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ANEMIA IN UNIVERSITY WOMEN AND ITS ASSOCIATION WITH FOOD CONSUMPTION

ANEMIA EM MULHERES UNIVERSITÁRIAS E SUA ASSOCIAÇÃO COM O CONSUMO DE ALIMENTOS

ANEMIA EN MUJERES UNIVERSITARIAS Y SU ASOCIACIÓN CON EL CONSUMO DE ALIMENTOS

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ABSTRACT

Objective: determining the prevalence of anemia and the relationship with food consumption in university female students. **Method:** a cross-sectional, descriptive and analytical study conducted with 140 university female students aged 18-45 years old in higher education institutions of public and private network in Teresina (PI). For determination of hemoglobin, blood samples were collected by puncture of the fingertip, by the cyanmethaemoglobin method. There were used questionnaires of food intake frequency to assess iron intake. The study had the project approved by the Research Ethics Committee under CAAE: 123600009679.

Results: the prevalence of anemia was of 79,2% (111) of the total sample studied; 54,9% of students with anemia belonged to the public institution, while the private university had 45,1%. **Conclusion:** possibly the high prevalence of anemia have occurred because of inadequate supply of iron absorption facilitators and consumption of refined carbohydrates without fortification. **Descriptors:** Iron Deficiency Anemia; Hemoglobins; Iron Deficiency.

RESUMO

Objetivo: determinar a prevalência de anemia e a relação com o consumo de alimentos em universitárias.

Método: estudo transversal, descritivo e analítico, realizado com 140 universitárias de 18 a 45 anos, em instituições de ensino superior da rede pública e privada de Teresina (PI). Para determinação da hemoglobina, foram coletadas amostras de sangue através da punção da polpa digital, pelo método cianometahemoglobina. Foram utilizados questionários de frequência de consumo alimentar para avaliação do consumo de ferro. O estudo teve aprovado no Comitê de Ética em Pesquisa o projeto sob CAAE nº. 123600009679. **Resultados:** a prevalência de anemia foi de 79,2% (111) do total da amostra pesquisada; 54,9% das estudantes com anemia pertenciam à instituição pública, enquanto a universidade privada apresentou 45,1%. **Conclusão:** possivelmente a alta prevalência de anemia tenha ocorrido em razão da alimentação inadequada de facilitadores da absorção do ferro e consumo de carboidratos refinados sem fortificação. **Descritores:** Anemia Ferropriva; Hemoglobinas; Deficiência de Ferro.

RESUMEN

Objetivo: determinar la prevalencia de anemia y la relación con el consumo de alimentos en las estudiantes universitarias. **Método:** un estudio transversal, descriptivo y analítico realizado con 140 universitarias entre 18-45 años en las instituciones de educación superior de la red pública y privada de Teresina (PI). Para la determinación de la hemoglobina, las muestras de sangre se recogieron mediante punción de la yema del dedo, por el método de cianometahemoglobina. Se utilizaron cuestionarios de frecuencia de consumo de alimentos para evaluar la ingesta de hierro. El estudio tuvo el proyecto aprobado por el Comité de Ética en la Investigación bajo CAAE: 123600009679. **Resultados:** la prevalencia de anemia fue de 79,2% (111) de la muestra total estudiada; 54,9% de los estudiantes con anemia pertenecido a la institución pública, mientras que la universidad privada tenía 45,1%. **Conclusión:** es posible que la alta prevalencia de anemia se haya producido a causa de un suministro inadecuado de los facilitadores de la absorción de hierro y el consumo de carboidratos refinados y sin fortificación. **Descriptores:** Anemia por Deficiencia de Hierro; Hemoglobinas; Deficiencia de Hierro.

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INTRODUCTION

Anemia is a situation where nutrition levels of hemoglobin (Hb) in the blood are lower than those considered suitable for age, gender, physiological condition and height as a result of a lack of important nutrients, regardless of the origin of this deficiency. Epidemiologically, the most frequent cause of anemia is iron deficiency.¹

Anemia can be caused by several factors. About 50% of episodes are due to iron deficiency, caused by insufficient intake of iron. The other conditions are linked to deficiencies of folate, vitamin B12 or vitamin A, recurrent inflammatory diseases, parasitic infections and hereditary diseases.² Iron deficiency anemia is a nutritional disorder of extreme intensity, highlighting the high coverage in all classes of society.³ In the core of this population, certain groups such as infants, preschoolers, teenagers, pregnant women and women of childbearing age are most affected.²

Regarding the extent of anemia in Brazil, the National Demographic and Health Survey figures state that the prevalence of this nutritional disorder among children under five years old is of 20,9%, and 24,1% in children younger than 2 years old.³ Variety of researches conducted in the country show that the average prevalence of anemia in children under five years is of 50%, reaching 52% in that coexisted in schools/kindergartens and 60,2% in who were often the Basic Health Units.^{1,4}

The anemia in women of childbearing age have reserved seriously because it affects not only the woman but also the fruit of conception. Adequate intake of iron, for a woman of childbearing age, prevents a future pregnancy risk, anemia and iron deficiency in pregnant women, and a child with low birth weight.²

Analyzing that bad eating habits are the main determinants of iron deficiency in the body, and the fortification of foods in the eating habits of Brazilian families contributes to the reduction of mineral deficiency risk. Actions for the prevention of anemia include not only food fortification, but also guidance related to increased intake of natural sources of iron and foods that benefit the absorption of mineral and reducing those that hinder its absorption.⁵

There are few studies that characterize the anemia situation in the group of women of childbearing age, so justifies conduct this study in order to obtain data that allowed

recognizing the status of anemia and its relation to food consumption in that group. Thus, the objective is to determine the prevalence of anemia and the relationship with food consumption in university.

METHOD

This is a field study of cross, descriptive and analytical type, conducted from June to December 2009, in two higher education institutions in the city of Teresina (PI). It was chosen by lot, a public institution (UFPI) and private (CEUT).

The study was conducted with 140 university female students who agreed to participate in the survey, 70 public institutions and 70 private institutions, aged 18-45 years old, with no previous anemia diagnosis were excluded from the study pregnant women, and women who presented pathologies that could affect results.

Data were collected in the Campus Minister Petronio Portela of the Federal University of Piauí (UFPI), and the Faculty of Human Sciences, Exact Sciences, Health and Legal of Teresina (CEUT). The participants were informed previously about the study objectives and procedures and agreed to participate voluntarily, by signing consent form clarified (IC), according to Resolution 466/12.⁶

Then, there were filled by graduate student and trained employees, Identification Card and the Food Consumption Frequency Questionnaire (FFQ) - validated previously⁷ study participants who agreed to cooperate with the survey. The FFQ contained the frequency of consumption of foods containing iron, facilitators and inhibitors of absorption, the amount of times (1-7, never, daily/weekly/monthly) or are consumed rarely, according to the food groups.

The method for determination of hemoglobin was the cyanmethaemoglobin.⁸ Through the fingertip puncture skin asepsis with alcohol, and using disposable material (lancet), a blood sample was collected (20µl) in Shali pipette and placed in test tubes containing 5 ml of Drabkin's solution (potassium cyanide, potassium ferrocyanide, sodium bicarbonate) at the homogenization due care not to produce hemolysis.⁷

The tubes containing blood and Drabkin solution were placed in Styrofoam shelf and put in the refrigerator. The reading was performed in spectrophotometer CELM brand, model and = 210D, the accuracy varies from three decimal places. The cutoff point for anemia in women over 12 years old is of <12

g/dl. There were considered with anemia, women with hemoglobin levels below 12,0

g/dL.⁹ Hemoglobin concentration was obtained using the following formula:

Factor C
P

Factor XD = hemoglobin (sample)
C = hemoglobin concentration of standard
P = standard reading
D = sample reading

This study had the project approved by the Research Ethics Committee of the Federal University of Piauí; project under CAAE: 123600009679. Privacy, data reliability and anonymity of the women involved in this study was guaranteed. The use and disposal of information and material collected were for the exclusive use of this research.

RESULTS AND DISCUSSION

The sample was selected by lot, totaling 140 university female students, 70 (50%) of a public institution and 70 (50%) of a private institution. There was used the Bartlett's statistical test to verify the homogeneity of

variance between the students, the Chi-square was 3,89 with a $p = 0,678$, showing that populations are homogeneous.

It is described in Table 1, the average hemoglobin of university according to type of educational institution. The overall mean hemoglobin among the students was around 10,8 (140), when analyzed separately by institution, the population of the public university averaged 10.4, while the people who attended the private higher education proved hemoglobin with an average around 11,3. The applied statistical test showed difference statistically between the universities.

Table 1. Average Hemoglobin of university students according to the type of educational institution. Teresina (PI), 2010.

Type of the Institution	Hemoglobin		
	Average	Median	SD
Public	10,4	10,5	1,1
Private	11,3	11,4	1,0
General	10,8	11,1	1,0
Statistics	t = 6,63 p = 0,001		

The study shows a prevalence of anemia in university students of 79.2% (111) of the overall total surveyed. Analyzing separately each institution, it was observed that 54.9% of students with anemia belonged to the public

institution, while the private university showed 45.1% of anemic women. From a statistical point of view, the survey revealed a significant difference between the variables, as shown in Table 2.

Table 2. Distribution of anemia by type of institution. Teresina (PI), 2010.

Students	Type of the institution					
	Public		Private		Total	
	nº	%	nº	%	nº	%
Anemic	61	87,1 (54,9)	50	71,4 (45,1)	111	79,2 (100,0)
Non-anemic	09	12,9 (31,0)	20	28,6 (69,0)	29	10,8 (100,0)
Total	70	100,0	70	100,0	140	100,0

Where: $\chi^2 = 5,26p = 0,021$

Iron deficiency anemia is spread across all social groups, while maintaining close relationship with poverty, low education and poor living conditions, precisely the profile of

most women delivering in public health services.¹⁰

It is presented in Table 3, the frequency of food consumption of the university participating in the survey.

Table 3. Food Consumption frequency of university girls. Teresina (PI), 2010

Food	Never		Rarely		Daily		Weekly		Monthly	
	Priv	Part	Priv	Part	Priv	Part	Priv	Part	Priv	Part
Rice, bread, biscuit	-	-	-	-	81,4	81,4	17,2	18,6	1,4	-
Kale, spinach, broccoli, other dark green	1,4	1,4	80,0	85,7	1,4	-	4,3	2,9	12,9	10,0
Carrot, pumpkin	-	-	4,3	5,7	14,3	11,4	28,5	27,2	52,9	55,7
Corn flour, cornmeal	-	-	11,4	11,4	30,0	27,1	25,7	28,6	32,9	32,9
Spaghetti, cassava flour	-	-	7,2	10,0	61,4	61,4	25,7	18,6	5,7	10,0
Butter, margarine	5,6	7,2	10,0	11,4	58,6	61,4	12,9	14,3	12,9	5,7
Milk	4,3	4,3	7,1	8,6	74,3	75,7	8,6	7,1	5,7	4,3
Coffee	1,4	1,4	7,2	11,4	50,0	57,2	30,0	18,6	11,4	11,4
Cheeses, yogurt	-	-	11,4	8,5	38,6	32,9	42,9	52,9	7,1	5,7
Egg yolk	-	-	64,2	67,1	8,6	8,6	18,6	20,0	8,6	4,3
Avocado	-	-	85,7	84,3	-	-	11,4	7,1	2,9	8,6
Beef	-	-	7,2	7,1	55,7	65,7	31,4	20,1	5,7	7,1
Viscera, giblets	35,7	20,0	54,3	50,0	-	-	5,7	20,0	4,3	10,0
Pork, chicken	15,7	20,0	17,1	18,6	14,3	17,1	8,6	12,9	44,3	31,4
Goat meat and the like	41,5	42,9	47,1	42,9	-	-	5,7	4,3	5,7	10,0
Fish	15,7	30,0	58,6	47,1	2,9	2,9	15,7	10,0	7,1	10,0
Papaya, cantaloupe, banana, mango	-	-	27,1	14,3	7,1	11,4	52,9	51,4	12,9	22,9
Orange, lime, lemon, tangerine, guava, cashew, hog plum	-	-	15,8	18,6	7,1	2,9	67,1	51,4	10,0	27,1
Other fruits	-	-	41,5	24,2	5,7	2,9	31,4	44,3	21,4	28,6
Snacks, other snacks	-	-	4,3	2,9	80,0	84,2	10,0	8,6	5,7	4,3
Chocolate milk	14,3	15,7	17,1	17,1	14,3	15,7	37,2	38,6	17,1	12,9
Sugar biscuit	-	5,7	17,1	20,0	14,3	15,7	54,3	32,9	14,3	25,7
Rice flour, starch	15,7	17,1	45,7	58,6	8,6	-	28,6	18,6	1,4	5,7
Hard brown sugar, candy	-	-	90,0	81,4	-	-	5,7	8,6	4,3	10,0
Bean	-	-	5,7	5,7	64,3	67,1	24,3	24,3	5,7	2,9

The subjects had good food condition in relation to the daily intake of iron-rich foods such as meat and vegetables.

Foods fortified with iron showed clear presence in food of all women, and rice, bread and biscuit consumed daily as it reiterates results of other studies.^{5,11-4}

Facilitators for absorption, such as: fruits, natural juices and vegetables and leafy experienced have unsatisfactory daily consumption. Citrus fruits are rich in ascorbic acid, are known stimulants of iron absorption; however, so they can act accordingly and increase mineral absorption of plant origin (non-heme iron), should be consumed daily with the main meals, lunch and dinner.¹⁵ Thus, one should strengthen the guidance of the consumption of citrus fruits with the main meals for the proper utilization of the mineral.

In turn, coffee and milk are identified as potential iron absorption inhibitors, but this action is only observed when excessive quantities of these foods are consumed in one meal.¹⁵

In the study, it was observed that the consumption of food inhibitors coincided with the schedule of large meals therefore interfere with the absorption of the mineral (coffee, dairy products).

CONCLUSION

Possibly the high prevalence of anemia in groups occurred due to inadequate food intake in relation to iron absorption facilitators, and consumption of refined carbon hydrates without fortification. The absorption of dietary iron is dependent on numerous factors, including: type of ingested iron, organic mineral reserves and combination of foods in the same meal, so it is necessary nutritional counseling along to the measures implemented or implemented in order modifying consumption habits, as regards the choice, mix and preparation of food.

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