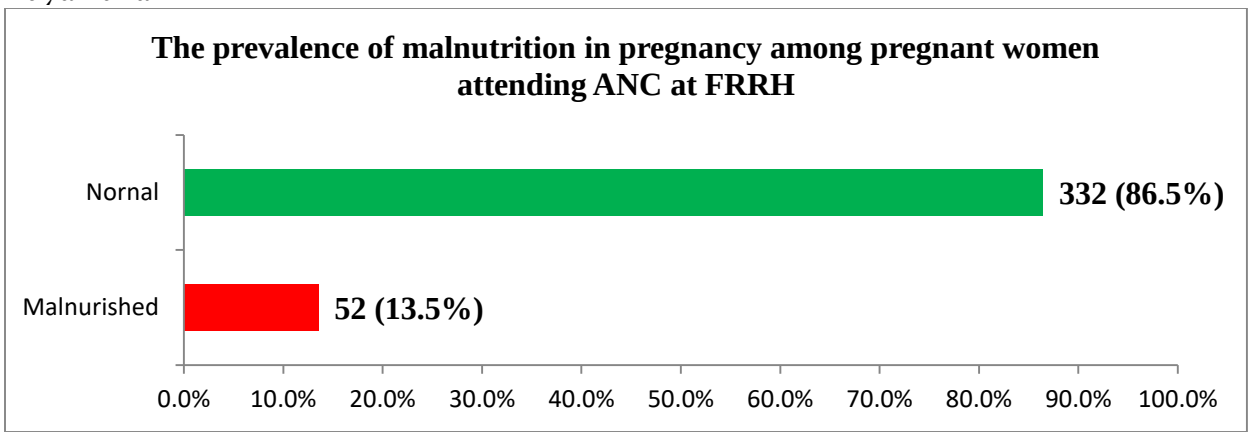

Figure 1: prevalence of malnutrition

Of the 384 the pregnant women attending ANC at FRRH who participated in this study, 52(13.5%) were found to be malnourished. Therefore, the prevalence of malnutrition among the pregnant women attending ANC at FRRH was 13.5%.

Table 3: socio-demographic factors contributing to malnutrition among pregnant women attending ANC at FRRH

Effect	Model Fitting Criteria	Likelihood Ratio Tests		
	-2 Log Likelihood of Reduced Model	Chi-Square	df	Sig.
Intercept	24.500[a]	0	0	.
Age	33.112	12.312	1	0.022
Place of residence	28.542	4.032	1	0.258
Marital status	34.673	16.585	1	0.012
Education level	36.239	26.439	1	0.001
Occupation	30.523	9.873	1	0.041
Income level	31.621	21.168	1	0.006

From the table above, regarding the age of the respondent, significance level (p=0.022<0.05) meant that age had a significant contribution to malnutrition among pregnant women attending ANC at FRRH.

For the place of residence, significance level (p=0.258>0.05) meant that the respondent's place of residence did not significantly contribute to malnutrition among pregnant women attending ANC at FRRH.

For the respondent's marital status, significance level (p=0.012>0.05) meant that the marital status significantly contributed to malnutrition among pregnant women attending ANC at FRRH.

For education level, significance level (p=0.001<0.05) implied that the mother's education level significantly contributed to malnutrition among pregnant women attending ANC at FRRH.

On respondent's occupation, significance level (p=0.041>0.05) meant that the respondent's occupation significantly

contributed to malnutrition among pregnant women attending ANC at FRRH.

Finally on respondent's income level, significance level (p=0.006>0.05) meant that the respondent's income level significantly contributed to malnutrition among pregnant women attending ANC at FRRH.

Table 4: individual related factors contributing to malnutrition among pregnant women attending ANC at FRRH

Variable	<22.0cm (malnourished)		>-22.0 cm (Normal)		Chi-square	Df	Sig.
	Freq (n=52)	%	Freq (n=332)	%			
Knowledge about malnutrition							
Yes	52	13.5	332	86.5	26.023	1	0.000
No	0	0.0	0	0.0			
Frequency of ANC attendances							
1-2 times	15	3.9	112	29.2	1.135	1	0.769
3-4 times	28	7.3	157	40.9			
4+ times	9	2.3	63	16.4			
HIV status							
Positive	7	1.8	5	1.3	9.672	1	0.021
Negative	45	11.7	327	85.2			
Number of children							
Less than 2	17	4.4	122	31.8	18.443	1	0.001
3-4	22	5.7	174	45.3			
5+	13	3.4	36	9.4			
Number of people on a household							
1-3 people	7	1.8	77	20.1	14.011	1	0.002
4-6 people	30	7.8	153	39.8			
7+ people	15	3.9	102	26.6			

Statistically significant at 95% Confidence Interval
Source: Primary data, 2020

From the results in the table above, on the knowledge of the respondents, women's knowledge about nutrition had a significant (p=0.000<0.05) contribution on malnutrition among pregnant women attending ANC at FRRH. In this study, all the pregnant women who were attending ANC at FRRH had knowledge about nutrition since they always health educated during their ANC visits.

On the frequency of ANC visits, frequency of ANC visits did not significantly (p=0.0769>0.05) contributed to the malnutrition among pregnant women attending ANC at FRRH. The study also revealed that the prevalence of malnutrition was high among women who had attended 3-4times (7.3%); 3.9% in women who had attended 1-3times and the least (2.3%) in women who had attended more than 4times. Therefore, pregnant women who had attended ANC more than 4times were less likely to be malnourished as compared to those who had attended less times.

On the HIV status of the respondents, the study revealed that the HIV status had a significant (p=0.021<0.05) contribution on malnutrition among pregnant women attending ANC at FRRH. In this study, most of the HIV positive pregnant women (7/12) were malnourished.

On the number of children, the findings in this study showed that the number of children bared by the pregnant women attending ANC at FRRH significantly (0.001<0.05) contributed to the malnutrition among pregnant women attending ANC at FRRH. However, the prevalence of malnutrition was high among pregnant women who had 3-4 children (5.7%).

Finally, the number of people in the household significantly (0.002<0.05) contributed to the malnutrition among pregnant women attending ANC at FRRH. And, the prevalence of malnutrition was high in women who came from households of more than 3people because there was always competition from food and most likely small income share for each family member.

DISCUSSION

The researcher found out that of the 384 the pregnant women attending ANC at FRRH who participated in this study, 52/384 (13.5%) were found to be malnourished. In this context therefore, the prevalence of malnutrition among the pregnant women who were attending ANC at FRRH was 13.5%. The study further assessed the extent of malnutrition and established that 47(12.2%) were moderate acute malnutrition and 5(1.3%) were severe acute malnutrition. The prevalence of malnutrition among the pregnant women in FRRH was also found out to be lower than that of In Bangladesh, India were three selected villages of Sirajganj, Kishoreganj and Tangail districts were across section study was conducted where 56 pregnant and 46 postpartum women were recruited from community clinics by purposive sampling technique and found out that, of the 56 subjects studied a significant number of 24 (23.5%) of the pregnant women were found to be malnourished [61].

The study also found out that marital status that significantly level (p=0.012>0.05) meant contributed to malnutrition among pregnant women attending ANC at FRRH. In that married women are less likely to be malnourished because most husbands take care of them during pregnancy which is the case for a low (13.5%) malnutrition prevalence among pregnant women attending ANC at FRRH since 97.4% of them were married. This can be due to the fact that married women are in a better position to get emotional, physical and economic support from their husbands. Women without a partner usually tend to have greater financial difficulties. The low socioeconomic status of the women may have a significant impact on their nutritional status and health seeking behavior.

The study findings also revealed that education level significantly (p=0.001<0.05) contributed to malnutrition among pregnant women attending ANC at FRRH. The findings of this study were in agreement with Melku et al [62] who revealed that education of women has been associated with nutrition status during pregnancy and further found out that secondary or higher education are less likely to experience malnutrition compared to their counterparts with lower level of education. Education has been reported to reduce the risk of being malnourished in several studies.

The researcher also found out that occupation significantly (p=0.041>0.05) contributed to malnutrition among pregnant women attending ANC at FRRH. In this context, the formally employed and business women were less likely to be malnourished than the housewives and informally employed pregnant women because they were exposed to nutrition knowledge and having sustainable income to eat balance diet.

CONCLUSION

The purpose of the study was to examine the prevalence and the contributing factors of malnutrition in pregnancy among pregnant women attending ANC at FRRH. It established that of the 384 the pregnant women attending ANC at FRRH

who participated in this study, 52/384 (13.5%) were found to be malnourished; furthermore, 47(12.2%) were moderate acute malnutrition and finally, 5(1.3%) were severe acute malnutrition. On the demographic factors; the study found out that age, the marital status, education level, occupation and income level of the mother significantly contributed to malnutrition among pregnant women attending ANC at FRRH. Finally, on the individual related factors, knowledge about nutrition, HIV status, the number of children and the number of people in the household of the mother significantly contributed to malnutrition among pregnant women attending ANC at FRRH.

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