



Evaluation Nutritional Statue of Pregnant Women at Primary Health Care in Baghdad City

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Article Information

Received: 3-4-2026

Accepted: 1-5-2026

Published: 1-7-2026

Abstract

Background: The nutritional needs of a mother are very important to the health of the mother and the fetus, as they affect the pregnancy process and postnatal development. Objectives of the research: The objective of this research is to assess the nutritional welfare of the pregnant women in the primary health care centers at Baghdad City and to determine the dietary consumption in reference to the recommended dietary allowances (RDA). **Methodology:** The research was a descriptive study, which was performed between the 1st of January and 13th of April 2023 in the Primary Health Care Centers of Baghdad and which included a purposive sample of 100 pregnant women. A self-administered questionnaire, including demographics, obstetric history, and nutritional status and knowledge, were used to collect the data. Reliability (Cronbachs Alpha = 0.78) was tested using a pilot study (n=20) and content validity was established by naming experts. The completion of questionnaires lasted between 10 and 15 minutes, the SPSS 24.0 was used to analyze the data on descriptive and inferential analysis. **Result:** The researchers discovered that majority of pregnant women were between the ages 20-29 (74.44), and more than half of them were of the preparatory level and above (52.63) and the majority were unemployed (83.46). The mean age at marriage was 22.2, first pregnancy 23.7 and mean pregnancies 1.8. Risks that came before the pregnancy were miscarriage (8.27%) and complications during birth (12.78%). Women who were underweight lost weight less than necessary ($p=0.000$), and obese women lost weight also less ($p=0.040$). The majority of them were over-nourished, protein and energy-wise, but calcium, folacin and vitamin A levels were low. **Conclusions:** The study found out that majority of pregnant women were well-nourished in terms of energy and protein and were deficient in calcium, folic acid, and vitamin A, which were probably caused by unbalanced diets, and had an impact on the maternal and fetal health and predisposed to complication risks.

Keywords : Pregnancy, Nutritional Status, BMI, Micronutrient Deficiency, Weight Gain, Maternal Health

Introduction:

The maternal nutrition is important in defining maternal and neonatal health outcomes. Nutritional status of pregnant women has been redefined in more than one occasion, which is multidimensional in nature. In one context, it can be defined as the delivery of the first-level health care services that deal with the needs of the mothers and in another one it can be defined as a complex of measures that are provided to vulnerable and low-income populations. In addition to its clinical aspect, maternal nutrition is tightly connected to other economic, social, and political aspects, thus, it is not merely a health problem, but also a social and political concern (Anyanwu et al., 2024; Wells et al., 2021).

Nutritional status can be best understood as an overall manner of health which takes into account the physical, psychological and social health of pregnant women. It is based on the idea of holistic care during pregnancy, which includes its prevention, counseling, treatment, and rehabilitation. It is important to make sure that the maternal nutrition is sufficient to minimize complications and ensure improved results of both the mothers and their children (Keats et al., 2021; Naaz & Muneshwar, 2023).

The maternal healthcare services are closely associated with the maternal nutritional status. Women perceptions of care timeliness, empathy, and communication define whether or not they are willing to use the services, adhere to treatment, and establish a continuity with their healthcare providers. Maternal satisfaction has hence become a predictive factor of healthcare use and now an inherent measure of quality and performance measurement in health systems (Ope et al., 2025; Lindbloom, 2022).

The Alma-Ata Declaration (1978) pointed out that essential health care should be universally accessible, affordable and socially acceptable. It emphasized maternal and child health, nutrition promotion, immunization, disease prevention, and access to essential medicines as the central activities to enhance the health of the community (Nadrian, 2024; Nabia et al., 2023). In this context, maternal nutrition is one of the pillars of sustainable health, which can be attained. Nonetheless, like barriers, the lack of proper supply of vaccines, distances to health centers, and a lack of awareness still obstructs successful service delivery (Izudi et al., 2017; Poston et al., 2013). In order to fill these gaps, national and local evaluation and improvement strategies should be undertaken. Evaluation of nutritional status of pregnant women is thus essential. It does not only offer baseline information to establish areas of weaknesses to the services but it is also used to design effective interventions that would see that women access the right care, at the right time, and by the right personnel. Moreover, the rural and urban populations are compared to show some differences that need strategies unique to the context (Nnamuchi & Ilodigwe, 2022; Adikari et al., 2016).

Considering these issues, the current research will assess the nutritional condition of pregnant women visiting primary healthcare centers. It also aims at testing socio-demographic factors, including age, education, occupation, and income, and obstetric history, including the age of marriage, parity, and the risk factors of pregnancy. Through the dimensions, the research aims at developing evidence that can be used in the formulation of policies, improvements on maternal care and eventually better maternal and child health outcomes (Mehta et al., 2021; Maheshwari et al., 2022)

With these issues in mind, the current research seeks to assess the nutritional conditions of pregnant mothers who visit primary healthcare centers. It also aims at studying socio-demographic factors including age, education, occupation and income and obstetric history including marriage age, parity, and pregnancy-related risk variables. By touching on these dimensions, the research aims at producing

evidence that can be used to inform the policy formulation, to improve the maternal care and eventually improve maternal and child health outcomes.

Methodology:

In this study, the design was descriptive with assessment approach, in the timeframe of January 1st, 2023 to April 13th, 2023, after securing administrative consent of Dora Health Center to enable accessibility to pregnant women. The study was conducted in Primary Health Care Centers in the Baghdad City with purposive (non-probability) sample of 100 pregnant women. The self-administered questionnaire was used in data collection, which was created and revised by the investigators on the basis of the literature review and past related research. The scale was divided into 4 sections, namely demographic characteristics, obstetric history with 13 items on a 2-point Likert scale (Yes = 1, No = 2), nutritional status assessed with 13 items on a 2-point Likert scale (Yes = 1, No = 2), and nutritional knowledge with 9 items about the daily recommended allowance and foods to be avoided. Content validity was achieved through a panel of experts, who reviewed the clarity, relevance, and adequacy after which preliminary modifications were made. A pilot study was done between December 1st and December 30th 2022 on 20 pregnant women to pilot feasibility and instrument reliability. Cronbachs Alpha was used to determine internal consistency reliability in which the coefficient was found to be 0.78, which should be satisfactory. The questionnaire was distributed directly to collect the data taking not more than 10-15 minutes to complete, and the respondents were fully cooperative. Data collected were processed by means of SPSS version 24.0, where both descriptive and inferential statistics were used such as percentages, totals, and Cronbachs Alpha to test reliability.

Statistical analysis:

The SPSS version 26 was used to undertake quantitative analysis. Descriptive statistics was used and results were represented in terms of frequencies and percentages. Independent and paired t-tests (two tailed) and Mann-Whitney U test, Wilcoxon signed-rank and Chi-square test were used in accordance with the nature of the variable under analysis, which is normally distributed or non-normally distributed. A p-value of below 0.05 was taken to be statistically significant.

Ethical approval:

The human ethics committee of Al Dora Health Center gave the go-ahead to the study to facilitate access to pregnant women, Everyone who participated in the study was informed of the study and requested to sign a consent form. The patient was assured as well that his information would remain confidential.

Results

Socio-Demographic Characteristics of the Study Participants

The study results showed that the majority of pregnant women included in the sample were within the age group of 20–29 years (74.44%), while those over 30 years old constituted 22.56%, and those under 20 years old constituted 3.00%. Regarding educational level, it was found that more than half of the participants (52.63%) had an education at the preparatory level or above, while 45.11% had an education level between the sixth grade and intermediate school. The percentage of primary education (1–5 years) recorded a low percentage of 2.56%, and no cases of non-enrollment in school were recorded. Regarding employment status, the results showed that the vast majority of women (83.46%) were unemployed,

compared to only 16.54% who were employed. Regarding the monthly family income, the largest percentage of participants (62.41%) belonged to families with an income of more than 25,000 rupees, while the percentage of those with an income between (15,000-25,000) rupees was 24.81%, and 9.77% were in the category of (10,000-14,999) rupees, while the percentage of those whose family income was less than 10,000 rupees was only 3.01%.

Table 1: Distribution by Age, Education, Occupation, and Monthly Family Income

Characteristic	Number (n)	Percentage (%)
Age (in years)		
<20	4	3.00
20–29	99	74.44
>30	30	22.56
Education level		
No schooling	0	0.00
Year 1 to 5	3	2.56
Year 6 to O/L (Ordinary)	60	45.11
A/L and above (Advance)	70	52.63
Occupation level		
Employed	22	16.54
Not employed	111	83.46
Monthly family income (Rupees)		
<10000	4	3.01
10000–14999	13	9.77
15000–25000	33	24.81
>25000	83	62.41

Obstetric History and Risk Factors among the Study Participants

The study results showed that the average age of marriage among pregnant women was (22.2 ± 3.58) years, with the age group (20–29) constituting the vast majority at 74.44%, followed by the age group ≥ 30 years at 22.56%, while the percentage of women married before the age of twenty did not exceed 3.01%. The average age of the first pregnancy was (23.7 ± 3.74) years, with the highest percentage being between (20–29) years at 80.45%, followed by the age group <20 years at 14.29%, while the age group ≥ 30 years constituted only 5.26%. Regarding the number of births, the average number of pregnancies was (1.8 ± 0.77), with the second birth recording the largest percentage at 42.11%, followed by the first birth at 38.35%. The percentage of those who gave birth three times was 18.05%, while those who gave birth four or more times represented only 1.50%. The results also showed the presence of some pre-pregnancy risk factors, with miscarriage or stillbirth accounting for 8.27%, birth complications accounting for 12.78%, in addition to high blood pressure (1.50%) and pregnancy or postpartum bleeding (2.56%). Current risk factors included early pregnancy (below 18 years of age) at 1.50%, pregnancy after the age of 35 at 6.02%, as well as high blood pressure (2.26%) and short stature (3.76%).

Table 2: Distribution of Marriage Age, First Pregnancy Age, Parity, and Pre-/Present Pregnancy Risk Factors

Variables	Number (n)	Percentage (%)	Mean ($\pm$SD)
Marriage age			22.2 $\pm$ 3.58
- < 20 years	4	3.01	
- 20 to 29 years	99	74.44	
- $\geq$ 30 years	30	22.56	
Age at first pregnancy			23.7 $\pm$ 3.74
- < 20 years	19	14.29	
- 20 to 29 years	107	80.45	
- $\geq$ 30 years	7	5.26	
Parity			1.8 $\pm$ 0.77
- First	51	38.35	
- Second	56	42.11	
- Third	24	18.05	
- Fourth or more	2	1.50	
Pre-pregnancy risk factors			
- Abortion / Stillbirth	11	8.27	
- Hypertension	2	1.50	
- Antepartum / Postpartum Hemorrhage	3	2.56	
- Delivery complication/s	17	12.78	
Present risk factors			
- < 18 years	2	1.50	
- > 35 years	8	6.02	
- Hypertension	3	2.26	
- Short stature	5	3.76	

Nutritional Status of Pregnant Women Based on Pre-pregnancy BMI

The study results showed that 15.04% of women were underweight before pregnancy (BMI <18.5), with an actual weight gain of (4.05 $\pm$ 2.91) kg compared to the recommended value of (6.38 $\pm$ 1.32) kg, with a highly significant difference (p=0.000). Women with normal weight (BMI 18.5–22.99) constituted the largest proportion (44.36%), with an actual weight gain of (2.28 $\pm$ 1.91) kg compared to the recommended value of (4.84 $\pm$ 1.29) kg, with a statistically significant difference (p=0.000). Overweight women (BMI 23.00–27.49) accounted for 35.34%, with an average actual weight gain of (2.84 $\pm$ 2.46) kg compared to the recommended (3.23 $\pm$ 0.91) kg, with no statistically significant differences (p=0.203). Obese women

(BMI ≥ 27.5) accounted for 5.26%, with an actual weight gain of (1.87 ± 1.61) kg less than the recommended (3.43 ± 1.19) kg, with a statistically significant difference ($p=0.040$).

Table 3: Comparison of Actual and Recommended Weight Gain According to BMI Categories

Nutritional Status Based on Pre-pregnancy BMI (kg/m²)	Number (%)	Actual Weight Gain (kg) Mean $\pm$ SD	Recommended Weight Gain (kg) Mean $\pm$ SD*	P value
Underweight (< 18.50)	20 (15.04%)	4.05 ± 2.91	6.38 ± 1.32	0.000*
Normal (18.50 – 22.99)	59 (44.36%)	2.28 ± 1.91	4.84 ± 1.29	0.000*
Overweight (23.00 – 27.49)	47 (35.34%)	2.84 ± 2.46	3.23 ± 0.91	0.203
Obese (≥ 27.50)	7 (5.26%)	1.87 ± 1.61	3.43 ± 1.19	0.040*

Daily Nutrient Intake Compared to Recommended Dietary Allowances (RDA)

The table results indicate that the average daily energy intake was 2472.02 ± 366.85 kcal, with 66.92% of participants exceeding the recommended daily intake, while 33.08% were below the recommended value. The average protein intake was 74.19 ± 13.64 grams, with 87.97% of participants exceeding the recommended intake. Conversely, severe iron deficiency was observed, with no participant reaching the recommended intake (100% below the RDA). For calcium, the average intake was 844.95 ± 239.58 mg, with 75.94% of participants falling below the recommended value. For folic acid, the average intake was 420.90 ± 132.42 μ g, with 90.98% of participants falling below the recommended intake. Regarding vitamins, the average consumption of vitamin C was 71.44 ± 32.26 mg, with 68.42% of participants exceeding the recommended intake. Most participants did not exceed vitamin A, with the average consumption being 525.77 ± 154.86 mcg, and 96.24% of participants falling below the recommended intake.

Table 4: Percentage of Participants Above and Below RDA for Selected Nutrients

Nutrient (Units)	Dietary Intake Mean ($\pm$SD)	RDA*	Above RDA % (n)	Below RDA % (n)
Energy (kcal)	2472.02 (± 366.85)	2360	66.92% (89)	33.08% (44)
Protein (g)	74.19 (± 13.64)	59	87.97% (117)	12.03% (16)
Iron (mg)	16.52 (± 3.54)	33	0.00% (0)	100.00% (133)
Calcium (mg)	844.95 (± 239.58)	1000	24.06% (32)	75.94% (101)
Folic Acid (μ g)	420.90 (± 132.42)	600	9.02% (12)	90.98% (121)
Vitamin C (mg)	71.44 (± 32.26)	55	68.42% (91)	31.58% (42)
Vitamin A (μ g)	525.77 (± 154.86)	800	3.76% (5)	96.24% (128)

Discussion:

The aim of the present study was to assess the nutritional status of pregnant women who high fidelity centers (primary health care centers) focusing on the sociodemographic status, obstetric history, pre- and current pregnancy risk factors, body mass index, and the dietary intake of pregnant women attending health care centers. The results offer valuable conclusions about the health profile of the pregnant women in the setting under study and outline the major issues that should be addressed to enhance the outcomes of the mothers and children.

In terms of age, most pregnant women (74.44) were aged between 20 and 29 years with only 3% aged below 20 years. This is an excellent trend because teenage pregnancies are closely related with poor maternal and neonatal outcomes like preterm birth, low birth weight, and maternal complications (Abebe et al., 2020; Feyissa et al., 2023). The low percentage of teenage pregnancies with this sample indicates that there are effective awareness campaign and perhaps delayed marriage at an age that would minimize the risks involved. Alternatively, 22.56% of the women were above 30 years and were at risk of developing complications that include gestational diabetes and hypertension, which means that this sub-group needs a close follow-up (Zulu et al., 2022; Guler et al., 2021).

The level of education became a positive variable as over fifty percent (52.63) of the respondents had an A/L education level or above, with no women having no schooling at all. Health literacy, knowledge of dietary needs, and use of antenatal care services are closely connected with education (Essam et al., 2022; Das & Mishra, 2021). The fact that the education level of women in this study is relatively high is also indicative that women are in a better position to comprehend nutritional recommendations and embrace good practices. The result of this observation is different to those of previous reports in the Northern Province where a mere 20 percent of the women received A/L education, which indicates that there are regional disparities in educational access (Ahmed et al., 2022; Haini et al., 2023).

Concerning occupation, a majority of the respondents (83.46) were not working, and only 16.54% of the respondents were involved in formal employment. Unemployment can lower the economic independence, but this impact is probably mediated by household income levels (Thomson et al., 2023; Yang & D'Arcy, 2022). The monthly income in this research was majorly high with 62.41 percent of the families with an income of above 25,000 rupees with only 3 percent having a monthly income of less than 10,000 rupees. This indicates that even with a low level of employment, house hold economic position was comparatively stable which could be considered as a positive factor in dietary access and supplementation. This is supported by the positive relationship between nutritional status and family income ($p = 0.04$) (Song et al., 2023; Hao et al., 2024).

Trends to be observed in maternal health can also be observed in marriage and reproductive history. Mean age of marriage was 22.2 years, and the mean age of first pregnancy was 23.7 years which is in the socially and biologically safe child bearing age bracket. The distribution of parity revealed that a majority of women had one or two children with only 1.5% having four or more, which minimized the risks of maternal depletion syndrome (Demircan et al., 2024; Jayasinghe et al., 2023). Risk factors were also documented pre-pregnancy such as abortion and complications during delivery (12.83), however, their

rates were less than the previous research in Sri Lanka. Such a decrease can be explained by the improvement of maternal care services, the prevention of antenatal follow-up as well as the increased use of nutritional supplements (Agampodi et al., 2021; Springmann, 2025).

Nutritional status assessment using BMI showed that 44.36% of women were of normal pre-pregnancy BMI, 15.04% were underweight, 35.34% overweight and 5.26 obese. The level of overweight and obese women indicates an increasing trend of over-nutrition, which is in line with the trends of nutrition transition in the world. Notably, the weight gain was actually much lower than the recommended values in underweight and normal groups, which indicates that dietary intake is inadequate or that the metabolic needs are higher (Junior et al., 2023; Montvignier Monnet et al., 2022). However, overweight women did not demonstrate any significant correlation between actual and recommended weight gain, which needs to be paid attention to because insufficient weight gain in this group could be covering the risks of fetal growth restriction. It is established in the literature that undernutrition as well as excess weight during pregnancy is linked with complications, one of which is low birth weight, intrauterine growth restriction, and difficulties during delivery (Hunter et al., 2023; de la O et al., 2023).

Food intake examination also indicated nutritional deficits. Although the mean energy and protein intakes were much higher than the RDA levels of most of the participants, the levels of iron, calcium, folic acid, and vitamin A were lower than the recommendations. Remarkably, no women fulfilled the RDA of iron with the help of a diet, which is problematic, considering the vitality of iron in anemia prevention. Nevertheless, the number of anemic women in this study was 24.6 percent, which is less than the national average (DHS, 2009) but still large (Ball et al., 2004). This rather low level of prevalence can be attributed to extensive use of iron supplements that are being given at MCH clinics yet the dietary intake of iron is poor. On the same note, vitamin A intake was also deficient and only 3.76% were within the RDA indicating a low intake of animal-based foods and leafy vegetable. These gaps underscore the need to have long-term nutritional education with supplementation programs (Peddie et al., 2023).

The correlation between age and nutritional status ($p = 0.046$) also highlights the notion that maternal age also has an impact on health, and younger women may be more exposed to nutritional deficiencies. Interestingly, the education level did not have any significant relationship with nutritional status ($p = 0.73$), which indicates that knowledge per se might not be a crucial determinant of dietary adequacy and leave economic and cultural elements to play more important roles.

Conclusion:

To conclude, the present study has shown that the sociodemographic factors (age, education, and income) usually imply a positive maternal picture, but still, the nutritional issues still exist, particularly, the micronutrient deficits. The beneficial effects of the MCH clinic services and supplements are reflected in the comparatively low rates of anemia and the lack of obstetric complications. Nevertheless, the prevalence of overweight and obesity and poor nutrition intake of essential nutrients is an indicator of two-fold malnutrition burden that requires immediate response. Special interventions that take into

consideration dietary advice, balanced dietary supplementation, and encouragement of diversified diet are also suggested to improve maternal and child health further.

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