

## RESEARCH ARTICLE

## Dietary analysis of caregivers of pediatric cancer patients at the Hospital Infantil de México Federico Gómez

Diana Ávila-Montiel,<sup>1</sup> Valeria Ortega-Martin,<sup>1</sup> Jenifer Ruiz-Cano,<sup>1</sup> Elisa Dorantes-Acosta,<sup>2</sup> Miguel Klunder-Klunder,<sup>3</sup> Onofre Muñoz-Hernández,<sup>1</sup> Juan Garduño-Espinosa<sup>1</sup>

### ABSTRACT

**Background.** The admission of a family member to the hospital represents a complex social and cultural phenomenon. Little research about caregivers and their basic needs such as nutrition has been carried out. The aim of this study is to assess the diet of caregivers of pediatric patients with cancer and to qualitatively describe the conditions associated with meals during hospitalization of a family member.

**Methods.** Fifty three caregivers of hospitalized patients in the Oncology Department at the Hospital Infantil de México Federico Gómez were surveyed. The 24-h reminder was used every day throughout the process of hospitalization. Finally, surveys were conducted in order to qualitatively describe food intake of caregivers during the feeding process in a hospitalization period.

**Results.** Women caregivers outnumbered men ( $n = 43$ , 81%). Body mass index (BMI) at the beginning of the study was  $25.5 \pm 5 \text{ kg/m}^2$  ( $\bar{X} \pm \text{SD}$ ). Caloric intake per day of caregivers at the beginning of the hospitalization period was lower than medical recommendations for the Mexican population (2500 kcal). In the qualitative description, it was found that most caregivers eat breakfast (86%) and only a third eat dinner (32%). Although 71% of caregivers ate something from the patients' food tray, the most common way to obtain food was by purchase.

**Conclusions.** Study subjects were overweight according to their BMI ( $\geq 25 \text{ kg/m}^2$ ). Despite caloric intake being lower than recommended, intake distribution was acceptable according to the macronutrient distribution. Half of the caregivers studied had three meals but often experienced long periods of fasting.

**Key words:** caregivers, nutrition, cancer patients, food intake, hospitalization.

### INTRODUCTION

According to the World Health Organization (WHO), in 2006 cancer was the second leading cause of death among noncommunicable diseases worldwide.<sup>1</sup> In Mexico, adult cancer is the third leading cause of death, whereas in the 5- to 14-year-old age group it is the second cause of death, with leukemia being the cause of 52% of deaths. Other cancers caused 16% of deaths in this age group.<sup>2</sup>

During cancer treatment the daily life of patients and their relatives is seriously affected. The disease itself—and in some cases the side effects of chemotherapy and radiation—causes frequent and sometimes lengthy hospital

visits. Hospital admission of a family member represents an entire social and cultural phenomenon. Some studies have considered the caregiver as an additional hospital resource; however, there are few studies that report on the basic needs of caregivers such as eating, personal care and resting, among others.<sup>3</sup>

Although hospitals recognize the importance of caregivers as emotional support to the patient, and they perform activities that health personnel would not be able to do, hospitals do not have the infrastructure to provide any basic services while the caregivers are at the hospital.

Food security is a term that refers to full access to food for all individuals at different stages and during dif-

<sup>1</sup> Dirección de Investigación

<sup>2</sup> Servicio de Hemato-Oncología

<sup>3</sup> Departamento de Investigación en Salud Comunitaria

Hospital Infantil de México Federico Gómez, México D.F., México

Received for publication: 2-5-13

Accepted for publication: 3-5-13

ferent life situations in order to obtain and maintain a full and healthy life. Food is a basic need for every human and may represent a problem for the caregiver for various reasons: not wanting to be separated from the patient, may be disoriented because of the location of the hospital, may have lack of funds or may be afraid of an unknown environment.<sup>4</sup>

Hospitals do not have the necessary infrastructure to meet the food needs of caregivers, making eating at the hospital an unfavorable condition. Acquisition and food preservation is a problem for the companion, which becomes more evident as the time spent with the patient increases.<sup>5</sup> In addition to this, it has been reported that the patient's diet may also be impaired for two main reasons related to the caregiver: 1) the patient may share food with the companion and 2) the patient may consume inappropriate food brought by the caregiver.<sup>6</sup>

The aim of this study was to analyze the diet of caregivers of children with cancer treated at the Hospital Infantil de México Federico Gómez (HIMFG) in order to identify the conditions that occur during hospitalization.<sup>7</sup>

## SUBJECTS AND METHODS

A descriptive cross-sectional study was carried out and included a sample of 53 caregivers of pediatric cancer patients without regard to gender, age, level of education, marital status and place of origin. Caregivers remained in the ward of HIMFG for at least 2 days. The caregivers agreed to participate in the study and signed informed consent.

A caregiver was identified as the person who was responsible for the patient during the interview day. The caregiver was located next to the bedside and was asked about his/her relationship to the patient (Table 1). Patients remained hospitalized an average of 5 days (SD = 5); 53 caregivers were interviewed on the first day of hospitalization, 50 on the second day and 40 on the third day. No data are presented from subsequent days because the sample was progressively reduced.

The weight of the participants was determined (in kg) with a SECA scale (model 882), which was transported to the oncology ward of HIMFG. Height (in cm) was obtained by the information that participants provided. Caregivers who disregarded this information were eliminated from the study ( $n=5$ ). All measurements were performed

by two dietitians trained in anthropometry and trained to apply the 24-h food reminder (R24).

With the weight and height obtained from each caregiver, body mass index (BMI) was obtained and participants were placed according to NOM-015-SSA2-1994 in the categories of normal weight (BMI 18-24.9 kg/m<sup>2</sup>), overweight (BMI 25-29.9 kg/m<sup>2</sup>) and obese (BMI  $\geq 30$  kg/m<sup>2</sup>).<sup>8</sup>

In order to determine the caloric intake and macronutrients of caregivers, they were given a 24-h reminder (R24). To improve the quality of the information collected and reduce memory bias, the study was conducted as follows: the caregiver was asked to recall all foods consumed the previous 24 h. Once this was completed, a listing of foods that could be consumed and are easily forgotten (quick list of foods) was mentioned, with the aim of strengthening the reminder. Foods that were mentioned in the reminder were located according to corresponding meal times (breakfast, lunch, dinner and snacks). Subsequently, information was requested regarding the preparation of the dishes and ingredients, as well as the amounts. Nutrikit food replicas were used and printed in actual size to guide caregivers in regard to portion sizes that they ingested. Caregivers were asked if they had eaten the dish in whole or in what amount and, finally, they were asked to indicate where it was purchased and consumed (if they bought it, brought it from home or was a gift). The recommended average calorie intake for caregivers was calculated using the WHO formula, which considers the weight, height, gender and physical activity of each caregiver.

The survey included six questions to determine the characteristics and conditions of the caregiver's diet: if they remained hungry, if they brought or kept food in the hospital and if food was shared with the patient. This survey was intended to describe a typical day's supply of food of the caregivers during their stay with their patient. The results were analyzed using the program FoodProcessor and Stata v. 11.0. For a description of the data, summary measures and dispersion were used such as frequencies, percentages, range, mean and standard deviation.

## RESULTS

The study included 53 caregivers with a mean age of 33.2  $\pm 9.2$  years; 81% ( $n=43$ ) were females. Average BMI of the caregivers was 25.5 ( $\pm 5$ ); 59% ( $n=31$ ) were normal

**Table 1.** Characteristics of the caregivers

	n = 53		
Variable	Average	SD	
Gender	n (%)		
Female	43 (81.1)		
Male	10 (18.8)		
Age (years)	33.0	±	9.0
Relationship to the patient	n (%)		
Mother	38 (71.7)		
Father	8 (15.0)		
Others (grandparents, siblings, aunts/uncles)	7 (13.2)		
Height (m)	1.58	±	0.1
Weight (kg)	69.0	±	12.0
BMI (kg/m <sup>2</sup> )	25.5	±	5.0
BMI classification	n (%)		
Normal <sup>1</sup>	31 (58.4)		
Overweight <sup>2</sup>	14 (26.4)		
Obesity <sup>3</sup>	8 (15.0)		

BMI, body mass index  
<sup>2</sup>Overweight BMI ≥25-29

<sup>1</sup>Normal BMI (18-24)  
<sup>3</sup>Obesity BMI ≥30

weight, whereas 26% ( $n = 14$ ) and 15% ( $n = 8$ ) of caregivers were overweight and obese, respectively (Table 1). Table 2 shows the amount (in grams) of macronutrients and fiber consumed by caregivers. On day 1 there was an average intake of  $1534 \pm 1393$  total calories. For day 2,  $1469 \pm 1276$  calories were consumed and on day 3,  $1901 \pm 1972$  calories. Male caregivers consumed a higher amount of macronutrients, whereas fiber consumption was similar for both genders. In regard to the percentage of adequacy of the recommended calories per day, data indicated that in the course of the 3 days caregivers covered an average between 66% and 82% of the recommended intake. Table 3 shows the adequacy of dietary macronutrients per day over the course of 3 days. Distribution of protein intake of  $14 \pm 5$  g for day 1,  $15.1 \pm 5$  g for day 2 and  $13.9 \pm 6$  g for day 3 can be shown. Carbohydrate intake was distributed on day 1 as follows:  $55 \pm 19$  g, on day 2 consumption was  $56 \pm 14$  g and on day 3 was  $57 \pm 17$  g. Distribution of fat intake on day 1 was  $31 \pm 16$  g, on day 2 the consumption corresponded to  $29 \pm 12.6$  g and on day 3,  $28 \pm 16$  g. Comparing macronutrient consumption between males and females, no significant changes were observed in the distribution.

Upon analyzing the feeding process in relation to mealtimes (Table 4), 86% of caregivers had breakfast, only 28% had lunch and 32% had dinner (average 3 days). The source of food during the 3 days of follow-up showed

that 46% of caregivers bought their breakfast, 21% ate it at home and 17% received it as a gift.

In regard to the food, 55% bought their food, 24% received it as a gift and 3% brought it from home. For dinner, 38% bought it, 23% received it as a gift and 6% brought it from home.

In the survey conducted to describe the characteristics of the feeding process of caregivers (Table 5), it was found that 81% were still hungry, 16% brought food into the hospital, 30% kept food in the hospital during their stay, 71% ate from the patient's tray, 37% had problems getting food and 82% felt that they departed from their usual diet during their relative's stay in the hospital.

## DISCUSSION

The results agree with what has been described in several studies where inpatient caregivers/patients are primarily female, family members and, when the patient is a child, mothers are often the primary caregivers.<sup>9</sup> It is known that the prevalence of overweight and obesity in Mexico is 71.2%.<sup>10</sup> The prevalence of obesity is 32.4% and 38.8% overweight. In this study, average BMI for males and females demonstrated 41% overweight/obesity. This suggests that it is a result due to the chronic traumatic experience of caring for a sick child. This is relevant not only for the well-being of caregivers because there is a relation between caregiver feeding and the food consumption pattern of children.<sup>12</sup>

In 2006, the Food and Agricultural Organization (FAO) defined food security when persons have, at all times, physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences in order to lead an active and healthy life.

According to this study, we can state that caregivers do not have food security during their stay in the hospital because they eat what they can afford and at the moment they are able.<sup>13</sup>

Although the Mexican diet has a low rate of diversity maintenance, in the event of hospitalization food options are reduced. The recommended intake for an average Mexican adult is 2500 calories. However, according to the Encuesta de Ingresos y Gastos de los Hogares (ENIGH, 1998), there is an actual average consumption of 3108 calories per day per person, 24.3% higher than recommended. However, during the hospitalization of their

**Table 2.** Calories, macronutrients and fiber consumption of the caregivers

	<i>n</i> = 53 Day 1	<i>n</i> = 50 Day 2	<i>n</i> = 40 Day 3
Variable	Average/SD	Average/SD	Average/SD
Calories (kcal/day)	1534.0 ± 1393.8	1469.1 ± 1276.6	1901.0 ± 1972.0
Protein (g/day)	46.0 ± 28.0	44.0 ± 21.0	52.5 ± 28.8
Carbohydrates (g/day)	240.2 ± 329.0	232.0 ± 304.0	302.0 ± 441.0
Fat (g/day)	44.0 ± 30.2	41.0 ± 28.0	54.9 ± 65.0
Fiber (g/day)	12.1 ± 11.0	8.0 ± 5.0	11.2 ± 11.0
Recommended calories (%)	66.3 ± 56.0	64.0 ± 54.0	82.0 ± 78.0
Males	<i>n</i> = 10	<i>n</i> = 8	<i>n</i> = 5
Calories (kcal/day)	1755.9 ± 1639.8	1875.0 ± 1542.0	2774.3 ± 3291.0
Protein (g/day)	57.0 ± 41.0	45.0 ± 22.0	54.8 ± 17.0
Carbohydrates (g/day)	279.0 ± 379.0	343.0 ± 401.0	533.0 ± 810.0
Fat (g/day)	46.0 ± 38.0	37.0 ± 11.0	46.4 ± 22.7
Fiber (g/day)	11.7 ± 8.0	9.0 ± 4.0	10.0 ± 10.0
Recommended calories (%)	66.0 ± 55.0	65.0 ± 46.0	98.0 ± 120.4
Females	<i>n</i> = 43	<i>n</i> = 42	<i>n</i> = 35
Calories (kcal/day)	1482.0 ± 1347.0	1391.0 ± 1226.1	1777.0 ± 1748.8
Protein (g/day)	43.0 ± 23.9	44.0 ± 21.0	52.0 ± 30.2
Carbohydrates (g/day)	231.0 ± 321.5	211.0 ± 283.0	269.0 ± 370.0
Fat (g/day)	44.0 ± 28.0	42.0 ± 30.9	56.1 ± 69.0
Fiber (g/day)	12.1 ± 12.1	8.0 ± 5.0	11.0 ± 11.0
Recommended calories (%)	66.0 ± 57.0	64.0 ± 56.0	79.0 ± 73.0

The recommendation for the Mexican population is 2500 kcal/day.

**Table 3.** Adequacy of the consumption of macronutrients of the caregivers

	<i>n</i> = 53 Day 1	<i>n</i> = 50 Day 2	<i>n</i> = 40 Day 3
Variable	Average/SD	Average/SD	Average/SD
Protein (g)	14.0 ± 5.0	15.1 ± 5.0	13.9 ± 6.0
Carbohydrates (g)	55.0 ± 19.0	56.0 ± 14.0	57.0 ± 17.0
Fat (g)	31.0 ± 16.0	29.0 ± 12.6	28.0 ± 16.0
Males	<i>n</i> = 10	<i>n</i> = 8	<i>n</i> = 5
Protein (g)	16.0 ± 6.0	12.9 ± 7.2	14.1 ± 7.0
Carbohydrates (g)	56.0 ± 18.0	59.0 ± 22.0	59.0 ± 19.6
Fat (g)	26.0 ± 12.9	28.0 ± 20.0	24.0 ± 10.7
Females	<i>n</i> = 43	<i>n</i> = 42	<i>n</i> = 35
Protein (g)	14.2 ± 5.0	15.5 ± 5.0	13.8 ± 6.0
Carbohydrates (g)	54.0 ± 19.0	55.0 ± 13.0	57.0 ± 17.2
Fat (g)	32.3 ± 16.0	29.0 ± 10.0	28.0 ± 16.0

The recommendation for the Mexican population with regard to the total energy value is: Carbohydrates 55-63%, Proteins 12-15%, Lipids 25-39%.

**Table 4.** Number of meals and origin of the food

<i>Number of meals eaten</i>	<i>(%)</i>
Breakfast	86
Lunch	28
Dinner	32
<i>Origin of the food</i>	<i>(%)</i>
Breakfast	
At home	21
Bought	46
Gift	17
Lunch	
At home	3
Bought	55
Gift	24
Dinner	
At home	6
Bought	38
Gift	23

Data are the average of 3 days follow-up.

**Table 5.** Characteristics of eating during the hospitalization event

<i>Characteristics</i>	<i>n=53</i>	<i>(%)</i>
Suffers from hunger	43	81
Brings food to the hospital	9	16
Saves food from the hospital	16	30
Eats from the patient's food tray	38	71
Problems acquiring food	20	37
Eats in the usual manner	10	18

children, caregivers had a lower daily consumption than recommended and, although it tended to increase with the passing days, it did not reach the recommended daily caloric allowance.

Regarding the macronutrients, caregivers had an average consumption of 348 g carbohydrates, less than the recommended intake (432 g). Their daily, per person consumption of protein was 83.6 g and 85.8 g fat.

Both protein and fat were above the recommended standards (80 g protein, 50 g fat per day per adult). Fats were the most consumed nutrient and the one which significantly exceeded the daily recommendation.<sup>10</sup> This fact demonstrates that during periods of hospitalization of their children, family members have a poor and unbalanced diet. In an ideal health system, basic needs of care-

givers must be considered as an important element in the care process.

The food survey found that most caregivers are hungry during their hospital stay. They often eat from the patient's tray and they consider that they do not eat as when they are in their homes. This is consistent with that described by Flores et al. who suggest the hypothesis that as the caregiver leaves his patient, guilt and anxiety increase. The result of this dependence is that the caregiver's diet is not appropriately fulfilled or, alternatively, under inappropriate conditions, either in the hospital or in the street, which may affect the health of the caregiver.<sup>14</sup>

Several studies have been conducted in regard to caregivers. They mainly described how they and their families are affected by a hospitalization event, both emotionally and in their lifestyle, but there is little research about caregivers staying in the hospital environment and the difficulties that arise in this. From the information generated, strategies may arise to reduce physical, social and emotional stress of caregivers.<sup>15</sup>

The health system is responsible for creating an environment in which patients and their families receive preventive care and treatment to minimize the biological, emotional and social impact caused by illness. This should be quality care particularly in regard to cancer, especially in children, because it is often devastating. The burden placed on caregivers not only affects them, but also affects the patient.<sup>16</sup>

Caregivers are generally satisfied with the care provided and only sometimes satisfied with the education they receive for managing the disease. However, they tend to rate the care provided to them and the conditions in hospitals as not always satisfactory, making it difficult to carry out their most basic needs, resulting in stress and anxiety.<sup>17</sup>

The limitations of this study lie in the lack of parameters for the comparison of food consumption of caregivers with the reality of the Mexican population, along with a limited sample size. In addition, the study only examined caregivers of cancer patients, so the results may not necessarily represent what occurs with other caregivers. However, the results obtained allow us to be aware of a community problem related to patient support and which requires a greater number of studies to establish mechanisms to improve their conditions.

## ACKNOWLEDGMENTS

We acknowledge the scholarship program (Programa de Becas de Inicio a la Investigación) (PROBEI) January-December 2012 for support to L.N. Diana Ávila Montiel and Valeria Ortega Martín.

*Correspondence:* Dr. Juan Garduño Espinosa  
Departamento de Investigación en Salud Comunitaria  
Hospital Infantil de México Federico Gómez  
México, D.F., México  
E-mail: [juan.gardunoe@gmail.com](mailto:juan.gardunoe@gmail.com)

## REFERENCES

1. World Health Organization. Cause of death and burden of disease: global epidemic of chronic noncommunicable diseases. Report World Health Statistics 2006. p. 14. Available at: [http://www.who.int/gho/publications/world\\_health\\_statistics/whostat2006\\_erratareduce.pdf](http://www.who.int/gho/publications/world_health_statistics/whostat2006_erratareduce.pdf)
2. Instituto Nacional de Estadística y Geografía. Estadísticas a propósito del Día Mundial Contra el Cáncer. México: Instituto Nacional de Estadística y Geografía; 2008.
3. Covinski KE, Goldman L, Cook EF, Oye R, Desbiens N, Redding D, et al. The impact of serious illness on patients' families. SUPPORT Investigators. Study to Understand Prognoses and Preferences for Outcomes and Risks of Treatment. JAMA 1994;272:1839-1844.
4. Roca R, Úbeda I, Fuenelsaz C, López R, Pont A, García L, Pedreny R. Impacto del hecho de cuidar en la salud de los cuidadores familiares. Atención Primaria 2000;26:53-67.
5. Sociedad de Enfermería de Atención Primaria de la Región de Murcia (SEAPREMUR). La salud por la integridad. Auto-cuidado. Available at: [http://www.seapremur.com/La\\_salud\\_por\\_la\\_integridad/La\\_salud\\_por\\_la\\_integridad.htm](http://www.seapremur.com/La_salud_por_la_integridad/La_salud_por_la_integridad.htm)
6. Flores-Antigüedad ML, Cano-Caballero Gálvez MD, Caracuel-Romero A, Castillo-Franco A, Mezcua-Fernández A, Osorio-Areu MV, et al. La alimentación del acompañante del paciente hospitalizado. Enferm Clin 2000;10:3-8.
7. Given BA, Charles CW. Health promotion for family caregivers of chronically ill elders. Annu Rev Nurs Res 1998;16:197-217.
8. Secretaría de Salud. Modificación a la Norma Oficial Mexicana 015-SSA2-1994, para la prevención, tratamiento y control de la diabetes mellitus en la atención primaria para quedar como Norma Oficial Mexicana 015-SSA2-1994, para la prevención, tratamiento y control de la diabetes. Available at: <http://www.salud.gob.mx/unidades/cdi/nom/m015ssa24.html>
9. Navaie-Waliser M, Feldman PH, Gould DA, Levine C, Kuerbis AN, Donelan K. When the caregiver needs care: the plight of vulnerable caregivers. Am J Public Health 2002;92:409-413.
10. Instituto Nacional de Estadística y Geografía. Encuesta Nacional de Ingresos y Gastos de los Hogares, 2006. Available at: <http://www.inegi.org.mx/est/contenidos/proyectos/encuestas/hogares/regulares/enigh/enigh2006/default.aspx>
11. Patrick H, Nicklas TA, Hughes SO, Morales M. The benefits of authoritative feeding style: caregiver feeding styles and children's food consumption patterns. Appetite 2005;44:243-249.
12. Organización de las Naciones Unidas para la Agricultura y la Alimentación (FAO). El Derecho a la Alimentación en la Práctica. Aplicación a Nivel Nacional; 2006. Available at: <http://www.fao.org/docrep/016/ah189s/ah189s.pdf>
13. Instituto Nacional de Salud Pública. Encuesta Nacional de Salud y Nutrición, ENSANUT, 2012. Available at: [http://ensanut.insp.mx/resultados\\_principales.php](http://ensanut.insp.mx/resultados_principales.php)
14. Grunfeld E, Coyle D, Whelan T, Clinch J, Reyno L, Earle CC, et al. Family caregiver burden: results of a longitudinal study of breast cancer patients and their principal caregivers. CMAJ 2004;170:1795-1801.
15. De la Huerta R, Corona J, Méndez J. Evaluación de los estilos de afrontamiento en cuidadores primarios de niños con cáncer. Neurol Neurocir Psiquiat 2006;39:46-51.
16. Penson RT, Dignan FL, Canellos GP, Picard CL, Lynch TJ Jr. Burnout: caring for the caregivers. Oncologist 2000;5:425-434.
17. Iconomou G, Vagenakis AG, Kalofonos HP. The informal needs, satisfaction with communication, and psychological status of primary caregivers of cancer patients receiving chemotherapy. Support Care Cancer 2001;9:591-596.

[www.medigraphic.org.mx](http://www.medigraphic.org.mx)