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Original Research

Attending Antenatal Care in Yangon Worker's Hospital

Pengetahuan dan Praktik Gizi di Kalangan Wanita Hamil Yang Menghadiri Perawatan Antenatal di Rumah Sakit Pekerja Yangon

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Abstract:
Pregnancy is a critical period during which women's nutrition knowledge and practices can affect the health and nutrition status of both mother and child. This study aimed to assess the nutrition knowledge, practices and factors associated with nutrition practices among pregnant women attending antenatal care at Yangon Worker's Hospital, in Tamwe Township, Yangon Region, Myanmar. A cross-sectional study was conducted from August to December 2025 using a face-to-face interview method with structured questionnaires. The study included 169[Q1.1][u1.2] pregnant women of aged 20 to 45 years. The majority of participants (86.4%) were aged 35 years or younger. In terms of educational attainment, the largest proportion (36.1%) had completed middle school education, while the remaining participants had either primary or high school education. A small fraction of participants (1.2%) illiterate. More than half of the participants (53.3%) were in their first pregnancy, and (89.3%) were in the third trimester. The total nutrition knowledge scores were 33 and the median score (IQR) of participants was 10 (4). A total (65.7%) of the participants had good nutrition practices. Nutrition knowledge scores and ethnicity were significantly associated with nutrition practices; (AOR = 1.24, 95% CI: 1.04–1.37), and (AOR = 3.46, 95% CI: 1.12–10.67). This study highlighted the needs in nutrition education, particularly in awareness about the importance of micronutrients and culturally sensitive counseling to address food taboos for promoting healthy dietary practices and reducing preventable complications during pregnancy.

Key word: *Myanmar, Nutrition knowledge, Practices, Pregnant women*

1. INTRODUCTION

Nutrition plays a crucial role in pregnancy period, as both under and over nutrition are strongly linked to adverse pregnancy outcomes. Nutritional knowledge and practices are crucial for healthy eating, improving diet quality they consumed, and strengthening nutritional status. Improved knowledge on diet can help women adopt healthier diets, reduce the risks of both under and over nutrition, and contribute to better outcomes for mothers and children (1). Pregnant women are especially vulnerable because their nutrition requirements are higher, increasing the risk of maternal and child complications and susceptibility to infections. Many pregnant women have difficulty eating a proper diet, who can face stress in eating healthy foods because of different background factors (2,3). Most countries in the world are facing multiple and overlapping burdens of malnutrition. Women of reproductive age, especially pregnant women, in low- and middle-income countries are at risk of several micronutrient deficiencies, such as iron, folic acid, iodine, zinc, vitamins A and D, riboflavin, B6 and

B12, which could adversely affect the mother and pregnancy outcome (4,5). Malnutrition is ranked as one of the major causes of maternal mortality and is a significant factor in pregnancy outcomes (6). Several studies have shown that poor maternal nutrition status can lead to problems such as fetal growth failure, low birth weight, preterm birth, prenatal and infant mortality and morbidity. Therefore, it is important to have proper nutrition during pregnancy for the health of the mother and the child (7).

Anemia is another common problem during pregnancy. Pregnancy increases the body's need for nutrients, especially iron. Anemia can lead to serious health problems such as maternal illness, preterm birth, low birth weight, and poor fetal growth and development. It is more common in low-income countries like Myanmar. Therefore, it is important for pregnant women to know about eating iron-rich foods, taking supplements, and understanding the consequences of anemia during pregnancy (8). This study will explore the nutrition knowledge and practices in pregnant women who were attended in antenatal clinic of Yangon Workers' Hospital. Understanding pregnant women's nutrition knowledge and practices help in planning strategies to improve maternal nutrition and pregnancy outcomes, which can also reduce maternal and infant mortality.

2. METHODS

This study was a cross-sectional study and the study period was from August to December 2025. This study was conducted among the pregnant women attended the Antenatal Care clinic of Yangon Worker's Hospital, Tamwe Township, in Yangon Region of Myanmar. The total sample size was 165 pregnant women, calculated using the one population proportion formula with a 95% confidence interval (z = 1.96) and a 20% non-response rate. Consecutive sampling was applied to obtain the required sample size within a three-week data collection period.

Data was collected by face-to-face interviews with structured questionnaires. The questionnaire was pre-tested with 20 pregnant women attended the AN clinic of Central Women's Hospital in Yangon before data collection. The questionnaire included four sections; (1) socio-demographic characteristics of pregnant women, (2) obstetric characteristics (3) nutrition knowledge, and (4) nutrition practices questions. Nutrition knowledge and practices questionnaires were adopted from local literature (2) and DDS nutrition assessment questions by FAO (9,10).The total nutrition knowledge score was 33 and was assessed using 14 questions. The questions were open-ended and also included "yes, no, don't know" items, and scores were given based on the participants' responses. The knowledge scores were analyzed as continuous variables, as the overall scores fell below the 60% Bloom's cutoff and could not be reliably categorized into "poor" or "good." Therefore, they were deemed unsuitable for bivariate analysis (11). Nutrition practices of pregnant women were assessed using a structured questionnaire consisting of 19 items. The first 10 questions evaluated the frequency of consumption of major food groups during the previous week. For each food group, a score of 2 was assigned if the food was consumed for more than four days per week, score 1 if consumed for one to four days per week, and 0 if not consumed at all. The rest questions assessed additional dietary practices. Responses were scored as 1 for good practices and 0 for poor practices. The maximum possible nutrition practices score was 26, and scores were categorized based on the median: good nutrition practices (≥16) and poor nutrition practices (<16). The data was cleaned, coded, and analyzed by using SPSS (version 16.0). The descriptive analysis was conducted for

categorical variables using frequencies and percentages, and the results were presented using tables and a graph. For continuous variables, the median and interquartile range (IQR) was used. For the inferential analysis, bivariate analysis was done by Chi-square or Fisher's exact test and Mann-Whitney U test as appropriate to identify significant associations between categorical or continuous variables and nutrition practices. For the multivariate analysis, variables that show an association with good nutrition practices at $p<0.2$ in the univariate analysis were included in the multiple logistic regression model. Multiple logistic regression assumptions (multicollinearity, model fitness assumption and influential observation) were checked. There was no multicollinearity among independent variables (VIF<10) and there was no influential observation (Cook's distance<1). Model fitness was checked by Hosmer and Lemeshow test ($p= 0.201$). The results were presented in terms of odds ratios (OR) with 95% confidence intervals (CI), and a significance level of $p<0.05$ was applied to identify statistically significant.

The study protocol was submitted to the Academic Board, University of Public Health, Yangon and ethical approval was obtained from Institutional Review Board of University of Public Health, Yangon with the approval number, UPH-IRB (2025/MPH/10). Permission from the responsible persons were also obtained before conducting the study.

3. RESULTS

The study included 169 pregnant women attending antenatal care (AN care) at Yangon Worker's Hospital. The participant's age ranged from 20 to 45 years with median (IQR) of 29(8) years. Most of them belonged to the Bamar ethnicity (89.3%), and nearly all were Buddhist (99.4%). The majority had attained middle school education 36.1%, high school 27.8% and primary school 24.3%. All participants were workers and the majority (94.7%), were employed in the private sector (factories workers, business employee).

Table 1. Socio-demographic characteristics of pregnant women

Socio-demographic characteristics	Frequency	Percent
Age		
20-25 yrs	43	25.4
26-30 yrs	62	36.7
31-35 yrs	41	24.3
36-40 yrs	20	11.8
>40 yrs	3	1.8
Ethnicity		
Bamar	151	89.3
Others	18	10.7
Religion		
Buddhist	168	99.4
Christian	1	0.6
Education level		
Illiterate	2	1.2
Read and write	3	1.8
Primary level	41	24.3
Middle school level	61	36.1
High school level	47	27.8

Socio-demographic characteristics	Frequency	Percent
University/ graduate and above	15	8.9
Occupation		
Government employee	9	5.3
Private/business employee	160	94.7
Marital status		
Living with Spouses	164	97.0
Separated / Divorced	5	3.0
Husband's Education level (n=164)		
Illiterate	1	0.6
Read and write	2	1.2
Primary school level	18	11.0
Middle school level	63	38.4
High school level	68	41.5
University/ graduate and above	12	7.3
Husband's Occupation (n=164)		
Dependent	3	1.8
Government staff	5	3.1
Private/business employee	105	64.0
Own business	19	11.6
Manual laborer	29	17.7
Others	3	1.8
The person who cooks mainly for the whole family		
Herself	81	47.9
Mother	39	23.1
Mother- in law	19	11.2
Others	30	17.8
Monthly family income per person (MMK)		
≤ 2.2 Lakh	56	33.1
>2.2 – 3.3 Lakh	59	34.9
>3.3 Lakh	54	32.0

MKK= Myanmar Kyats

The obstetric characteristics of the study population are presented in Table 2. The majority of the pregnant women were primigravida and in their third trimester. Most participants had attended four or more antenatal care visits. Only 26.6% of the women reported experiencing any complaints during their pregnancy period.

Table 2. Obstetric Characteristics of pregnant women

Variables	Frequency	Percent
Gravida		
First pregnancy	90	53.3
G2 to G3	75	44.4
Above G3	4	2.4
Parity (n=79)		
P 0	12	15.2
P 1-2	65	82.3
P3	2	2.5
Gestational week		
First trimester (≤13 weeks)	6	3.6
Second trimester (14 to 26 weeks)	12	7.1

Variables	Frequency	Percent
Third trimester (≥ 26 weeks)	151	89.3
Bad Obstetric history (n=79)		
Yes	20	25.3
No history	59	74.7
Number of AN visit		
1 to 4 times	36	21.3
Over 4 times	133	78.7
Type of illness in current pregnancy †		
Diabetes mellitus	3	1.8
Pre-eclampsia	9	5.3
Hypertension	18	10.7
Morning sickness	114	67.5
No history	45	26.6
Current twin pregnancy		
Yes	2	1.2
No	167	98.8

Table 3 presents the distribution of knowledge regarding food groups among the respondents. Out of 169 participants, 35 (20.7%) were unable to correctly identify protein-rich foods, 107 (63.3%) did not know iron-rich foods, and all participants (169, 100%) were unable to correctly identify vitamin B1–rich foods. Furthermore, 154 (91.1%) of the pregnant mothers did not identify the consequences of iron-deficiency anaemia, and 132 (78%) were unable to describe the consequences of iodine deficiency.

Table 3. Knowledge distribution of food group and consequences

Knowledge on (multiple responses)	Frequency	Percent
Protein-rich foods		
Meat	128	75.7
Fish	88	52.1
Eggs	25	14.8
Beans and legumes	7	4.1
Milk and dairy products	6	3.6
Do not know	35	20.7
Iron-rich foods		
Green leafy vegetables	36	21.3
Beans and legumes	25	14.8
Organ meat	8	4.7
Red Meat	7	4.1
Do not know	107	63.3
Vitamin – A rich foods		
Green vegetables	15	8.9
Yellow and Red fruits	13	7.7
Eggs	2	1.2
Milk and dairy products	2	1.2
Do not know	137	81.1
Vitamin – B1 rich foods		
Do not know	169	100.0
Signs of undernutrition		
Lack of energy/weakness	43	25.4
Loss of weight/thinness	5	3.0
Easily get sick	4	2.4
Do not know	123	72.8
The consequences of iron-deficiency anaemia		

Growth retardation	11	6.5
Low birth-weight	4	2.4
Risk of dying	3	1.8
Do not know	154	91.1
The consequences of iodine deficiency		
Impaired brain development	21	12.4
Impaired physical development	21	12.4
Still birth	3	1.8
Low birth-weight	3	1.8
Preterm baby	2	1.2
Do not know	132	78.1

Figure 1. Nutrition knowledge among pregnant women

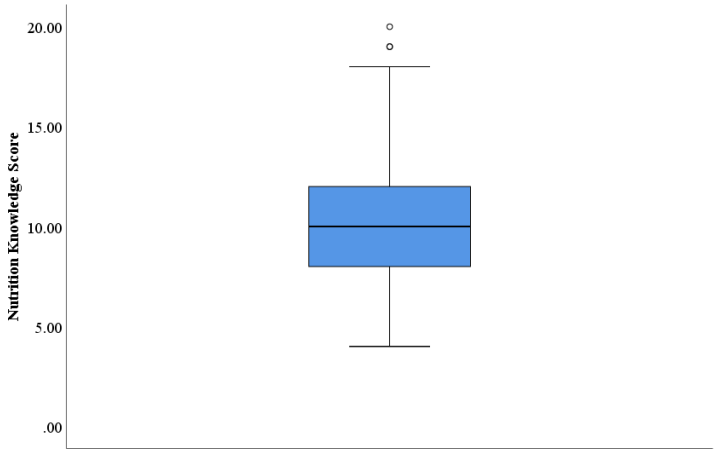


Figure 1 showed nutrition knowledge scores of pregnant mothers. Scores range from a minimum of 4 to a maximum of 20, reflecting variability in participants' knowledge. The median (IQR) score was 10 (4).

Table 4 shows eating practices of pregnant women according to food variety. The most frequently consumed foods among the participants were grains, roots, and tubers (mainly rice), with all women reporting intake on more than four days per week. Consumption of meat and meat products, fish and seafood, and eggs was generally minimally adequate, with the majority of women consuming these foods one to four days per week.

Table 4. Distribution of eating practices by food group among pregnant women

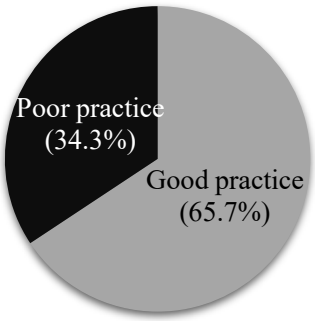
Food group	Not eat within a week n (%)	1-4 day per week n (%)	>4 days per week n (%)
Grain,Roots and Tuber	-	-	169 (100)
Meat, organ meat and meat products	2 (1.2)	140 (82.2)	27 (16.0)
Eggs	5 (3.0)	124 (73.4)	40 (23.7)
Fish and seafood	5 (3.0)	124 (73.4)	40 (23.7)
Milk and dairy products	21 (12.4)	102 (60.4)	46 (27.2)

Legumes and beans	31 (18.3)	125 (74.0)	13 (7.7)
Green leafy vegetables	4 (2.4)	69 (40.8)	96 (56.8)
Yellow and orange vegetable	40 (23.7)	116 (68.6)	13 (7.7)
Other vegetables	13 (7.7)	140 (82.8)	16 (9.5)
Fruits	17 (10.1)	125 (74.0)	27 (16.0)

For the nutrition practices (Figure 2), the total score ranged from a minimum of 10 to a maximum of 24. The median (IQR) score was 16 (3). Base on this, 34.3% of participants had poor nutritional practices, while 65.7% demonstrated good nutrition practices.

Among the background factors examined, receiving nutrition information was significantly associated with better nutrition practices (p = 0.012). Additionally, ethnicity was also found significantly associated with nutrition practices (p = 0.043). Most obstetric factors showed no statistically significant association with nutrition practices, except for pre-eclampsia. Pre-eclampsia was significantly associated with nutrition practices (p = 0.044). Women with pre-eclampsia were more likely to have poor dietary practices 66.7% compared to those without pre-eclampsia 32.5%. But the distribution of the knowledge score between pregnant women with good and poor nutrition practices was significantly different. In multivariable regression analysis of factors associated with nutrition practices, nutrition knowledge score and ethnicity were the only variables that were significantly associated with nutrition practices after adjusting for other variables. Nutrition knowledge was positively and statistically significantly associated with good nutrition practices. Specifically, for each one-point increase in the nutrition knowledge score, pregnant women were 1.24 times more likely to engage in good nutrition practices (AOR = 1.24, 95% CI: 1.04–1.37). Ethnicity also emerged as a significant predictor. Bamar pregnant women were found to be 3.46 times more likely to practice good nutrition compared to women from other ethnic groups (AOR = 3.46, 95% CI: 1.12–10.67).

Figure 2. Nutrition Practices of pregnant women



Tabel 5. Multivariable regression analysis of factors associated with nutrition practices

Variables	COR (95% CI)	AOR (95% CI)	p value
Nutrition knowledge score[#]	1.24 (1.09, 1.40)	1.19 (1.04, 1.37)	0.013*
Ethnicity			
Bamar	2.68 (0.99, 7.22)	3.46 (1.12, 10.67)	0.031*
Others	1	1	
Occupation			
Government employee	4.42 (0.54, 36.29)	1.70 (0.12, 23.47)	0.691
Private/business employee	1	1	
Education level			
Below and primary school	1	1	
Middle and High school	1.03 (0.50, 2.12)	0.95 (0.43, 2.11)	0.905
Graduated and above	3.81 (0.76, 18.95)	2.56 (0.31, 20.77)	0.377
Illness in current pregnancy			
Pre-eclampsia	1	1	
No pre-eclampsia	4.15 (0.99, 17.26)	0.26 (0.49, 1.37)	0.112
Gestational week			
First trimester	1	1	
Second trimester	5.50 (0.38,78.57)	7.02 (0.42,116.03)	0.173
Third trimester	0.87 (0.15,4.92)	1.25 (0.18,8.54)	0.816
Bad obstetric history			
Present	0.47 (0.19,1.22)	0.47 (0.16,1.30)	0.147
G1 or no bad obstetric history	1	1	
Receiving nutrition information			
Receiving	2.24 (1.16,4.35)	1.62 (0.77,3.39)	0.200
Not receiving	1	1	

4. DISCUSSION

The study population was predominantly under 35 years old, aligning with findings from Malaysia that suggest older age is associated with higher levels of nutrition knowledge (12). Most participants were of Bamar ethnicity and practiced Buddhism, reflecting the predominant ethnic and religious composition nationwide. Most participants had attained middle or high school education, while only a small proportion (10%) had completed university or higher education. This proportion is slightly lower than that reported in a local study (12.7%). This distribution may be due to the study setting, as it was conducted in a workers' hospital where most participants were factory workers, who typically do not require higher educational qualifications compared to government employees (2). In this study, most women attended more than four antenatal care (ANC) visits, which is substantially higher than in a local study. This finding indicates better utilization of ANC services among the participants, likely due to being primigravida, awareness of adverse pregnancy outcomes, free access to healthcare, and regular follow-up in the study setting. The study also found a knowledge gap in participants' understanding of key nutrient-rich foods. Although nearly eighty percent of participants were aware of protein-rich foods, this proportion was almost double that reported in Ethiopia. On the other hand, awareness of iron-deficiency anemia was very low, with 91.1% unable to identify it, compared with 58.1% in that study (13). Furthermore, none of the participants could identify vitamin B1-rich foods. These results highlight the need to strengthen antenatal nutrition education with

a focus on micronutrient awareness, appropriate dietary diversity, and misconceptions related to cultural food restrictions (14).

In the present study, the majority of participants demonstrated relatively good nutrition practices. These findings suggest that, although nutrition knowledge was low, some women may follow appropriate dietary behaviors through routine habits, family influence, or antenatal counseling, even in the presence of limited nutrition knowledge. However, the persistence of poor practices among a substantial proportion highlights the need for strengthened nutritional education during antenatal care. Regarding the factors associated with nutritional practices, pregnant women's nutrition knowledge scores were found to be significantly associated with their nutritional practices. as one-point increase in the knowledge score raises the likelihood of good nutritional practices by about 20%. This does not guarantee behavior change for an individual, but it indicates a positive trend: as knowledge improves, so does the probability of adopting better practices (15). This finding is consistent with the studies conducted in Southern Ethiopia and Gondar Town (North-West Ethiopia), as well as a local study, which reported that the number of antenatal care visits and nutritional knowledge were significant predictors of nutritional practices among pregnant women. This highlights the critical role of nutrition education and counseling during antenatal care in promoting healthy nutrition behaviors among pregnant women. Improved knowledge may enhance women's awareness of appropriate food choices, meal frequency, and the importance of nutrients during pregnancy. Another factor, ethnicity, was 3.4 times more likely to practice good nutrition. This finding may reflect differences in cultural beliefs, habitual food choices, and nutrition practices among ethnic groups. Cultural factors, including religion, traditional foods and customs, and ethnicity, were also important determinants of dietary behaviors (16).

5. CONCLUSION

This study revealed that most participants demonstrated limited knowledge of nutrient-rich foods, particularly regarding vitamins, minerals, and the consequences of deficiencies. Understanding of nutritional deficiencies was poor, with nearly three-quarters of participants unaware of their effects. More than half 54.4% had not received any nutrition education. Nutrition practices showed frequent consumption of grains, roots, and tubers (primarily rice), while intake of meat, fish, and eggs was generally limited to one to four days per week. Significant gaps were observed in the consumption of dairy, legumes, and fruits, with some women reporting no intake at all. Vegetable consumption varied: green leafy vegetables were eaten regularly, but yellow and orange vegetables had the highest rates of non-consumption. Despite these gaps, nearly all participants consumed foods from more than five of the ten food groups, indicating generally good nutrition practices. Nutrition knowledge and ethnicity emerged as significant predictors of nutrition practices. To improve maternal nutrition practices and health, nutrition education should be strengthened, including targeted programs for different ethnic groups.

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Conflict of Interest

The authors declare no conflict of interest.

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