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Knowledge, Attitude, and Practices on Nutrition Status Among Pregnant Mothers Attending Maternal Child Health Clinic in Kakuma Sub-County Hospital

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ABSTRACT

Maternal undernutrition is a public health problem that requires more attention. Being aware of a diversified and nutritious diet is paramount to the overall health of a pregnant woman. This study aimed to assess knowledge, attitude, and practices on nutrition status among pregnant women attending maternal and child health clinics at Kakuma Sub-County Hospital, Turkana West. A facility-based cross-sectional study design was conducted among 186 participants who were selected using a systematic random sampling which consisted of questions on socio-demographic and socio-economic characteristics, knowledge, attitude, and practices on nutrition. Data analysis was done using Statistical Package for Social Sciences version 23. Binary logistic regression analysis was done to identify the associated factors. The findings were reported as crude odds ratio (COR). Statistical significance was considered using a p- value < 0.05 at a 95% confidence interval. The results from binary regression analysis indicated that the factors that were positively associated with maternal nutrition were minimum meal frequency (COR = 0.47, 95% CI: 0.23 - 0.97, p = 0.042), gestation (COR = 3.02, 95% CI: 1.38 - 6.62, p = 0.006), occupation (COR = 2.62, 95% CI: 1.30 - 5.28, p = 0.007), use of fruits and vegetables (COR = 0.34, 95% CI: 0.16 - 0.72, p = 0.005) and nutritional education (COR = 0.52, 95% CI: 0.286 - 0.93, p = 0.028). In addition to the maternal knowledge of nutrition, the study revealed that demographic traits such as occupation and gestation period were important predictors of the nutrition status of a mother during pregnancy. Therefore, targeted health education intervention should be considered for better nutritional outcomes among pregnant mothers.

Keywords: Nutritional status, pregnant mothers, undernutrition

1. BACKGROUND

Maternal nutrition is a significant predictor which determines the health of the expectant mother and the baby (Ranale et al., 2024). A pregnant woman requires elevated nutrients throughout the pregnancy cycle since they undergo biochemical and physiological changes (Tilahun et al., 2021). Therefore, they should eat a variety of balanced diet foods that are rich in proteins, vitamins, energy, and minerals (Olimba et al., 2017). Despite this, the majority of expectant mothers in low and middle-income countries still face challenges in nutrient intake which exacerbates maternal nutrition risks during pregnancy and birth, and significantly contributes to neonatal complications (Demilew et al., 2020; Tilahun et al., 2021). One of the major contributing factors in Sub-Saharan Africa is utilization of diets that are mostly cereal-based with little or no vegetables and fruits, a phenomenon commonly found among those living in rural and low resourced areas (Kachoria et al., 2022).

Maternal undernutrition is highly prevalent with nearly 50% of the world's population experiencing it and thereby contributing to about 3.5 million deaths annually (Armini et al., 2020). Globally, an estimated 7% of these deaths occurs as a result of malnutrition disease burden which causes poor pregnancy outcomes among expectant mothers (Armini et al., 2020). A survey in Ethiopia revealed that more than 20% of women of reproductive age were malnourished and estimated that more than 28% were anemic (Woldu et al., 2020). This was similar to a study in the same region that reported undernutrition among antenatal women at 22.6% and poor nutritional practice of expectant women at 50.4% and thereby endangers the life of the mother and the fetus (Diddana, 2019). A similar trend was observed in Kenya where a community based survey on nutritional status of women established a 14% undernutrition, with about a quarter of them being pregnant and lactating women (UNICEF, 2020). Similarly, high worldwide prevalence of anemia among women of reproductive age was recently reported as 38.2%, while in most regions prevalence of anemia among pregnant mothers was found to be 39.3% (Christian et al., 2022).

Recent reports indicate that pregnancy remains an important contributor to the burden of disease and death among mothers and children, especially during delivery (Aoyama et al., 2022). In low and middle-income countries, 3.1 million children die at their neonate stage of birth, caused by low birth weight, and severe infections (Rosa-Mangeret et al., 2022). Yearly, 15 million births are preterm, of which 1.1 million hardly survive the neonatal period (Huang et al., 2018; Lawn et al., 2022), and about one-fifth million are born with low birth weight, only 5% of these births take place in developed countries (Tsegaye et al., 2020). Many of those who survive suffer a permanent disability, and chronic conditions

(UNICEF, 2020; Ziqubu, 2019). Additionally, about 287 000 women were reported to have died due to pregnancy and childbirth complications as a result of maternal health consequences (Ziqubu, 2019). Studies observed that the leading contributing factor to these challenges is the pregnant mothers limited knowledge on nutrient intake (Anino et al., 2018; Anino et al., 2015). Additionally, poor feeding and nutritional practices were reported to contribute to anemia prevalence (Atif & Khalifa, 2021, Mafuko).

A range of factors have been identified to contribute to maternal nutrition including socio-demographic characteristics, knowledge, attitude, and practices of expectant mothers toward nutrition (Ramadhani et al., 2021; Strömmer et al., 2021). In Turkana both blanket and targeted nutritional specific interventions on pregnant mothers have been rolled out to curb undernutrition. However, given the consistently high levels of undernutrition among women in Turkana amidst these interventions there is need to assess the knowledge, attitudes, and practices of pregnant mothers on nutrition status.

2. METHODOLOGY

2.1 Study Design

A facility-based cross-sectional study design was conducted to assess the knowledge, attitude, and practices on nutrition status among pregnant women attending maternal and child health clinic at Kakuma Sub-County hospital, in Turkana West Sub-County, Turkana County, Kenya. Turkana County is a county in the former Rift Valley province of Kenya. Turkana County borders Uganda to the West; South Sudan and Ethiopia to the North and North-East respectively. To the South and East, the neighboring counties are West Pokot, Baringo, and Samburu Counties while Marsabit County is located on the eastern shore of Lake Turkana. The inclusion criteria used in our study were to include all expectant mothers aged 15-49 years attending the MCH clinic at Kakuma Hospital.

2.2 Sample size & Sampling Technique

A sample size of 169 mothers was calculated using Fischer's formula. Based on the desired sample size, systematic random sampling was used to select all expectant mothers attending maternal and child health clinics giving each an equal opportunity for selection. A sampling frame of all pregnant mothers attending the maternal and child health clinic at Kakuma Sub-County hospital was divided by the desired sample size, which gave a sampling interval of two. Using the sampling frame, a random number generator was used to determine the starting point, and the pregnant mothers were chosen based on the sampling criteria until the desired sample was reached during the data collection period.

2.3 Data Collection

Primary data was collected using structured questionnaires. Data collection was carried out from 3rd June to 3rd July 2023. The questionnaire used to collect data was validated using a team of experts from the Public Health Department of the University of Kabianga. The developed questionnaire was translated into the local language (Ngaturkana) before data collection. A pre-test was performed on 5% of the total desired sample at Kakuma Mission Hospital. Nutritional assessment was carried out using mid upper arm circumference (MUAC) based on Center for Disease (CDC) procedures.

2.4 Ethical Consideration

The researcher sought the autonomy and consent of the participants by recruiting only participants who had attained the age of 18 years and who had consented after reading and filling in a consent form. The anonymization of the data was done based on the Helsinki principle to protect the participants' confidentiality and privacy. The study was approved by the University of Kabianga Institutional Research Ethics Committee with the approval code ISERC/2023/0006.

3. RESULTS

3.1 Non-response rate

All the sampled participants accepted the invitation to participate in the study. Therefore, the study attained a 100% response rate.

3.2 Socio-demographic characteristics

The study's findings revealed that the majority of the participants (n = 100, 53.8%) were aged 16-26 years and had a gestation of 7 to 9 months (n=78, 41.9%) as shown in Table 1. About a third of the participants had no formal education and were mostly Catholics (n=77, 41.4%) and protestants (36.0%) as well as of Turkana ethnic origin (n=135, 72.5%). About half of the participants were married and had income below Ksh. 25,000 (n=94, 50.5% and n=94, 50.5% respectively). Additionally, slightly over two third of the participants had businesses.

Table 1: Socio-demographic characteristics

Variable	N	%	*P*-value
Age			0.814
16-26 years	100	53.8	
27-37 years	67	36.0	
38-48 years	19	10.2	
Gestation			0.019
0-3 Months	45	24.2	
4-6 Months	63	33.9	
7-9 Months	78	41.9	
Education			0.251
None	63	33.9	
Primary	46	24.7	
Secondary	54	29.0	
Tertiary	23	12.4	
Religion			0.873
Muslim	37	19.9	
Catholic	77	41.4	
Protestant	67	36.0	
Others	5	2.7	
Ethnic			0.507
Somali	39	21.0	
Turkana	135	72.5	
Others	12	6.5	
Marital Status			0.229
Single	64	34.4	
Married	94	50.5	
Divorced	28	15.1	
Occupation			0.008
Pastoralist	49	26.3	
Business	125	67.2	

Farming	7	3.8	
Others	5	2.7	
Monthly income			0.064
0-25000	94	50.5	
26000-50000	59	31.7	
More than 51000	33	17.7	

3.3 Nutritional status of pregnant mothers

The study's findings showed that about half of the participants were underweight (n = 101, 54.30%) as presented in Figure 1. Less than half of the participants had normal MUAC scores (n = 85, 45.70%).

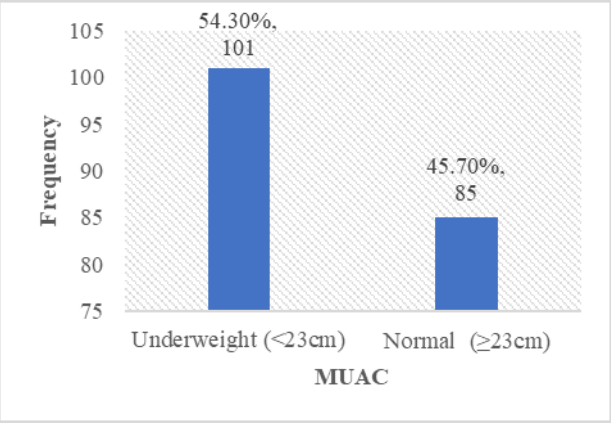

Figure 1: Nutritional Status of pregnant mothers MUAC

3.4 Knowledge on nutrition

In terms of nutritional knowledge, participants who were aware of a balanced diet were (n=80, 43.0%) while those who ate balanced diet were (n = 87, 46.8%) as shown in Table 2. Additionally, 62 (33.3%) were aware of malnutrition risks and 37 (19.9%) identified low birth weight as the leading risk of malnutrition respectively. Less than half of the participants received nutrition education during pregnancy (n=80, 43.0%) with nutritionists being the leading health promoters (n =36, 19.4%). In this study, 35 (18.8%) of the participants were aware of nutrition during pregnancy, while the remaining 151 (81.2%) were not.

Table 2: Nutritional knowledge

Variable	**N**	**%**	***P*-value**
Mother & baby ate a balanced diet during pregnancy			0.211
Yes	87	46.8	
No	99	53.2	
Awareness of a balanced diet during pregnancy			0.187
Yes	80	43.0	
No	106	57.0	
Aware of malnutrition risks			0.053
Yes	62	33.3	
No	124	66.7	
Malnutrition risks during pregnancy			0.296
Diarrhea	3	1.6	
Low birth weight	37	19.9	
Don't know	22	11.8	
Received nutritional education during pregnancy			0.027
Yes	80	43.0	
No	106	57.0	
Healthcare providers responsible for health education during pregnancy			0.796
Nutritionists	36	19.4	
Community Health Assistant	13	7.0	
Others	31	16.6	
Awareness on nutrition during pregnancy			0.131
Aware	35	18.8	
Not aware	151	81.2	

3.5. Attitude towards nutrition

Concerning attitude toward maternal nutrition, the majority of the pregnant mothers preferred eating a balanced diet (n = 116, 62.4%) as shown in Table 3. However, 150 (80.6%) did not like vegetables and fruits. Nevertheless, they preferred eating excess food (n = 133, 71.5%) but not foods high on protein (n = 144, 77.4%).

Table 3: Preference of caregivers toward maternal nutrition

Variable	**N**	**%**	***p*-value**
Eating balanced diet			0.130
Agree	116	62.4	
Disagree	70	37.6	
Vegetables andfruits			0.564
Agree	36	19.4	
Disagree	150	80.6	
Eating excess food during pregnancy			0.294
Agree	133	71.5	
Disagree	53	28.5	
Eating foods with high protein content			0.017
Agree	42	22.6	
Disagree	144	77.4	

3.6 Practices related to nutrition, ANC, and Culture

Table 4 shows the results of nutritional practices among pregnant mothers. The findings indicated that 59 (31.7%) followed nutritional advice. Additionally, more than two-thirds of the participants consumed fruits and vegetables (n=144,77.4%). However, the majority of them ate fruits and vegetables only once a week (n=59, 31.7%) with only 38 (20.4%) attaining the minimum meal frequency. The findings further showed that 58 (31.2%) of the participants visited the antenatal clinic twice. About culture, 66 (35.5%) of the participants noted that some foods were prohibited based on their culture. The most prohibited foods were eggs (n = 23, 12.4%) and avocados (n = 12, 6.5%).

Table 4: Nutritional practices among pregnant mothers

Variable	N (186)	%	*P*-value
Adherence to advice on nutrition			0.519
Yes	59	31.7	
No	127	68.3	
Fruit and vegetable consumption			0.004
Yes	144	77.4	
No	42	22.6	
Frequency of consumption			0.316
Daily	49	26.3	
Once a week	59	31.7	
Twice a week	36	19.4	
Minimum meal frequency			0.040
Yes	38	20.4	
No	148	79.6	
Antenatal Clinic visits			0.060
1	46	24.7	
2	58	31.2	
3	52	28.0	
≥ 4	30	16.1	
Cultural prohibition of some foods			0.331
Yes	66	35.5	
No	120	64.5	
Foods prohibited			0.538
Eggs	23	12.4	
Goat meat & unboiled	5	2.7	
Rice	2	1.1	
Meat	9	4.8	
Pineapple	5	2.7	
Goats/cold water	5	2.7	
Avocados	12	6.5	
Cold drink	9	4.8	

3.7. Predictors of nutritional status

The findings for crude odds ratio (COR) showed that minimum meal frequency, gestation, occupation, utilization of fruits and vegetables, and nutrition education during pregnancy were statistically associated with the nutritional status of pregnant mothers as shown in Table 5. Consumption of fewer meals than recommended was associated with a reduced likelihood of being underweight among expectant mothers (COR = 0.47, 95% CI: 0.23 -0.97, p= 0.042). Being in the third trimester of the pregnancy and engaging in business was associated with a higher likelihood of being underweight (COR = 3.02, 95% CI: 1.38 - 6.62, p = 0.006) and (COR = 2.62, 95% CI: 1.30 - 5.28, p = 0.007) respectively. Those who did not receive nutrition education during pregnancy, and those who did not utilize fruits and vegetables had a lower likelihood of being underweight (COR = 0.52, 95% CI: 0.286 - 0.93, p = 0.028) and (COR = 0.34, 95% CI: 0.16 - 0.72, P = 0.005) respectively. Similarly, for the adjusted odds ratio (AOR), the study showed that being in the third trimester of the pregnancy and engaging in business was associated with a higher probability of being underweight (AOR = 2.78, 95% CI: 1.18 - 6.52, p = 0.019) and (AOR = 2.181, 95% CI: 1.02 - 4.66, p = 0.044) respectively

Table 5: Regression analysis of maternal nutritional status, knowledge and attitude

Variable	UnderweightN(%)	NormalN (%)	COR	*P*-value	AOR*	*P*-value
Knowledge						
Aware	15 (8.1)	20(10.8)	1		1	
Not aware	86 (46.2)	65(34.9)	0.57(0.27-1.19)	0.134	0.61(0.28-1.33)	0.214
Attitude						
Positive	61 (32.8)	58(31.2)	1		1	
Negative	40 (21.5)	27(14.5)	0.71(0.39-1.30)	0.268	0.79(0.42-1.49)	0.468
Minimummeal frequency						
Yes	15(8.1)	86(46.2)	1		1	
No	23(12.4)	62(33.3)	0.47(0.23-0.97)	0.042	0.49(0.220-1.104)	0.086
Gestation						
1st	32(17.2)	13(7.0)	1		1	
2nd	34(18.3)	29(15.6)	2.10(0.93-4.73)	0.074	1.70 (0.71 -4.06)	0.235
3rd	35(18.8)	43(23.1)	3.02(1.38-6.62)	0.006	2.78 (1.18-6.52)	0.019
Occupation						
Pastoralist	34(18.3)	15(8.1)	1		1	
Business	58(31.2)	67(36.0)	2.62 (1.30 -5.28)	0.007	2.181(1.02-4.66)	0.044
Farming	4(2.2)	3(1.6)	1.70(0.34 -8.55)	0.520	1.314(0.22-7.74)	0.763
Others	5(2.7)	-	-	-		
Use fruits and vegetables						
Yes	70(37.6)	74(39.8)	1		1	
No	31(16.7)	11(5.9)	0.34 (0.16 -0.72)	0.005	0.538(0.23-1.25)	0.151
Nutritional education						
Yes	36(19.4)	44(23.7)	1		1	
No	65(34.9)	41(22.0)	0.52 (0.286-0.93)	0.028	0.53 (0.28 -1.01)	0.052
Eating foods highin protein						
Agree	18(9.7)	18(9.7)	1		1	
Disagree	83(44.6)	67(36.0)	0.81 (0.39-1.67)	0.564	1.22 (0.54-2.71)	0.635

*The model was adjusted for all the variables in the table, - no value

4. DISCUSSION

In this study, we found high underweight among the expectant mothers. These results compare well with those in the literature. For instance, studies conducted in Ethiopia reported 39.2% and 47.9% prevalence of underweight among expectant mothers (Fite et al., 2023; Tafara et al., 2023). However, our results disagreed with those reported by Dadi et al. and Martin et al. which found a much lower prevalence among pregnant women (Dadi et al., 2019; Martin et al., 2021). In our study underweight was measured using MUAC while in the latter study, BMI was used. It is reported by the same study that BMI is not a good indicator for measuring underweight among pregnant women since the BMI indicator computes weight and height to establish the BMI score. However, it is well known that during pregnancy mothers generally gain weight, therefore, as reported by an earlier study, the BMI indicator could mask the actual nutritional status during pregnancy (Takeda et al., 2024).

We found that gestation was associated with nutritional status among expectant mothers as the risk was higher among those in the first trimester as compared to their counterparts. The results were similar to those reported in Ghana revealing that there was a statistically higher likelihood of quality nutritional practices with AOR = 1.89 among mothers in their first trimester of pregnancy (Bukari et al., 2021). Additionally, pregnant mothers who received nutritional education during pregnancy were more likely to have a higher intake of fruits and vegetables. Another study conducted in low resourced settings found that pregnant women who received counseling had better nutritional status in terms of dietary practices diversity (Oumer et al., 2022). Their findings are consistent with our results. However, receiving nutrition education was positively associated with the nutritional status of pregnant adolescents (Tesfaye et al., 2024). In addition, those who consumed dark leafy vegetables had significantly high diversity score of nutrients during pregnancy (p = 0.031) (Twum-Dei et al., 2024).

In our study, occupation was associated with the nutritional status of pregnant mothers which significantly contributed to the minimum meal frequency eaten by pregnant mothers. The level of minimum meal frequency in this study are contrary to those reported by a study done elsewhere (Kassahun et al., 2023). This disparity could be attributed to geographical location differences that affects food availability and socioeconomic status such as occupation (Fekadu et al., 2024). Though our findings agreed with those of Tesfaye et al. (2024), they measured occupation based on principal component analysis which was used to determine household wealth by considering factors such as water supply, household possession, and animals kept by pregnant women, which was not the case in our study.

5. CONCLUSION

In conclusion, our study found that the majority of the participants had low level of knowledge but their attitude toward maternal nutrition was promising. Gestation, occupation, and nutritional education were the significant factors affecting maternal nutrition of expectant mothers. However, minimum meal frequency, occupation, gestation, nutritional education, and the use of fruits and vegetables were significant predicting factors for maternal nutritional practices during pregnancy.

6. RECOMMENDATION

There is a need for health education to improve the knowledge levels of the mothers on nutritional intake during pregnancy. The authors further recommend a study that quantifies the actual influence of health education on the nutritional intake of mothers during pregnancy.

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