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ORIGINAL

Calidad de la dieta y estado nutricional de gestantes atendidas en hospitales públicos de Paraguay

Diet quality and nutritional status of pregnant women treated in public hospitals in Paraguay

Alex Bienvenido Giménez Brizueña[1], Gilda Guadalupe Silva Talavera[1], Maria Isabel López[1, 2], Telmo Raul Aveiro-Róbalo[1]

[1]Universidad del Pacifico. Asunción. Paraguay.
[2]Hospital Materno Infantil Loma Pyta. Asunción. Paraguay.

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Corresponding author: María Isabel López Ocampos

ABSTRACT

Introduction: diet quality plays a fundamental role in the development of a pregnancy.
Objective: to determine the quality of diet and nutritional status of pregnant women attending public hospitals in the capital during the period from July to September 2023.
Method: this was a descriptive, observational, cross-sectional, cross-sectional study with cross association, where 104 adult pregnant women were surveyed, with prior informed consent, sociodemographic and anthropometric variables were collected and a questionnaire on dietary habits was filled in. The data were digitalized in Microsoft Office® Excel® 2010 spreadsheets. They were analyzed with the statistical package Epi Info® version 7.2.5.0.
Results: those pregnant women who presented adequate nutritional status (n=23) according to anthropometric parameters obtained a higher mean score (8,61 ±1,59 SD), while those who presented some type of malnutrition obtained lower mean scores. No statistically significant difference was found between group averages when applying the ANOVA test (p>0,05).
Conclusion: excess malnutrition in pregnant women is high and the average diet quality score decreases in those who presented some type of malnutrition. Given the growing epidemic of chronic noncommunicable diseases, it is of vital importance to invest in public health policies that promote adequate nutrition during pregnancy, so that the quality of the diet can be improved.

Key words: Prenatal Nutrition; Sustainable Development; Maternal and Child Health.

RESUMEN

Introducción: la calidad de la dieta desempeña un papel fundamental en el desarrollo de un embarazo.
Objetivo: determinar la calidad de la dieta y el estado nutricional de gestantes que acuden a hospitales públicos de capital durante el periodo de tiempo comprendido entre julio y setiembre de 2023.
Método: de trató de un estudio descriptivo, observacional, transversal, con asociación cruzada, donde se realizaron encuestas a 104 gestantes adultas, con previo consentimiento informado, se tomaron variables sociodemográficas, antropométricas y cuestionario sobre hábitos alimentarios. Los datos se digitalizaron en planillas de Microsoft Office® Excel® 2010. Se analizaron con el paquete estadístico *Epi Info® versión 7.2.5.0*.
Resultados: aquellas gestantes que presentaron estado nutricional adecuado (n=23) obtuvieron un puntaje promedio mayor en cuanto a calidad de la dieta (8,61 ±1,59 DE), en cambio aquellas que presentaron algún

tipo de malnutrición obtuvieron puntajes promedio menores. No se encontró diferencia estadísticamente significativa entre promedios por grupos al aplicar el test de ANOVA (p>0,05).
Conclusión: la malnutrición por exceso en las gestantes es alta y el puntaje promedio de calidad de la dieta disminuyó en aquellas que presentaron algún tipo de malnutrición. Dada la creciente epidemia de enfermedades crónicas no trasmisibles, es de vital importancia invertir en políticas de salud pública que promuevan la alimentación adecuada durante el embarazo, de tal forma a prevenir resultados adversos para el binomio madre-hijo, considerando además el desafío que afronta el Paraguay en la consecución de los Objetivos de Desarrollo Sostenible "Hambre cero", "Salud y Bienestar".

Palabras claves: Nutrición Prenatal; Desarrollo Sostenible; Salud Materno-Infantil.

INTRODUCTION

Maternal nutritional status plays a fundamental role during pregnancy, as both deficiencies and excesses can have negative consequences for the health of both mother and child, including the development of complications during pregnancy, childbirth, and postpartum, as well as an increased risk of chronic diseases in adulthood.[1,2,3]

Poor diet during pregnancy can be reflected in an increase in the number of women with obesity, gestational diabetes, preeclampsia, anemia, or micronutrient deficiencies, such as vitamin A. It is estimated that 38,2 % of pregnant women worldwide have anemia, while in the Americas, the figure is 25 %.[1,2,3,4,5,6,7,8]

In this context, the systematic review conducted by Ramos Lafont C., et al, concludes that the dietary behavior determined by the habits and practices of women and their families takes on special importance during pregnancy, as it can represent the basis for maintaining health and reducing the risk of adverse outcomes.[6]

National and international recommendations on healthy eating during pregnancy include the consumption of dairy products, whole grains, legumes, eggs, lean meats, vegetable oils, nuts, vegetables, and fresh fruits and vegetables, as well as adequate water intake, the rational use of iodized salt in food preparation, and essential iron and folic acid supplementation, while avoiding sources of caffeine, alcohol, and other substances that could be harmful to the fetus. On the other hand, the consumption of processed and ultra-processed foods is discouraged, as they are characterized by high amounts of calories, sugars, fats, and sodium.[3,4, 6,7,8,9,10,11]

In a study conducted in Spain by Comas-Rovira M. et al., which aimed to evaluate the quality of the diet in a cohort of pregnant women in terms of adherence to the Mediterranean diet and to examine the association between diet quality, obesity, weight gain, fetal growth, and perinatal complications, it was found that only 35 % of pregnant women had a good diet quality. Diet quality increased significantly with lower body mass index (BMI) values and older maternal age.[12]

On the other hand, in a study conducted in Mexico, which included 125 pregnant women in their third trimester who attended prenatal consultations at a hospital in Nuevo Leon, the results showed that the average energy intake was 1 683,8 calories per day, 53,6 % consumed more saturated fat than recommended, while 76,8 % consumed more than 55 % of their energy in the form of carbohydrates and 86,4 % exceeded the recommended sugar intake. The median protein intake was 12,0 % of total caloric intake. Seventy-five percent of women consumed less than 22,5 grams of dietary fiber in total. The authors concluded that the results highlight the importance of knowing the energy and macronutrient intake of pregnant women, as it can influence fetal appetite programming and maternal complications. They suggest providing appropriate nutritional recommendations to each woman from the first trimester of pregnancy, considering her nutritional status and social environment.[13]

Pusko B. mentions that successful experiences from various geographical areas encourage the inclusion of a routine educational component in prenatal care, including personalized nutritional counseling.[1]

In Paraguay, according to anthropometric surveillance data applied to pregnant women (n=14,694) in 2021, there is a high rate of obesity (36,3 %) and maternal malnutrition (23,7 %). The population most affected by low weight is adolescents, and obesity is more prevalent in adult women.[14]

In research conducted by Cantero Grissetti E., which aimed to determine the quality of breakfast in different groups in the city of Asunción, 36 pregnant women were included, of whom 22,0 % had insufficient food quality at breakfast.[15]

Information on the quality of nutrition in this biological group is still very limited at the national level. Several studies indicate that analyzing the quality of the diet and its relationship with the nutritional status of pregnant women is essential to understand dietary patterns, identify strengths and weaknesses in the diet of this population, generate useful information for designing specific nutritional interventions, and develop policies and programs with an emphasis on food security that promote an adequate diet, thus contributing to the health of the mother-child dyad, also considering the commitment made to achieve Sustainable Development Goals 2 "Zero Hunger" and 3 "Good Health and Well-being".[16,17,18,19,20,21,22,23,24]

The purpose of this study is to determine the quality of the diet and nutritional status of pregnant women who attended two public hospitals in Asunción, Paraguay, during the months of July and September 2023.

METHOD

Design and study area

This was an observational, descriptive, cross-sectional study with cross-tabulation. It was conducted at the Loma Pyta Maternity and Children's Hospital and the Santísima Trinidad Maternity and Children's Hospital, both of which are part of the XVIII Health Region of the Ministry of Public Health and Social Welfare in Asunción, Paraguay.

Inclusion and exclusion criteria

Adult pregnant women from the second trimester of pregnancy who attended two public hospitals in the capital during the period between July and September 2023 were included. Adolescent pregnant women and the indigenous population were excluded.

Sample and sampling

The sample consisted of 104 pregnant women. The sampling was non-probabilistic, based on convenience.

Recruitment

Pregnant women were recruited through scheduled visits to the hospitals included in the study, with prior permission from the institutional authorities, taking into account their attendance at the clinic during office hours.

Data collection

Data collection was carried out through visits to the hospitals included in the study, with prior authorization to conduct the survey using the Google Forms tool® from mobile devices. On the one hand, the interview on was conducted on dietary habits to determine the quality of the diet using the questionnaire adapted from KIDMED. On the other hand, data from the prenatal control form of the pregnant women was accessed, from which the height, weight (last record corresponding to the date of sample collection), and hemoglobin level in the second trimester were obtained. Subsequently, the nutritional status was determined using the Rosso Mardones 1986 weight gain curve for pregnant women (25), and hemoglobin levels were characterized according to the World Health Organization cut-off points.[7,8]

The survey used by the researchers to determine diet quality was an adaptation of KIDMED 2.0(*), which consists of 16 items covering different aspects of the nutritional quality of the diet for pregnant women, based on recommendations from the World Health Organization and the Paraguayan Dietary Guidelines. It has a maximum scale of 12 points, with 12 items adding 1 point and 4 items subtracting 1 point. The scores are interpreted as 3 grades according to the range of points obtained: equal to or less than 3 points = low diet quality, 4 to 7 points = intermediate diet quality, 8 to 12 points = good diet quality.

(*) The KIDMED questionnaire is a tool used to assess adherence to the Mediterranean diet in children and adolescents. It was developed and validated in a sample of the Spanish population by Serra Majem et al. in 2004. This questionnaire consists of 16 items that address different aspects related to the nutritional quality of breakfast, the frequency of food consumption, and the presence of fast food, among others. KIDMED is used to obtain a measure of adherence to the Mediterranean diet in this population and can be useful for identifying healthy eating patterns or areas where improvements can be made in the diet.[26]

Data processing and analysis

The data were digitized in Microsoft Office® Excel® 2010 spreadsheets. They were then analyzed using the *Epi Info* statistical package *(®, version 7*.2.5.0). The descriptive section of the results was expressed according to whether the variables were quantitative or qualitative. For quantitative variables, the results were presented as means and standard deviations. In the case of qualitative variables, the results were presented as absolute frequencies (n) and relative frequencies (%). To relate the diet quality and nutritional status variables, ANOVA and Chi-square tests were applied with a statistical significance value of p<0,05.

Ethical issues

The ethical principles of confidentiality, respect, autonomy, beneficence, and justice were taken into account. All pregnant women received the results of their anthropometric evaluation and were referred to nutrition professionals. The work was evaluated and approved by the ethics committee of the University of the Pacific.

RESULTS

The sample consisted of 104 pregnant women, of whom 54,8 % (n=57) were found at the Santísima Trinidad Maternity and Children's Hospital and 45,1 % (n=47) at the Loma Pyta Maternity and Children's Hospital between July and September 2023.

Table 1 shows the sociodemographic data of the sample of pregnant women, highlighting that the most common age group is 20 to 24 years old, with 33,65 %, while the 25 to 29 age group accounts for 28,85 %. In terms of department of origin, 49,04 % came from the central department, followed by 39,42 % from the capital. With regard to educational level, 12,50 % did not complete secondary education and 9,62 % had incomplete primary education. Regarding the occupation of pregnant women, 57,69 % reported being housewives, while 18,27 % were self-employed, 44,66 % reported an income between 1 and 2 minimum wages, and 41,75 % reported an income below the minimum wage. Sixty-four point forty-two percent were in stable unions and 21,15 % were single.

Table 1. Sociodemographic data of the pregnant women evaluated

Age group	n	%
20 to 24	35	33
25 to 29 years old	30	28
30 to 34	27	25
35 to 39	10	9,6
Over 40 years old	2	1,92
Total	104	100
Department	n	%
Capital	41	39,42
Central	51	49,04
Other	12	11,54
Total	104	100,00
Level of education	n	%
Complete secondary education	7	6,73
Incomplete BSE	10	9,62
Complete EM	57	54,81
Incomplete EM	13	12,5
Higher education	17	16,35
Total	104	100,00
Occupancy	n	%
Housewife	6	57,6
Private sector employee	7	6
Public sector employee	3	2
Student	15	14
Self-employed	19	18,27
Total	10	100
Income	n	%
Between 1 and 2 minimum wages	46	44,66
More than 2 minimum wages	14	13,59
Less than minimum wage	43	41,75
Total	103	100
Marital status	n	%
Married	14	13,46
Separated	1	0,96
Single	22	21,15
Stable relationship	67	64,42
Total	104	100

55,77 % of pregnant women were in their second trimester and 44,23 % were in their third trimester. Regarding the presence of anemia, 81,73 % had hemoglobin values within the expected range, and 18,26 % had hemoglobin values below 10,5 mg/dl for the second trimester and below 11 mg/dl for the third trimester (table 2). The nutritional status of pregnant women according to anthropometry showed 47,12 % obesity, 19,23 % overweight, and 11,54 % underweight, while 22,12 % had adequate nutritional status. In terms of diet quality, 2,88 % were classified as low quality, 31,33 % as intermediate quality, and 65,38 % as good quality (table 2).

Table 2. Obstetric history and diet quality of pregnant women

Gestational trimester	n	%
Second trimester	58	55,7
Third Quarter	46	44,2
Presence of anemia	n	%
With anemia	19	18,26
Without anemia	85	81,7
Nutritional status of pregnant women	n	%
Adequate	23	22,12
Underweight	12	11,54
Obesity	49	47,12
Overweight	20	19,2
Diet Quality Category	n	%
Good (8 to 12 points)	6	65,3
Intermediate (4 to 7 points)	33	31,7
Low (equal to or less than 3 points)	3	2,88
Total	104	100,00

Table 3 shows the results of the dietary habits of the pregnant women surveyed, highlighting that 73,08 % consume sugary or diet drinks and 57,69 % consume processed meats one or more times a week. Forty-eight point zero eight percent reported that they do not consume whole grains, 11,54 % consume more than three cups of coffee, tea, or tea per day, 8,65 % consume sweets one or more times per week, 32,69 % reported not consuming 3 whole fruits per day, and 44,23 % do not consume at least 1 egg per day.

Table 3. Dietary practices of pregnant women surveyed

Questionnaire adapted according to recommendations for nutrition and nutrient supplementation during pregnancy.	**YES**		**NO**	
	n	**%**	**n**	**%**
Eat at least 3 whole fruits per day	70	67,3	3	32
Eat raw vegetables in salads at least twice a day	88	84	16	15
Eat cooked vegetables at least twice a day.	93	89,42	11	10,5
Eat legumes, beans, and lentils at least once a week.	87	83	17	16
Eat whole grain bread, rice, and noodles at least once a day.	54	51	50	4
Consume milk, yogurt, cheese at least 4 times per day.	86	82	1	17
Eat lean red meat, chicken, and fish at least 3 to 4 times a week.	104	100	0	0
Consume sugary or diet drinks 1 or more times per week.	76	73	2	26
Consumes processed meats 1 or more times per week	60	57,69	4	42
Add a teaspoon of vegetable oil to salads at least twice a day	62	59,62	42	40,38
Use iodized salt to prepare your meals.	10	96,15	4	3,8
Eat sweets 1 or more times a week	9	8,65	9	91,3
Consume iron and folic acid supplements every day	103	99,04	1	0,96
Consume more than 3 cups of brewed coffee or tea per day	12	1	92	8
Consume at least 1 egg per day	58	55,7	46	44,2
Drink more than 2 liters of water per day	88	84,6	16	15,38

It was found that 37,04 % of pregnant women with a low to moderate diet quality were malnourished, while 73,91 % of those with a good diet quality were not malnourished (table 4), although no relationship between variables could be demonstrated ($p>0,05$).

Table 4. Presence of malnutrition according to diet quality

Diet Quality	Without malnutrition		With malnutrition		Total	
	n	%	n	%	n	%
Intermediate to Low	6	26,09	30	37,04	36	34,62
Good	17	73,91	51	62,96	68	65,38
Total	23	22,12	81	77,88	104	100

Pregnant women who had adequate nutritional status (n=23) according to anthropometric parameters obtained a higher average score (8,61 ±1,59 SD), while those who had some type of malnutrition obtained lower average scores. No statistically significant difference was found between group averages when applying the ANOVA test (table 5).

Table 5. Average diet quality score according to the nutritional status of pregnant women

Nutritional status	n		Average Score	± DE
Adequate	23	22,12	8,61	1,59
Low weight	12	11,54	7,09	2,60
Overweight	20	19,23	7,85	2,23
Obesity	49	47,12	8,06	2,38

Note: ANOVA (p<0,05).

DISCUSSION

In the present study, no statistically significant difference was found between diet quality and nutritional status in pregnant women. However, it was observed that those who obtained higher diet quality scores had adequate nutritional status, while those who were underweight, overweight, or obese had lower diet quality scores. These findings are similar to the results of the study by Comas-Rovira M. et al, where diet quality increased significantly with lower Body Mass Index values.[12]

In terms of dietary habits, 33 % of pregnant women did not meet the recommended daily intake of whole fruits, and 17 % did not meet the recommended calcium intake from dairy products. On the other hand, in a study conducted in Paraguay by Cantero Grissetti E., which aimed to measure the quality of breakfast in various groups, including pregnant women, it was found that only 8 % had good quality, concluding that the greatest deficiency identified was fruit consumption, which could negatively impact daily intake of vitamins, minerals, and fiber.[15]

The study by Zárate-Pérez de Calderón M. E. et al, conducted in 2022, found that the average calorie intake was lower than recommended; inadequate in fat, calcium, and zinc; sufficient in protein, carbohydrates, vitamins A and C; and deficient in iron.[20] In the present study, 18 % of pregnant women had hemoglobin values below the expected range.

In the present study, it was found that 3,85 % do not consume iodized salt. In the study by Sánchez Bernal S. et al, it was concluded that one in four pregnant women has insufficient iodine intake based on urinary excretion.[27]

The results obtained on nutritional status are consistent with those reported by the Food and Nutrition Surveillance System (SISVAN), which in 2021 showed a high percentage of pregnant women who were overweight (14,3 %) and obese (42,5 %).[14]

With regard to occupation, 57,69 % reported being housewives, followed by 18,27 % who were self-employed. It was observed that 44,66 % had an income between 1 and 2 minimum wages and 41,75 % had less than the minimum wage. Sixty-four point forty-two percent reported being in a stable relationship, and 21,15 % were single. The study by Tijerina Sáenz A. et al evaluated the energy and macronutrient intake of 125 women in the third trimester of pregnancy who attended prenatal care at the Regional Maternal and Child Hospital in Nuevo León, Mexico. The average age of the participants was 22,9 ± 5,9 years (15–35 years). Most of the participants had completed secondary education (58,4 %) and their main occupation was housewife (90,4 %). Forty-five point six percent lived in a common-law relationship.[13]

The main limitation of the study was the sample size. A strength was the adaptation of an instrument to measure diet quality, used for the first time in pregnant women, which may be useful for future research.

It was concluded that excessive malnutrition in the sample of pregnant women evaluated is high and that the average diet quality score is lower in those with some type of malnutrition.

Given the growing epidemic of chronic noncommunicable diseases currently in Paraguay, it is vitally important to invest in public health policies that promote adequate nutrition during pregnancy, ensuring food security

and education for this vulnerable group, in order to prevent adverse outcomes for the mother-child dyad, both in the short and long term, also considering the challenge facing the country in achieving the Sustainable Development Goals (SDGs); SDG 2 “Zero Hunger” and SDG 3 “Good Health and Well-being.”

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CONFLICTS OF INTEREST

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AUTHOR CONTRIBUTIONS

Conceptualisation: Alex Bienvenido Giménez Brizueña, Gilda Guadalupe Silva Talavera, Maria Isabel López, Telmo Raul Aveiro-Róbalo.

Methodology: Alex Bienvenido Giménez Brizueña, Gilda Guadalupe Silva Talavera, Maria Isabel López, Telmo Raul Aveiro-Róbalo.

*Researc*h: Alex Bienvenido Giménez Brizueña, Gilda Guadalupe Silva Talavera, Maria Isabel López, Telmo Raul Aveiro-Róbalo.

Visualisation: Alex Bienvenido Giménez Brizueña, Gilda Guadalupe Silva Talavera, Maria Isabel López, Telmo Raul Aveiro-Róbalo.

Project management: Alex Bienvenido Giménez Brizueña, Gilda Guadalupe Silva Talavera, Maria Isabel López, Telmo Raul Aveiro-Róbalo..

Writing - Original draft: Alex Bienvenido Giménez Brizueña, Gilda Guadalupe Silva Talavera, Maria Isabel López, Telmo Raul Aveiro-Róbalo.

Writing - Proofreading and editing: Alex Bienvenido Giménez Brizueña, Gilda Guadalupe Silva Talavera, Maria Isabel López, Telmo Raul Aveiro-Róbalo.