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NUTRITIONAL STATUS AND QUALITY OF LIFE OF CANDIDATES FOR HEART TRANSPLANTATION

Estado nutricional e qualidade de vida de pacientes candidatos a transplante cardíaco

Estado nutricional y calidad de vida de pacientes candidatos al trasplante cardíaco

Luana Najara Ferreira Chaves
University of Fortaleza (*Universidade de Fortaleza - UNIFOR*) - Fortaleza (CE) - Brazil
Dr. Carlos Alberto Studart Gomes Hospital (*Hospital de Messejana Dr. Carlos Alberto Studart Gomes*) - Fortaleza (CE) - Brazil

Daniele Maria de Oliveira Carlos
University of Fortaleza (*Universidade de Fortaleza - UNIFOR*) - Fortaleza (CE) - Brazil
Dr. Carlos Alberto Studart Gomes Hospital (*Hospital de Messejana Dr. Carlos Alberto Studart Gomes*) - Fortaleza (CE) - Brazil

ABSTRACT

Objective: To assess the nutritional status and quality of life of candidates for heart transplantation. **Methods:** Quantitative descriptive study of candiates for heart transplantation attending the outpatient clinic of a Heart Failure and Transplant Center (HFTC) in Fortaleza, Ceará, Brazil. Interviews, consultations and medical records were used to collect data on weight, height, Body mass index (BMI), arm circumference (AC), arm muscle circumference (AMC), triceps skinfold (TS) and clinical data on the underlying disease. Questionnaires addressing socioeconomic data, lifestyle and dietary frequency and the World Health Organization Quality of Life-WHOQOLBref were used. Descriptive statistics and absolute and relative frequencies were used. Continuous variables were tested using Pearson's correlation coefficient. **Results:** Participants' mean age was 50.64±12.45 years and 57% (n=27) were men. As for nutritional status, 47.22% (n=17) of the adults were overweight and 54.55% (n=6) of the older people were at normal weight. In addition, adults presented normal AC, AMC and TS, with 52.78% (n=19), 88.82% (n=32) and 36.11% (n=13), respectively. The older people also presented normal AC and AMC, both with 81.82% (n=9). Quality of life (QoL) was satisfactory (fair) according to the mean of the domains. **Conclusion:** The patients presented normal nutritional status and/or overweight and a quality of life ranging from fair to good. The variations in the NS and QoL depend on the life stage and on the social/family support they receive, which constitute positive determinants even in the presence of heart disease.

Descriptors: Heart Failure; Nutritional Status; Quality of Life; Heart Transplantation.

RESUMO

Objetivo: *Avaliar o estado nutricional e a qualidade de vida de pacientes candidatos a transplante cardíaco.* ***Métodos:*** *Estudo quantitativo e descritivo, com pacientes candidatos a transplante cardíaco atendidos no ambulatório de uma Unidade de Transplante e Insuficiência Cardíaca (UTIC) em Fortaleza, Ceará, Brasil. Coletou-se, através da entrevista, do atendimento e do prontuário, dados de peso, estatura, índice de massa corporal (IMC), circunferência braquial (CB), circunferência muscular do braço (CMB), dobra cutânea tricipital (DCT) e dados clínicos sobre a patologia de base. Aplicaram-se questionários de perfil socioeconômico, estilo de vida, frequência alimentar e qualidade de vida versão World Health Organization Quality of Life - WHOQOLBref. Utilizou-se estatística descritiva e frequências absoluta e relativa. As variáveis contínuas foram testadas através do coeficiente de correlação de Pearson.* ***Resultados:*** *A idade média foi de 50,64±12,45 anos e 57% (n=27) eram do sexo masculino. Na avaliação do estado nutricional (EN), 47,22% (n=17) dos adultos tinham sobrepeso e 54,55% (n=6) dos idosos eram eutróficos. Além disso, os adultos apresentaram-se eutróficos para CB, CMB e DCT, com 52,78% (n=19), 88,82% (n=32) e 36,11% (n=13), respectivamente. Os idosos também estavam eutróficos para CB e CMB, ambos com 81,82% (n=9). A qualidade de vida (QV) mostrou-se satisfatória (regular) de acordo com a média dos domínios.* ***Conclusão:*** *Os pacientes apresentaram perfil nutricional de normalidade e/ou sobrepeso e uma qualidade de vida de regular a boa. As variações do EN e QV dependem da fase de vida e do apoio social/familiar que recebem, atuando como determinantes positivos, mesmo na presença da doença cardíaca.*

Descritores: *Insuficiência Cardíaca; Estado Nutricional; Qualidade de Vida; Transplante de Coração.*

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RESUMEN

Objetivo: *Evaluar el estado nutricional y la calidad de vida de pacientes candidatos al trasplante cardíaco.* ***Métodos:*** *Estudio cuantitativo y descriptivo con pacientes candidatos al trasplante cardíaco asistidos en el ambulatorio de una Unidad de Trasplante e Insuficiencia Cardíaca (UTIC) de Fortaleza, Ceará, Brasil. A través de la entrevista durante la asistencia y del historial clínico se recogieron los datos del peso, la estatura, el índice de masa corporal (IMC), la circunferencia braquial (CB), la circunferencia del músculo del brazo (CMB), el pliegue cutáneo tricipital (PCT) y los datos clínicos de la enfermedad de base. Se aplicaron cuestionarios sobre el perfil socioeconómico, el estilo de vida, la frecuencia alimentaria y la calidad de vida de la versión World Health Organization Quality of Life - WHOQOLBref. Se utilizó la estadística descriptiva y las frecuencias absoluta y relativa. Las variables continuas fueron testadas a través del coeficiente de correlación de Pearson.* ***Resultados:*** *La media de la edad fue de 50,64±12,45 años y el 57% (n=27) eran del sexo masculino. En la evaluación del estado nutricional (EN), el 47,22% (n=17) de los adultos tenían sobrepeso y el 54,55% (n=6) de los mayores eran eutróficos. Además de eso, los adultos se presentaron eutróficos para la CB, la CMB y el PCT con el 52,78% (n=19), el 88,82% (n=32) y el 36,11% (n=13) respectivamente. Los mayores también estaban eutróficos para la CB y la CMB, ambos con el 81,82% (n=9). La calidad de vida (CV) se mostró satisfactoria (regular) según la media de los dominios.* ***Conclusión:*** *Los pacientes presentaron el perfil nutricional de normalidad y/o sobrepeso y una calidad de vida de regular a buena. Las variaciones del EN y de la CV dependen de la fase de la vida y del apoyo social/familiar que reciben actuando como determinantes positivos incluso en la presencia de enfermedad cardíaca.*

Descriptores: *Insuficiencia Cardíaca; Estado Nutricional; Calidad de Vida; Trasplante de Corazón.*

INTRODUCTION

Heart transplantation (HT) is the treatment of choice for refractory heart failure (HF) despite the improvement in the life expectancy of these patients and the clinical treatment performed over the last decades. Several advances have been made in this area, including the incorporation of new surgical techniques, new immunosuppressants, new diagnostic methods and approaches in the early and late postoperative periods[1,2].

HF is defined as cardiac dysfunction that causes inadequate blood supply to meet tissue metabolic demands in the presence of normal venous return or with high filling pressures[2]. It is an important public health problem and has been considered a new epidemic associated with high morbidity and mortality rates. In Brazil, there is an increase in hospitalizations for heart disease, with HF being their main cause. It is the main cause of hospitalization in the older population over 65 years of age, accounting for 80% of hospitalizations. Due to the aging of the Brazilian population, there is a potential growth of patients at risk for or with HF[2,3].

The clinical progress of HF patients usually leads to a series of physiological changes, many of which directly influence nutritional status[4], which, in addition to being one of the multiple factors involved in the etiology of the disease, is related to progression and worse clinical outcomes in patients with HF[5].

Catabolism and hypermetabolism are worsened by the progression of the disease, which can lead to cardiac cachexia. Changes in nutritional status may also be caused by lower food intake and nutrient utilization[5,6]. Some of the alterations that occur in this condition and that influence food intake and acceptance are: alterations in the gastrointestinal tract, such as gastric compression and congested liver, which generate sensation of postprandial fullness; edematous bowel loops, which decreases absorptive capacity, mainly of proteins (a situation known as protein-losing enteropathy); and anorexia, nausea, dyspnea and fatigue[6].

Given that, patients frequently present with weight loss associated with a decrease in energy reserve and progressive loss of muscle mass. Weight loss may reach up to 20% involuntarily and muscle mass may reach 6% in six months. This muscle mass loss impairs mobility and functional capacity (FC), worsens the prognosis, and increases postoperative complications and mortality[4,6].

It can be said that HF has a major impact on the different spheres of patients' lives, with emotional, social and economic impairment and physical limitations. Thus, quality of life (QoL) will be impaired and the general context of daily life will be affected by the physical disability caused by the heart disease[7,8].

Given the above, the present study aimed to assess the nutritional status and quality of life of candidates for heart transplantation.

METHODS

This is a quantitative and descriptive research carried out in 2016 with candidates for heart transplantation served at the outpatient clinic of the Heart Failure and Transplantation Center (HFTC) of a reference hospital for the treatment of heart diseases in the city of Fortaleza, Ceará, Brazil.

The research universe was based on the survey of the consultations carried out in 2015, totaling an average of 120 patients served. The sample consisted of patients who attended the consultations during the data collection period (July to December 2016) and met the inclusion criteria, with 47 patients being included in the study.

The study included patients aged 20 years and older of both sexes followed up at the HFTC outpatient clinic who accepted to participate in the study by signing a Free Informed Consent Form. Patients with altered levels of consciousness and/or unable to provide data were excluded.

Data were collected through nutritional assessment, clinical data on the underlying disease and application of three questionnaires: socioeconomic and lifestyle questionnaire, food frequency questionnaire and quality of life questionnaire (World Health Organization Quality of Life – WHOQOLBref).

Nutritional status was assessed through measurements of weight, height, arm circumference (AC), mid-arm muscle circumference (MAMC), triceps skinfold (TS) and Body Mass Index (BMI). Weight was measured with the patient placed on the center of the digital scale (Tanita®) standing barefoot and wearing light clothes. Height was measured using a stadiometer (Standart Sanny®) with the patient standing erect on barefoot with the heels together, back straight and arms extended to the side of the body[6].

Weight and height were used to estimate BMI (weight/height^2). The interpretation of these data was based on the World Health Organization reference standards for adults: <18.5 kg/m² for underweight, 18.5 to 24.9 kg/m² for normal weight and >24.9 kg/m² for overweight, or obesity, for adult[9]. The analysis of the BMI of older adults was as follows: <22 kg/m² for underweight, 22 to 27 kg/m² for normal weight and >27 kg/m² for excess weight[10].

Arm circumference (AC) was measured using an inelastic measuring tape at the midpoint between the acromion of the scapula and the olecranon process of the ulna with the body relaxed. Measurements of triceps skinfold (TS) were obtained using a skinfold caliper (Standart Sanny®) considering the nearest millimeter[6]. AC and TS measures were used to determine the mid-arm muscle circumference (MAMC), which was determined using the formula: MAMC (cm) = AC (cm) – [0.314 x TS (mm)]. The interpretation of the AC, MAMC and TS measures was performed by estimating the percentage of adequacy of the variables[11].

The assessment of the clinical profile was carried out using the protocol for assessment of the heart transplantation candidate used in the HFTC outpatient clinic and adapted for use in the current research. In addition, patients' medical charts were also consulted to collect information on the disease, etiology, associated comorbidities and functional classification of HF.

The demographic profile of the patients was determined using a socioeconomic and lifestyle questionnaire was applied. It consists of an adaptation of the enrollment form used in the HFTC with questions related to lifestyle. The questionnaire assesses information on sex, age, origin, religion, occupation, income, education, and lifestyle – physical activity, smoking and drinking. Some of this information was also obtained from the medical charts.

Eating habits were assessed through interviews carried out with the patients. During the interviews, the food frequency questionnaire (FFQ) was used to collect qualitative information about the dietary intake pattern[12].

The assessment of dietary habits followed the parameters of the Brazilian Food Pyramid, with adequate servings as follows: three or more servings/day of fruits; three or more servings/day of vegetables; one serving/day of beans and oilseeds; one serving/day of meat and eggs; six servings/day of rice, bread, pasta, potato and cassava; three servings/day of milk, cheese and yogurt. Dietary intake was classified into adequate (daily intake) and inadequate (weekly/seldom/never). This information was collected through an interview with the patients[13].

Quality of life was assessed using a structured and standardized questionnaire, the short version of the World Health Organization Quality of Life (WHOQOLBref) in Portuguese[14,15], which also assesses the individuals' perception of the impact of diseases on their lives. The final version of the WHOQOL-Bref consists of 26 closed-ended questions. The first question addresses general quality of life, the second addresses satisfaction with health and the other 24 questions represent each of the 24 facets that make up the original instrument. These 24 questions are divided into four domains: physical (7 items), psychological (6 items), social relationships (3 items) and environment (8 items)[14].

Each domain was categorized into three levels of satisfaction (low, intermediate and high) for analysis[16]. This scale is categorized as follows: values between 0 and 40 are considered a region of dissatisfaction or that needs improvement; values of 41 to 69 correspond to the region of unclearness, or fair; and values above 70 indicate a region of success, i.e., a very good quality of life[17,18].

All the data are described using descriptive statistics (mean and standard deviation) and absolute and relative frequencies. The statistical treatment of the results was performed using the Pearson' correlation coefficient in the R-Studio® software. The results were presented in tables and graphs according to the study variables.

This research was approved by the Research Ethics Committee of the hospital where the research took place, with Approval No. 1.639.432. The study complied with Resolution 466/12 of the National Committee for Research Ethics (*Comissão Nacional de Ética em Pesquisa – CONEP*) of the National Health Council (*Conselho Nacional de Saúde – CNS*) and preserved the anonymity and privacy of the respondents.

RESULTS

The mean age of the study population was 50.64±12.45 years, with 75% (n=35) of the patients being under 59 years of age. That is, the participants were adults. Regarding sex, 57% (n=27) of the participants were men. As for education, occupation, income and origin, the results were: 63.82% (n=30) of the patients had completed up to primary education; 59.57% (n=28) did not work due to physical limitations associated with the underlying disease – these patients were not retired; and 55.32% (n=26) had a monthly income of only 1 minimum wage or less (Table I).

With regard to origin, 55% (n=26) of the participants were originally from the capital, Fortaleza, and only 11% (n=5) were from other states and came to the capital on the days of consultations or stayed for a few months for the treatment and/or stabilization of the disease (Table I).

Regarding lifestyle habits, although most of the participants did not smoke or drink, there was a significant proportion of ex-smokers (40.43%, n=19) and ex-drinkers (44.68%, n=21), which deserves to be considered. Of the patients assessed, only 10.64% (n=5) reported some type of physical activity, which may be justified by the physical limitation posed by the underlying disease (Table I).

As for the clinical diagnosis associated with HF, the prevalence of idiopathic cardiomyopathy and ischemic cardiomyopathy were predominant, each of them affecting 38.3% (n=18) of the participants. The main cardiovascular risk factors associated with the clinical diagnosis were: Systemic Arterial Hypertension (SAH), present in 57.45% (n=27) of the patients; family history of heart disease, found in 48.97% (n=23) of the participants; and acute myocardial infarction (AMI), present in 36.17% (n=17) of the study sample (Table I).

The main factors that decompensate HF were physical effort (64.91%, n=31) and SAH (23.68%, n=11). The duration of the diagnosis in most of the patients was 5 years (40.43%, n=19).

The analysis of the functional classification of HF showed that 59.57% (n=28) of the patients presented class II, but 40.53% (n=19) presented classes III and IV, which indicate the need for transplant. In all, 72.97% (n=34) of the patients had not been hospitalized in the last 12 months and had disease under control (Table I).

Table I - Demographic and clinical profile of candidates for heart transplantation in a reference hospital for the treatment of heart diseases in the city of Fortaleza, Ceará, 2016.

Data	Quantity	Frequency
Education		
Illiterate	3	6.38%
Primary education	27	57.44%
Secondary education	12	25.53%
Higher education	5	10.64%
Occupation		
Retired	18	38.30%
Working	1	2.13%
Not working	28	59.57%
Income		
≤ 1 wage	26	55.32%
1 to 2 wages	14	29.79%
3 to 4 wages	4	8.51%
> 4 wages	3	6.38%
Origin		
Capital: Fortaleza - Ceará	26	55.00%
Municipalities - Ceará	16	34.00%
Other states	5	11.00%
Lifestyle habits		
Non-smoker	28	59.57%
Ex-smoker	19	40.43%
Non-drinker	26	55.32%
Ex-drinker	21	44.68%
Clinical diagnosis		
Idiopathic dilated cardiomyopathy	18	38.30%
Ischemic cardiomyopathy	18	38.30%
Peripartum cardiomyopathy	5	10.64%
Cardiomyopathy due to valve disease	3	6.38%
Other (Chagas, alcoholic and hypertensive)	3	6.36%

Risk factors		
SAH	27	57.45%
Diabetes	9	19.15%
Previous AMI	17	36.17%
Kidney failure	3	6.38%
Family history	23	48.97%
Myocardial revascularization	7	14.89%
Heart surgery	12	25.53%
Valve replacement	1	2.13%
Dyslipidemia	11	23.40%
Menopause with hormone replacement	6	28.57%
Menopause without hormone replacement	10	50.0%
Physical activity	5	10.64%
Decompensation factors		
SAH	11	23.68%
Ischemia	2	3.30%
Arrhythmia	3	6.38%
Kidney failure	1	2.13%
Progression of underlying disease	8	16.46%
Physical effort	31	64.91%
Duration of HF		
< 6 months	4	8.51%
1 to 2 years	18	32.29%
2 to 3 years	6	12.77%
5 years	19	40.43%
HF functional classification		
Class I	0	0%
Class II	28	59.57%
Class III	17	36.17%
Class IV	2	4.26%
Hospitalization in the last 12 months		
No	34	72.97%
Yes	13	27.03%

HF: Heart failure; SAH: Systemic arterial hypertension; AMI: Acute Myocardial Infarction

The analysis of the nutritional status (NS) of the sample, considering the specific criteria for adults and older adults, showed that 74.99% (n=27) of the adult patients presented excess weight, mainly overweight 47.22% (n=17). As for older adults, 54.55% (n=6) were at normal weight, but there was a significant proportion of individuals with excess weight – 36.36% (n=4) (Table II).

AC, MAMC and TS measures were also analyzed according to the age classification for adults and older adults. Regarding AC, 52.78% (n=19) of the adults and 81.82% (n=9) of the older adults presented a higher prevalence of normal measures. As for MAMC, 88.89% (n=32) of the adults and 81.82% (n=9) of the older adults presented normal measures. Although normal TS measure was not predominant, there was a very significant number of individuals with normal measures – 36.11% (n=13) of the adults and 36.36% (n=4) of the older adults (Table II).

Table II - Nutritional status of candidates for heart transplantation according to Body Mass Index (BMI), Arm Circumference (AC), Mid-arm Muscle Circumference (MAMC) an Triceps Skinfold (TS) by age group. Fortaleza, Ceará, 2016.

Nutritional Status	Quantity	Frequency
BMI for adults		
Severe malnutrition	0	0.00%
Moderate malnutrition	1	2.78%
Mild malnutrition	1	2.78%
Normal weight	7	19.44%
Overweight	17	47.22%
Mild obesity	3	8.33%
Moderate obesity	3	8.33%
Severe obesity	4	11.11%
Total	36	100%
BMI for older adults		
Underweight	1	9.09%
Normal weight	6	54.55%
Overweight	4	36.36%
Total	11	100%
Adequacy of AC (%) – Adults		
Obesity	5	13.88%
Overweight	3	8.33%
Normal weight	19	52.78%
Mild malnutrition	5	13.88%
Moderate malnutrition	4	11.11%
Severe malnutrition	0	0.00%
Total	36	100%
Adequacy of AC (%) – Older adults		
Obesity	0	0.00%
Overweight	1	9.09%
Normal weight	9	81.82%
Mild malnutrition	0	0.00%
Moderate malnutrition	1	9.09%
Severe malnutrition	0	0.00%
Total	11	100%
Adequacy of MAMC (%) - Adults		
Normal weight	32	88.89%
Mild malnutrition	2	5.56%
Moderate malnutrition	2	5.56%
Severe malnutrition	0	0.00%
Total	36	100%
Adequacy of MAMC (%) – Older adults		
Normal weight	9	81.82%
Mild malnutrition	1	9.09%
Moderate malnutrition	1	9.09%
Severe malnutrition	0	0.00%
Total	11	100%
Adequacy of TS (%) – Adults		
Obesity	8	22.22%
Overweight	1	2.78%
Normal weight	13	36.11%
Mild malnutrition	6	16.67%
Moderate malnutrition	1	2.78%
Severe malnutrition	7	19.44%
Total	36	100%
Adequacy of TS (%) – Older adults		
Obesity	4	36.36%
Overweight	0	0.00%
Normal weight	4	36.36%
Mild malnutrition	0	0.00%
Moderate malnutrition	2	18.19%
Severe malnutrition	1	9.09%
Total	11	100%

The assessment of the food intake pattern through the application of the FFQ showed that the foods that presented daily adequate intake were: meats and eggs (66.12%, n=30) and rice, bread, pasta, potato and cassava (65.72%, n=31).

The main food groups that presented inadequate intake (weekly/seldom/never) were: milk, cheese and yogurt (87.75%, n=41), beans and oilseeds (87.36%, n=41), oils and fats (78.23%, n=37), sugar and sweets (81.97%, n=39), and fruits and vegetables (54.42%, n=26). The results obtained in the analysis of the frequency of intake of food groups can be associated with the analysis of the clinical outcomes of the disease or with the appearance of comorbidities related to noncommunicable diseases.

Quality of life was assessed based on the mean scores obtained in each domain assessed by the questionnaire. The physical domain exhibited the lowest score (54.56), which shows that this domain is more affected due to the physical limitation pose0d by the disease. The questions on quality of life questions, in general, were included in another domain to facilitate the understanding of the results. This domain was named self-rated quality of life domain. This domain presented the second lowest score in relation to the others (57.71), which reflects a fair satisfaction with quality of life in general. The domains that presented the highest mean scores were: psychological (65.02) and social relationships (67.73). These factors have an important impact on patients' self-esteem and, consequently, on quality of life. In this regard, the psychological domain and the social relationships domain contributed positively to having individuals rate their life as fair or good, even in the face of a heart disease (Table III).

Table III - Descriptive analysis of quality of life (QoL) domains in candidates for heart transplantation in a reference hospital for the treatment of heart diseases through descriptive analysis of the domains. Fortaleza, Ceará, 2016.

Domains	Mean	Standard Deviation	Coefficient of Variation	Minimum Value	Maximum Value	Amplitude	Scale (0 to 100)
Physical	12.73	2.28	17.88	7.43	16.57	9.14	54.56
Psychological	14.40	2.33	16.21	8.67	18.00	9.33	65.02
Social relationships	14.84	2.25	15.18	6.67	17.33	10.67	67.73
Environment	13.84	2.09	15.09	8.50	17.50	9.00	61.52
Self-rated QoL	13.23	3.11	23.49	6.00	20.00	14.00	57.71
General	13.71	1.90	13.87	8.15	16.92	8.77	60.71

Figure 1 presents the results of the mean scores obtained in each facet of questions, allowing for a more detailed analysis. The analysis of the facets showed that 84.04% (n=39) of the patients are dependent on the use of medications and/or need a companion during clinical consultations. Regarding the presence or absence of pain or discomfort, 41.49% (n=20) of the patients felt some type of pain or discomfort, especially tiredness and lack of energy, which interferes directly with the performance of their basic daily activities. However, some positive aspects should be highlighted: self-esteem (78.72%, n=37), family support (72.34%, n=34), good home environment (71.28%, n=34), and social relationships and spirituality/religion/personal beliefs, both reported by 69.68% (n=33) of the participants.

The first two questions in the questionnaire refer to quality of life in general (rating it as "very poor", "poor", "neither very poor nor very good", "good" and "very good") and health satisfaction (rating it as "very dissatisfied", "unsatisfied", "neither satisfied nor dissatisfied", "satisfied" and "very satisfied"). The physical and psychological domains presented inverted scores in some questions. The interpretation of these results shows that the lower the score, the better the patient is. The results of the responses of each facet can, therefore, be applied on a normal scale (1 2 3 4 5) or on an inverted scale (5 4 3 2 1)[18]. The scores obtained showed a fair satisfaction with health and general quality of life. Figure 1 shows the facets with inverted scores using a black bar.

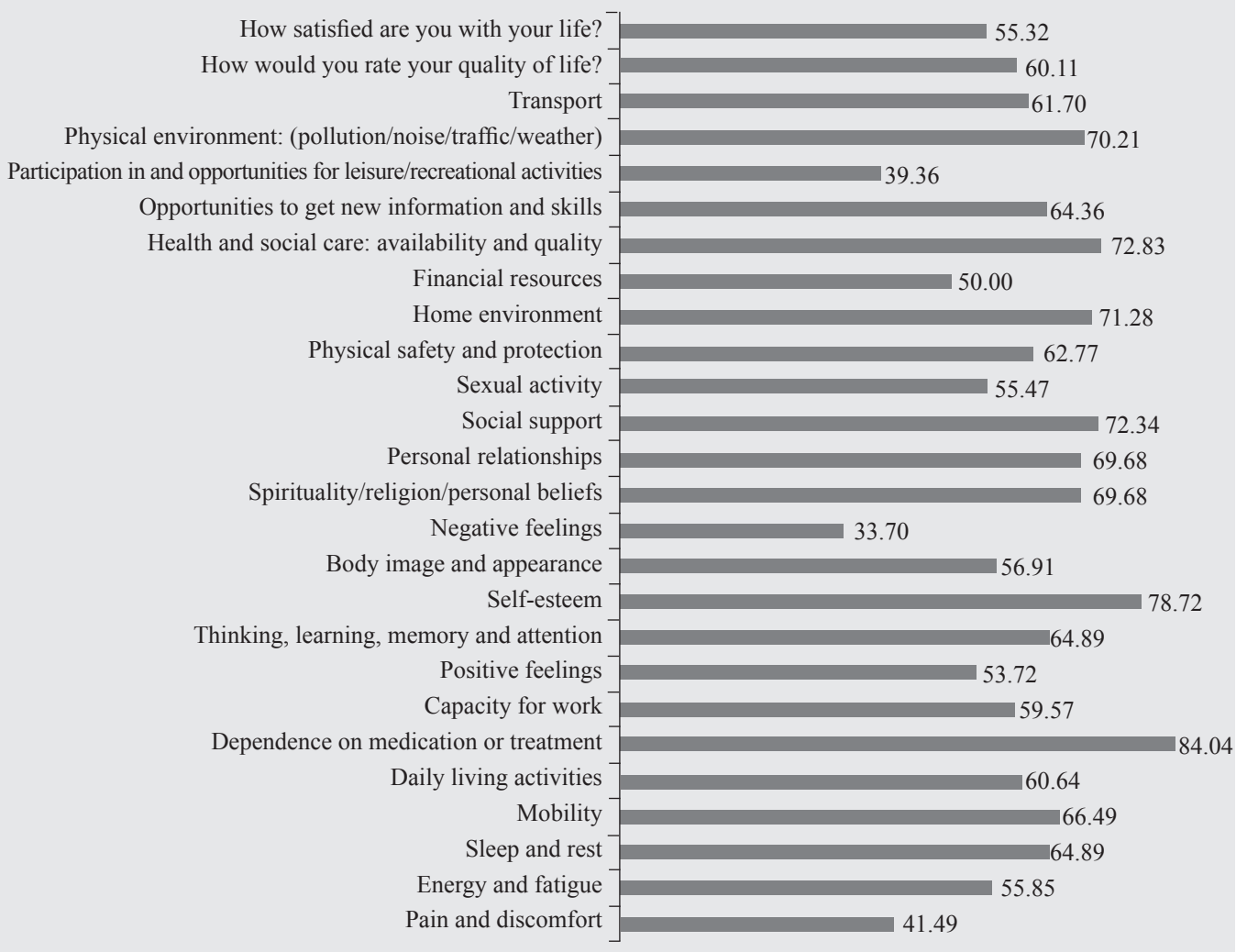

Figure 1 - Quality of life of candidates for heart transplantation in a reference hospital for the treatment of heart diseases according to facet scores. Fortaleza, Ceará, 2016.

The Pearson's correlation coefficient was used to check for associations between the quantitative variables (anthropometric measures x domains), with values between -1 and 1. The results presented in Table IV show that there is a direct linear correlation between TS and psychological domain and an inversely proportional correlation between height and quality of life domain; however, the correlation between the variables tested is not strong.

The linear correlation coefficient between the quality of life variables and the anthropometric measures measured the degree of correlation (and the direction of this correlation – whether positive or negative). Values close to -1 indicate that there is a perfect inversely proportional relationship between the variables and values close to 1 indicates that there is a perfect directly proportional linear correlation between the variables. Values close to 0 show that there is no linear correlation between the variables.

Table IV - Correlation between anthropometric measures and quality of life domains in candidates for heart transplantation. Fortaleza, Ceará, 2016.

Anthropometric Measures	Domains (quality of life)				
	Physical	Psychological	Social Relationships	Environment	Quality of Life
Weight	0.0199	0.0066	0.1155	0.0404	0.0483
Height	0.1274	0.2235	0.2641	0.1465	0.3127
Arm Circumference	-0.0572	-0.1293	0.0641	-0.0369	-0.0273
Mid-arm Muscle Circumference	-0.0362	-0.0132	0.0866	0.0065	0.0215
Triceps Skinfold	-0.0317	-0.2458	-0.1446	-0.0161	-0.0203

* Correlation between variables was assessed using Pearson's Linear Correlation.

DISCUSSION

The mean age of the study participants was 50.64±12.45 years, with a predominance of middle-aged adults, which may be justified by the aging of the Brazilian population. However, a study that assessed the quality of life of hospitalized patients with heart disease showed a higher prevalence of men and a mean age of 62.14 years[8].

As for the level of education, the results of the present study were similar to those reported by another study[8] in which 75% of the patients had incomplete primary education and 7.14% completed secondary education[8]. Monthly income is an important factor associated with treatment, and the results of the same study[8] showed that 55.32% of the patients had a monthly income of only 1 minimum wage or less.

Other studies have found that the majority of the patients analyzed received on average 2-3 minimum wages per month[8,19]. Low levels of education and income are risk factors for re-hospitalizations. The higher the level of education of a patient, the better his/her ability to understand and the easier it will be to make decisions for the promotion, recovery and protection of his/her health and increase adherence to post-discharge therapy. In addition, income interferes with access to health services and purchase of medication and food[19,20].

A study carried out to assess health-related quality of life in 170 older adults with HF showed that 83% of the individuals were professionally inactive, which included unemployed people, retirees and sickness benefit recipients[21]. In the present study, the sum of the percentages of inactive individuals (unemployed people and retirees) resulted in 97.87% (n=46) of the patients included in this group, which may be justified by the limitation posed by the disease and which is associated with dyspnea and other related symptoms.

In the present study, the patients (40.43%) reported a duration of the diagnosis of HF of approximately 60 months (5 years), with a predominance of idiopathic cardiomyopathy and ischemic cardiomyopathy – both affecting 38.3% (n=18) of the participants. A similar result was found in another study[21] in which the mean duration of diagnosis of HF was 65.9 months (±42.4; median=60.0) and the most frequent etiologic factor was ischemic heart disease, which affected 46.5% of the patients, followed by hypertension (32.4%)[21].

Functional classification stratifies the degree of limitation posed by the disease for an individual's performance of daily activities[2]. The study showed that the majority of the patients presented functional class II and III (95.74%, n=45), which also justifies the limitation and inactivity presented by almost all the patients analyzed. In class II, the symptoms are triggered by daily activities. In class III patients are even more limited as the symptoms are triggered by less intense activities or small efforts[2].

The main comorbidities and risk factors associated with cardiovascular diseases in the present study are consistent with other findings, particularly with a study that found a high prevalence of hypertension in 57.45% of the individuals analyzed. This finding is consistent with the findings of a study[21] which showed that the most prevalent comorbidities in HF patients are SAH (77.6%), arterial disease (44.1%), dyslipidemia (35.9%) and type II diabetes mellitus (34.7%). Another study has also presented SAH as the most prevalent comorbidity in 40.4% of the patients, followed by diabetes mellitus in 17% of the patients[22].

Cardiovascular risk factors can be divided into modifiable and non-modifiable risk factors. Non-modifiable risk factors include sex, age and heredity, and modifiable risk factors include smoking, drinking, sedentary lifestyle, stress, obesity, hypertension, diabetes mellitus and dyslipidemias. Modifiable risk factors are acquired over time and are related to patients' lifestyles. In all, 40.43% of the patients analyzed in the present study were ex-smokers and 44.47% were ex-drinkers, thus demonstrating that unhealthy habits and lifestyle are factors that increase the probability of occurrence of cardiovascular diseases and other non-communicable diseases.

Smoking was one of the risk factors reported by 31.9% of the participants in another study[21]. Family history was also one of the risk factors found in the present study, with a 48.97% prevalence rate of heart disease in the patients' families. SAH, in addition to being a comorbidity and a cardiovascular risk factor, is also an important risk factor for the decompensation of the disease and was present in 23.86% of the patients analyzed. However, the main risk factor associated with decompensation was physical effort, which was reported by 64.91% of the patients.

It is known that the clinical symptoms of HF, such as dyspnea, fatigue, edema, which are associated with energy loss and loss of muscle mass, can cause great discomfort and mobility and functional impairment in addition to interfering with individuals' quality of life[6,10].

The analysis of the nutritional status of the participants of the present study showed that most older patients presented normal nutritional classification regarding BMI for older adults, AC, MAMC, and TS. However, most adult patients (47.22%) presented a nutritional diagnosis of overweight. Similar results have been found in other studies in which 45.6% of the patients were at normal weight and 20.0% were at risk of obesity (overweight)[23] and 25.5% were at normal weight, 23.4% were at risk of obesity and 10.6% were obese[20].

The clinical progress of patients with HF leads to a series of physiological alterations which cause an imbalance between anabolic and catabolic processes, which are important factors in the genesis of cachexia and are related to skeletal muscle

proteolysis[4,24]. However, the presence of malnutrition was low in relation to the percentages of normal weight and overweight/obesity in the patients analyzed in the present study. It should be noted that although patients are classified as having normal weight and/or being at risk of obesity and obesity, they are still considered patients at nutritional risk. In this regard, patients with increased BMI may have functional and structural cardiac alterations even in the absence of a clinical heart disease due to subclinical systolic and diastolic dysfunction[6].

The assessment of food intake through the FFQ showed a high rate of inadequate intake of milk, cheese and yogurt, beans and oilseeds, and fruits and vegetables in 87.75%, 87.36% and 54.42% of the study participants, respectively.

The Brazilian food pyramid for healthy eating recommends the daily intake of three servings of milk or dairy products, preferably skimmed milk for adults and whole milk for children[13]. Evidence shows that the intake of low-fat dairy products lowers blood pressure because milk contains several components, such as calcium, potassium and bioactive peptides, which contribute to the control and lowering of blood pressure[25,26].

The food pyramid recommends the intake of at least 1 serving of beans and oilseeds per day, and the daily intake of beans and rice in a 1:2 ratio. This typical Brazilian combination, beans and rice, is healthy and rich in protein. The vegetable foods with highest protein content are legumes. When boiled, they contain 6% to 11% of protein. They also contain complex carbohydrates (starch) and are rich in dietary fiber, vitamin B, iron, calcium and other minerals, and bioactive compounds. They contain small amounts of fat, almost all of which are unsaturated. Although the relative participation of beans in Brazilian food (5.68%) is still within the recommended intake, there is a worrying downward trend that needs to be reversed in a short time. This assertion could be confirmed according to the results of the study in which 67.76% of the participants never consumed food from these groups[13].

There was also inadequate intake of oils and fats (78.23%, n=37) and sugars and sweets (81.97%, n=39) in the present study. Tis low intake is actually positive because the excess intake of these foods has been associated with the onset of noncommunicable diseases (NCDs). The intake of rice, bread, pasta, potato and cassava was adequate in 81.97% (n=39) of the sample and the intake of meat and eggs, including red meat, chicken, fish and eggs, was adequate in 66.12% (n=30) of the participants. Regarding the latter, red meat was the least consumed. Similar results were found in another study in which the most consumed food group was the meat and offal group in 57.4% of the participants. However, the high intake of encased meat should be highlighted; in all, 38.1% of the patients consumed foods of this group at least 2-4 times per week, and fruit intake was found in 34.8% of the participants[27]. Although fruit intake was higher in that study[27], it referred to weekly intake, and not daily intake; therefore, the intake is inadequate according to the pyramid recommendations[13].

According to the pyramid, the intake of three servings of fruits and vegetables is recommended as these foods contribute to the protection of health and reduce the risk of onset of noncommunicable diseases, such as SAH, DM and obesity[24].

Diets that emphasize the intake of fruits and vegetables favor the improvement of several risk factors, including blood pressure, lipid profile, insulin resistance, inflammatory markers, endothelial function and weight control. The intake of fruits and vegetables seems to reduce the onset of noncommunicable diseases, particularly coronary heart disease, due to the existence of nutrients such as potassium, folate, vitamins, fibers and other phenolic compounds[28].

The eating patterns adopted over the last decades can be harmful to health in several ways. Excessive intake of salt/sodium increases the risk of hypertension and cardiovascular events, and the high intake of red meat and processed meat, as well as other animal fats, sources of saturated fatty acids and trans fatty acids, is associated with cardiovascular diseases and diabetes, because they increase the concentration of plasma lipids and lipoproteins. Regular intake of fruits and vegetables reduces the risk of heart disease and cancer[29-31].

The types of carbohydrates in the food also deserve attention. A diet rich in unrefined foods that falls within the lower limit (45%) is healthier than one that falls within in the upper limit (65%) of energy from this food group. The intake of total carbohydrates (complex + free or simple sugars) should be 55% to 75% of the total energy value (TEV) of the daily diet. More than half of the energy supplied should originate from foods rich in complex carbohydrates (grains, tubers and roots), i.e., 45% to 65% of the TEV. A diet that meets this recommendation has many benefits, especially when whole carbohydrates are used[13].

Dietary planning should take into account nutritional status, clinical conditions and associated comorbidities so that dietary therapy can have the expected benefits[6]. The dietary pattern of heart disease patients should be rescued by encouraging healthy eating and providing guidelines on food choice, preparation, amount and possible dietary substitutions, always focused on lifestyle change[27].

Regarding the quality of life, all the domains analyzed in the present research exhibited a fair to good quality of life and the highest coefficients of variation were found in the self-rate quality of life, the physical domain and the psychological domain. This means that because of the high variability of data in these domains, the mean quality of life score cannot be the highest. The results obtained from the analysis of facet scores showed positive and negative aspects regarding quality of life. The negative aspects include the fact that 41.49% of the individuals feel some type of pain or discomfort related to fatigue and lack of energy. This can be reaffirmed when analyzing the energy and fatigue score reported by the patients, which directly interferes with the performance of basic daily activities.

A study on the quality of life of older adults compared the four domains and general QoL among the participants and found that the highest scores among the older adults in the community were in domains 1 (physical), 2 (psychological) and 3 (social relationships), but only the second and third domains presented statistically significant difference[32].

Another study on the quality of life of older adults showed that the variables studied independently explained a variance in the physical domain; 9.2% of the variance in the psychological domain and 4.8% of the variance in the social domain, respectively. In these three domains, the presence of diseases was inversely associated with quality of life, i.e., the older adults without any diseases had a significantly better quality of life than those who had at least one disease and the other variables did not significantly influence the quality of life of the older adults[33].

Another negative aspect found in the present research refers to the participants' dependence on medications and/or the need of a companion during the clinical consultations. Regarding quality of life, the little leisure time reported only by 39.36% of the patients should be highlighted; additionally, those who did not engage in leisure time activities said that it was due to fatigue and/or financial cost.

Despite the low significant correlation between the variables in the present study, it is important to emphasize that quality of life should be assessed as a whole and not only by isolated domains. Even with some domains being the most affected, the patients in the present study presented, in a general way, a fair to good quality of life. The psychological domain and the social relationships presented values closer to the maximum score, which classifies the quality life as very good. The impact of the disease on quality of life can be influenced by multiple factors, such as disease severity, comorbidities, ethnicity, duration of diagnosis, family support and/or psychological support[34].

Research has shown that the greatest impact on patients' quality of life was related to the physical domain, i.e., the perception of difficulties in carrying out some task, long walks and the presence of shortness of breath during the performance of such tasks. Undeniably, the main limitations of the patient with HF are physical, as they have a great impact on the working life and serious socioeconomic impact with the progression of the disease[35].

Active and healthy aging is related to the promotion of autonomy and thus the prevention of social isolation and solitude among people because quality of life and well-being are directly linked to social and family relationships and the feeling of being useful[36].

Some of the positive aspects that should be highlighted in the present study are social support, personal relationships, the environment in which people live and self-esteem. In this regard, the patients were "satisfied" or "very satisfied" with their personal and social relationships, such as the support received from friends and family and the environment in which they live. These are factors that significantly impact the patient's self-esteem. In addition, even though few leisure activities were mentioned, the patients' good relationship with their family and friends was a positive factor for the self-esteem of the study participants.

Social participation in the aging process reinforces social bonds through the relationships established with the various institutional subsystems, such as the family, the neighborhood and the peer group. In addition, it stands out as an important factor for older adults' happiness and is associated with better levels of well-being, satisfaction, health and quality of life[37,38].

The results obtained in the present study showed a direct linear correlation between TS and the psychological domain and an inversely proportional correlation between height and quality of life, but these relationships were not strong. However, the sample size constituted a limitation resulting from appointment absenteeism and refusal to participate in the research.

CONCLUSION

Regardless of the demographic and clinical variables, the adult and older patients analyzed in the present research presented a nutritional profile within the normal parameters (according to BMI, AC and MAMC measures) and/or overweight for TS in the older patients and fair to good quality of life. In addition, nutritional status and quality of life may vary between individuals and in a same individual depending on the stage of life and the social/family support they receive. Therefore, these factors act as positive determinants of quality of life even in the presence of heart disease.

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Mailing address:
Luana Najara Ferreira Chaves
Hospital de Messejana Dr. Carlos Alberto Studart Gomes
Avenida Frei Cirilo, 3480
Bairro: Messejana
CEP: 60846-190 - Fortaleza - CE - Brasil
E-mail: luanachaves35@yahoo.com.br