

# Food profile of heart transplants in a Brazilian transplantation center - Nursing performance in this scenario

**RESUMO** | Objetivo- Descrever o perfil alimentar de pacientes pós transplante cardíaco (TC) tardio de um centro transplantador brasileiro. Método- Estudo observacional transversal com delineamento descritivo. O estudo ocorreu em uma instituição de ensino público de Minas Gerais. A coleta de dados ocorreu no período de 2017 a 2019. Resultados-. A amostra do estudo foi composta por 62 indivíduos transplantados entre os anos de 2006 a 2016. Aproximadamente 63% era do sexo masculino. A média de idade foi de 46,53 anos. O consumo de carboidratos e gorduras foi adequado em 46,77% e 59,68% da amostra, respectivamente. Já o consumo de proteínas foi acima do recomendado em 77,42% e o consumo de fibras abaixo do recomendado em 79,03%. Conclusão- Houve a predominância do sexo masculino. Os indivíduos apresentaram um consumo adequado somente de carboidratos e gorduras. Não houve na literatura estudos descrevendo a atuação do enfermeiro no processo de nutrição neste cenário.

**Descritores:** Transplante de coração, Dieta, Necessidades nutricionais, Enfermagem.

**ABSTRACT** | Objective- To describe the dietary profile of patients after late heart transplantation (HT) from a Brazilian transplant center. Method- Cross-sectional observational study with descriptive design. The study took place in a public education institution in Minas Gerais. Data collection took place from 2017 to 2019. Results-. The study sample consisted of 62 individuals transplanted between 2006 and 2016. Approximately 63% were male. The mean age was 46.53 years. The consumption of carbohydrates and fats was adequate in 46.77% and 59.68% of the sample, respectively. The consumption of proteins was above the recommended in 77.42% and the consumption of fibers below the recommended in 79.03%. Conclusion- There was a predominance of males. The individuals presented an adequate consumption of only carbohydrates and fats. There were no studies in the literature describing the role of nurses in the nutrition process in this scenario.

**Keywords:** Heart transplantation, Diet, Nutritional requirements, Nursing.

**RESUMEN** | Objetivo- Describir el perfil dietético de pacientes después de un trasplante cardíaco (TC) tardío de un centro de trasplante brasileño. Método- Estudio observacional transversal con diseño descriptivo. El estudio se llevó a cabo en una institución de educación pública en Minas Gerais. La recolección de datos se llevó a cabo de 2017 a 2019. Resultados-. La muestra del estudio estuvo compuesta por 62 individuos trasplantados entre 2006 y 2016. Aproximadamente el 63% eran hombres. La edad media fue de 46,53 años. El consumo de carbohidratos y grasas fue adecuado en el 46,77% y 59,68% de la muestra, respectivamente. El consumo de proteína estuvo por encima del nivel recomendado en un 77,42% y el consumo de fibra por debajo del nivel recomendado en un 79,03%. Conclusión- Hubo predominio del sexo masculino. Los individuos presentaron un consumo adecuado de solo carbohidratos y grasas. No hubo estudios en la literatura que describieran el papel del enfermero en el proceso de nutrición en este escenario.

**Palabras claves:** Trasplante de corazón, Dieta, Necesidades nutricionales, Enfermeira.

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Recebido em: 27/01/2022  
Aprovado em: 20/04/2022

## INTRODUCTION

HT is still the therapeutic option in patients with advanced HF and refractory to optimized treatment.<sup>1</sup> According to the Brazilian Transplant Registry linked to the Brazilian Association of Organ Transplantation (ABTO - Associação Brasileira de Transplante de Órgãos), HT in Brazil has shown steady growth since 2011 and, in 2019, there was an increase of 6%, with a forecast of progression for the coming years.<sup>2</sup>

Patients with advanced HF and candidates for HT need rigorous follow-up by a multidisciplinary team, such as clinical, laboratory, immunological, hemodynamic, social, psychological, nutritional and nursing assessments.<sup>3</sup> In the composition of the team, there is the professional nurse, in which he must perform specific assistance with quality and scientific technical mastery, evaluating in an objective and directed way the needs of the patient and family, in addition to guidelines for self-care in the process,<sup>3,4</sup> among them the action on the affected basic human need for nutrition.

The theory of Basic Human Needs (BHN), developed by nurse Horta in 1979, being widely applied today, can be understood as states of tension resulting from homeodynamic imbalances related to vital phenomena, common to all individuals and which are relevant at the psychobiological, psychosocial and psychospiritual level. The psychobiological level includes the BHN of nutrition.<sup>5</sup>

Studies indicate that dietary factors are significantly associated with the incidence and mortality from cardiovascular disease and other non-communicable diseases, it is estimated that 33% to 40% of the incidence of these diseases can be attributed to an inadequate diet.<sup>6,7</sup> A nutrient-poor diet is an important risk factor for modifiable cardiovascular disease and represents a critical target of cardiovascular prevention efforts.<sup>8</sup>

Health education is one of the nurses' attributions in the process of caring for the health of individuals. According to the Code of Ethics for Nursing Professionals, Art. 70, nurses are expected to act as educators for other members of the nursing team, as well as for their clients.<sup>9</sup> This educational process makes it possible to promote health and prevent several diseases that are closely related to diet, such as hypertension, diabetes, among other comorbidities.<sup>10</sup>

Diet influences the results after the HT, especially with regard to complications, in addition, there is a limitation of studies on the participation of nurses in this process.<sup>11</sup> It is already known that dietary advice after HT aims to reduce the incidence of metabolic syndrome and vascular graft disease, factors related to loss of graft function, and should be associated with physical activity to change lifestyle habits.<sup>4</sup>

The present work, after identifying the gap in the literature on the absence of studies on the food consumption of individuals after the HT in the medium and long term and the role of nursing on the subject, has as main objective to describe the dietary profile of individuals after late HT of a Brazilian transplant center, in addition to identifying the role of nurses in the face of the basic human need for nutrition after HT and the adequacy of macronutrients according to nutritional recommendations in the literature.

## METHOD

This is a cross-sectional observational study with a descriptive design of the dietary profile of heart transplant recipients. The study took place in a public education institution in Minas Gerais, which is also a leading Bra-

zilian and world transplant center in terms of number of transplants<sup>2,12,13</sup> during the completion of the first author's dissertation. The HT service of the institution under study started in 2006 and, by the end of 2016, it had already performed 241 transplants with a heart retransplantation among these procedures. Individuals who transplanted in this period (2006 to 2016) were invited to participate in the study and to fill out the forms pertaining to this research. Data collection was carried out from December 2017 to 2019, as those individuals who were transplanted until December 2016 could only take part in the work from December 2017, according to the study exclusion criteria. Data analysis was carried out in 2019. The time cut-off for choosing the sample was chosen because it allows the analysis of food profiles of different individuals with different times of HT. The making of this article was carried out between December 2021 and January 2022.

For the study, a convenience sample of individuals belonging to the macro-regions of Minas Gerais was used, who were regularly seen at the cardiology outpatient clinic of the teaching institution and who had performed their procedure at this institution. As they attended the consultations, they were invited to participate in the study.

Patients who underwent transplantation between 2006 and 2016 who agreed to participate and aged 18 years or older were included in the study. Patients who died within one year of transplantation during the analyzed period and those who did not adequately complete the dietary survey as instructed were excluded from the study. After applying the exclusion criteria, a sample of 62 individuals was obtained.

For data collection, individuals who agreed to participate in the study, signed the Free and Informed Consent Form and received a food survey to be carried out at their residence for three

alternate days, one of which should be atypical (weekend). Data collection was carried out for a period of 18 months. Guidance was provided, individually, on the correct way to complete the food survey and on certain dates so that it could be done at home by the participants.

For the analysis of the food survey, the foods ingested by the patients were grouped into macronutrients such as carbohydrates, proteins, fats and fibers, using the Brazilian Guideline on Dyslipidemia and Prevention of Atherosclerosis of the year 2017 as a reference,<sup>14</sup> to estimate optimal consumption.

Ethical precepts of research involving human beings were followed, according to Resolution 466/2012 of the National Health Council and its complementary ones, being approved by the Research Ethics Committee of the institution according to CAAE registration: 60003816.1.0000.5149.

For data organization and analysis, a database was built in Microsoft Office Excel Software (2019 version). A descriptive analysis was performed with absolute and relative frequency data. The caloric intake of macronutrients was performed using the Dietpro® software version 5.8, using the Brazilian food composition table TACO.

## RESULTS

Approximately 63% of the sample in this study was male. The mean age among individuals was 46.53 with a standard deviation of 12.4 years and a median age of the recipient at the HT of 48 years with a minimum age of 24 years and a maximum of 67 years.

The etiology for HF, which led to HT, most prevalent in this study was Chagas' cardiomyopathy (41.94%), followed by idiopathic cardiomyopathy (29.03%) and ischemic cardiomyopathy (19.35%) and, finally, other cardiomyopathies (9.68%) less prevalent.

Most patients, 58.06%, in this stu-

dy, had between one and five years of heart transplantation and 20.97% had more than five years of transplantation during the analyzed period, as shown in table 1.

From the analysis of the macronutrients consumed, it was possible to identify that the average consumption in grams of carbohydrates was 189.32g, of proteins 65.30g, of fats 19.72g. Therefore, the percentage of consumption of carbohydrates corresponds to 51.76% of the total caloric value, proteins corresponds to 18.20%, fats corresponds to 30.4% of the total caloric value.

Table 2 shows the distribution of patients in this study, according to the consumption of macronutrients according to the recommendations presented by the Brazilian Guideline on Dyslipidemia and Prevention of Atherosclerosis of 2017.<sup>14</sup> The recommendation by the guideline establishes reference values for macronutrient consumption

of individuals with LDL-c (Low Density Lipoprotein-cholesterol) within the normal range, less than 70 mg/dl, and without comorbidities. These are recommended values for the general population. Therefore, the recommended consumption of carbohydrates is 50-60% of the total caloric value, 15% of protein, 25-35% of fat and 25g of fiber.

It is observed that, in this study, the consumption by most individuals within the recommended by the guideline was only carbohydrates and fats, corresponding respectively to 46.77% and 59.68% of the sample. Already the consumption of proteins was above the recommended in 77.42% and the consumption of fibers below the recommended in 79.03%.

## DISCUSSION

This was the first Brazilian study to address medium and long-term food consumption in heart transplant

**Table 1. Clinical characteristics of HT recipients from a public institution in Minas Gerais, transplanted from 2006 to 2016 (n=62).**

VARIABLES	n	%
<b>Sex</b>		
Female	23	37,10
Male	39	62,90
<b>Age</b>		
From 18 to 60 years old	56	90,32
Over 60 years old	6	9,68
<b>Etiology for Transplantation</b>		
Chagas cardiomyopathy	26	41,94
Idiopathic cardiomyopathy	18	29,03
Ischemic cardiomyopathy	12	19,35
Others	6	9,68
<b>Transplant time</b>		
Less than 1 year	13	20,97
1 to 5 years	36	58,06
More than 5 years	13	20,97

Frequency (%)

Source: Research data 2019

patients. Despite a small sample, the clinical data presented by this study corroborate data from The International Society for Heart & Lung (ISHLT), which shows a higher prevalence of males among HT recipients and similar age between studies.<sup>12,13</sup>

Khush et al., (2019)<sup>13</sup>, in a study with a large sample and which analyzes data from more than 450 transplant centers around the world, points out that the individuals in their study have a minimum age of 25 years and a maximum of 68 years, values comparable to those of this study in which the participants were aged at least 24 years and at most 67 years.

According to the 2019 ISHLT registration,<sup>13</sup> non-ischemic cardiomyopathy, chagasic cardiomyopathy and idiopathic cardiomyopathy correspond to 51% of the indications for transplantation, followed by ischemic cardiomyopathy equivalent to 32%.<sup>13</sup> In this study, nonischemic, chagasic and idiopathic cardiomyopathies are equivalent to 70.97% of the sample, which is higher than the international data for 2019.<sup>13</sup> And, in this study, Chagas cardiomyopathy remains prominent among non-ischemic cardiomyopathies.

In Brazil, Chagas' cardiomyopathy is the third leading cause of HT indication, preceded by dilated and ischemic cardiomyopathies. Individuals affected by Chagas' cardiomyopathy have a poor prognosis compared to other etiologies.<sup>3</sup> The state of Minas Gerais is considered one of the states with the highest prevalence of endemic Chagas disease,<sup>15</sup> consistent with data from the present study, given that Chagas' cardiomyopathy was the most prevalent, precisely because the sample is part of this state..

Overall post-HT survival improved with time, reaching the average survival of adult heart transplant recipients between 2002 and 2009 of 12.5 years, according to the literature.<sup>13</sup> Khush et al. (2019) points to an association be-

**Table 2. Distribution of patients, HT recipients, according to macronutrient consumption in relation to the ideal consumption recommendations by the Brazilian Dyslipidemia and Atherosclerosis Prevention Guideline of 2017 14 (n=62). Minas Gerais. Brazil.**

Variables	Carbohydrates n (%)	Proteins n (%)	Fats n (%)	Fibers n (%)
Bellow	25 (40,32%)	14 (22,58%)	12 (19,35%)	49 (79,03%)
Ideal	29 (46,77%)	-	37 (59,68%)	0
Above	8 (12,91%)	48 (77,42%)	13 (20,97%)	13 (20,97%)

Frequency (%)

Source: Research data 2019

tween age and survival. The older the recipient, the lower the long-term survival of the individual, and the older the donor, there is also this association of lower survival.<sup>13</sup>

According to OTTO et al.<sup>16</sup> (2016) food inadequacy is the main cause of cardiovascular mortality in Brazil. Protein consumption helps to reduce cardiovascular risk, in addition to acting in tissue maintenance and metabolism, but it is known that excess protein in the diet can cause diseases such as atherosclerosis and kidney diseases.<sup>7,18</sup>

Already the consumption of fiber in the diet within the recommended is necessary, as they help in good gastrointestinal performance, in addition to contributing to a lower prevalence of coronary heart disease, stroke and prevent the onset of diabetes, as fiber contributes to the slow digestion and absorption of carbohydrates.<sup>18</sup>

Guidance on feeding after HT aims to reduce complications such as vascular graft disease and metabolic syndrome.<sup>4</sup> In addition to food adequacy that should be stimulated and associated with physical activity for a healthy lifestyle.<sup>4,14</sup>

Solid organ transplant patients such as heart, kidney, liver are affected with a high prevalence of metabolic disorder in the later context, including diabetes, obesity and dyslipidemia. Therefore, dietary interventions are effective in controlling these chronic diseases.<sup>11</sup>

Souza (2021)<sup>19</sup>, suggests in his work that the performance of a multidisciplinary

team specialized in transplantation is necessary and that health education takes place. This same author points out that despite evidence about the impact of multidisciplinary work in the HT, it is possible to perceive in many centers the absence of some professionals who should be involved in the process.

There are no studies describing the role of nurses in the nutrition process after late HT, which includes the medium to long-term periods, however, it is known that nutrition is a basic human need, described by Horta and that it is the role of nursing.<sup>5</sup>

One of the limitations of the study is the type of study that assesses the dietary profile in a short period of time. Therefore, cohort studies with longer evaluation time are suggested to better elucidate nutritional issues and their influence on heart transplant patients in the medium and long term. The food survey collection instrument was a limiting factor in obtaining data, as questionnaires were identified with incomplete completion, withdrawal from filling and loss of filling by the study participants, in addition to the lack of questionnaires for nutritional assessment validated in Brazil.

## CONCLUSION

It is concluded that the evaluated sample is composed of heart transplant patients with a predominance of males, mean age of 46.53 years and etiology



of Chagas' HF. The individuals presented a dietary pattern with adequate consumption of carbohydrates and fats, but a high consumption of proteins and low consumption of fibers. Dietary interventions contribute to the control of metabolic disorders that may arise in the later context of HT. The professional nurse, even having theoretical bases of

action on the subject, since nutrition is a basic human need and, even supported by current legislation in the process of education and health promotion, there is still a lack of studies describing the participation of nurses in the nutrition process after late HT.

It is necessary for nurses to take ownership of their attribution intrinsic

to their training, health education, as provided in the code of ethics of their profession and to outline strategies, so that health promotion to the transplanted population occurs effectively and changes to healthier attitudes occur in their new health context.

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