ABSTRACT
To characterize the nutritional profile of patients receiving home care. This was a cross-sectional, descriptive and quantitative study. 160 participants were included and weight, height, upper arm circumference (AC) and knee height were collected. Nutritional status was classified by BMI and AC for adults and by WHO for pediatrics. The sample consisted of 28 pediatric patients, 86 elderly people and 46 adults. The results were expressed as means and percentages. There was a higher prevalence of underweight in the elderly (72%). By AC, most of the elderly had some degree of malnutrition (74.41%). Among the adults, 45.65% (n=21) were underweight and 67.39% were malnourished by AC. An analysis of the weight/age index showed that 82% of the children were of adequate weight, followed by the very underweight (10.71%). The adult and elderly participants had inadequate nutritional status due to some degree of malnutrition.

Keywords: Nutritional Status, Nutritional Assessment; Malnutrition; Home Care.
INTRODUCTION

Nutritional status is an important health indicator that reflects the balance between an individual's intake and nutrient demand (need). Its evaluation is a diagnostic tool to characterize diseases in populations, and the combination of anthropometric, dietary and biochemical methods is recommended in the daily routine of health care.

Malnutrition tends to increase considerably in the elderly population with the progression of age, presence of comorbidities, and dependence on care. However, this condition remains underdiagnosed and undertreated, including in the hospital setting. It is extremely important to identify patients at higher risk, so that there can be early intervention with personalized nutritional elaboration.

Nutritional therapy at home is included in the Human Right to Adequate Food (DHAA) for patients with special food and nutrition needs, with clinical stability and who can receive care from their own family members or legal guardians, after they are properly trained through training and health education, providing hospital discharge and reintegration into family life, thus avoiding long-term hospital admissions or rehospitalizations.

Among the risks and complications of the patient in home care is the risk of malnutrition due to the absence or decrease of supervision of the patient's nutritional therapy, as well as the establishment of a diet therapy that is inadequate to the patient's nutritional needs and to the conditions and family routine in this way. Nutritional risk may be increased in this population and, consequently, malnutrition may occur.

The gaps in the home care process, the need for early nutritional interventions, and the assessment of nutritional status, immediately after leaving the hospital environment and at the entrance of the home, are poorly described in the literature.

Thus, the objective of this study was to characterize the nutritional status of patients followed by a home care service.

METHODS

This is a cross-sectional, descriptive and quantitative study. A cross-sectional study is one that collects and analyzes data at a given point in time. In the descriptive study, we analyzed data from a given population without changing them or performing interventions, with the aim of describing detailed data about a given population. The quantitative study, on the other hand, aims to perform data analysis by applying static analyses, such as percentages, means and regressions.

The research was carried out at the Home Care Service (SAD) of the Waldemar de Alcântara General Hospital (HGWA), an equipment of the Health Department of the State of Ceará (SESA), located in Fortaleza-Ceará.

A total of 160 pediatric, adult and elderly individuals of both sexes were included in the study, with indication for monitoring by the nutrition service of the SAD of the HGWA. Patients who were unable to measure calf circumference due to anatomical (bilateral amputated lower limbs) or clinical (lymphedema) issues were excluded from the study, as well as those patients whose family members did not accept inclusion in the study.
Data collection was performed at the time of the home visit of the SAD nutritionist to the patient. A semi-structured questionnaire was elaborated, containing information on the patient’s identification (such as initials of the name, gender and age), clinical diagnosis and presence of comorbidities, feeding route and type of diet in current use (including information on the use of supplementation). Data were collected from May to June 2021, after approval by Plataforma Brasil.

The anthropometric evaluation was performed by measuring the weight using a portable digital scale with a capacity of up to 150kg non-slip Mondial Ellegance®, with as little clothing as possible, without slippers or sandals and accessories that could interfere with the weighing. Height was measured using a compact stadiometer with a capacity of 210 cm, Wiso®. The stadiometer support was attached to the wall at a height of 2 meters, and was pulled down until it reached the height of the individual with him barefoot, with his feet together, leaning against the wall with his head erect.

As for the patients who could not weigh and verify their height by conventional methods, their weight and height were taken by estimation, using the formula of Chumlea⁶, and in the formula for calculating the estimated height, the measurement of knee height is used, and for the calculation of the estimated weight, the knee height and the arm circumference (measured with an inelastic tape).

With the height and weight data collected, the BMI (Body Mass Index) of each patient was calculated using the weight/height formula². To classify the BMI of the elderly, the cut-off point for the elderly, proposed by the Nutrition Screening Initiative (NSI)⁷, was used, which considers underweight (BMI < 22 kg/m²), p, adequate or eutrophic weight (22-27 kg/m²) and overweight (>27kg/m²).

To classify the BMI of adults, we used the cut-off points proposed by the World Health Organization⁸, which consider thinness (BMI<18.5 kg/m²), adequate weight or normal weight (18.5 to 24.9 kg/m²), overweight (25 to 29.9 kg/m²) and obesity (>30 kg/m²). The diagnosis of weight adequacy for the child's age was made according to the ONIS⁹.

The calf circumference (NC) parameter was also used, measured with the individual seated (with the use of a Sanny single-fiber tape measure with lock), with the left leg forming a 90° angle with the knee. The measurement was performed in the region of greatest calf enhancement, without compressing it. Values lower than <31cm indicate loss of muscle mass, with a diagnosis of malnutrition; Values >31 indicate preserved or adequate muscle reserve¹⁰.

To check the arm circumference, the patient's arm was at a 90-degree angle, and the prominence of the olecranon and ulna was palpated and measured with a tape measure. Then the midpoint between the distance of the two was checked; then contouring the arm with the inelastic tape measure at the midpoint height without pressing¹¹. Knee height was measured with the patient sitting or lying down, with the ankle and knee flexed at right angles and positioning the base of the anthropometric tape under the heel of the right foot and the rod pressing on the head of the fibula¹².

The information about the presence of pressure ulcers in the patient followed by the SAD was provided from an active search of the patient’s electronic medical record. It is noteworthy that within the team there are nursing professionals who perform this
diagnosis. Before each home visit, the electronic medical record is opened for reading and appropriation of the patient’s clinical case. This is considered a routine procedure specific to the service.

Data analysis was performed using Microsoft Excel version 2010, using simple and absolute frequency. The calculation of the prevalence rate of LLP will be obtained from the number of affected individuals at a given time, divided by the number of people at risk (total number of respondents).

This study was approved by the Research Ethics Committee of the Gonzaga Mota District Hospital, as stated in Substantiated Opinion No. 5,649,747. The interviewees were presented with the Free and Informed Consent Form, in accordance with Resolution No. 466/1213, which directs the ethical aspects of research involving human beings.

RESULTS

The data were separated into two blocks, divided between adult/elderly and pediatric axis to better understand the results. The sample consisted of 132 patients with a higher prevalence of females, 53% (n=70). Of these patients, 65% (n=86) were elderly and 12% (n=16) were under palliative care. 15% (n=19) had LPP in different stages and regions.

When evaluating BMI, a higher prevalence of underweight was observed in the elderly (72%/n=62). By measuring BC, it was possible to infer that most elderly people had some degree of malnutrition when the three classifications were added together (74.41%/n=64). In the adult population, it was observed that 45.65% (n=21) were with some degree of thinness based on BMI and 67.39% (n=31) had some degree of malnutrition based on WC.

Table 01. Stratification of nutritional status by BMI and WC of patients receiving home care. Fortaleza, CE, 2024

<table>
<thead>
<tr>
<th>Adult BMI</th>
<th>Nº</th>
<th>%</th>
<th>Elderly BMI</th>
<th>Nº</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thinness</td>
<td>21</td>
<td>45,65%</td>
<td>Low weight</td>
<td>62</td>
<td>72,09%</td>
</tr>
<tr>
<td>Eutrophy</td>
<td>18</td>
<td>39,13%</td>
<td>Eutrophy</td>
<td>16</td>
<td>18,60%</td>
</tr>
<tr>
<td>Overweight</td>
<td>4</td>
<td>8,7%</td>
<td>Overweight</td>
<td>5</td>
<td>5,81%</td>
</tr>
<tr>
<td>Obesity</td>
<td>3</td>
<td>6,52%</td>
<td>Obesity</td>
<td>3</td>
<td>3,5%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CB Adulto</th>
<th>Nº</th>
<th>%</th>
<th>CB Idoso</th>
<th>Nº</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Severe Depletion</td>
<td>8</td>
<td>17,4%</td>
<td>Severe Depletion</td>
<td>17</td>
<td>19,76%</td>
</tr>
<tr>
<td>Moderate Depletion</td>
<td>9</td>
<td>19,56%</td>
<td>Moderate Depletion</td>
<td>18</td>
<td>20,93%</td>
</tr>
<tr>
<td>Mild Depletion</td>
<td>14</td>
<td>30,43%</td>
<td>Mild Depletion</td>
<td>29</td>
<td>33,82%</td>
</tr>
<tr>
<td>Eutrophy</td>
<td>9</td>
<td>19,56%</td>
<td>Eutrophy</td>
<td>10</td>
<td>11,62%</td>
</tr>
<tr>
<td>Overweight</td>
<td>2</td>
<td>4,35%</td>
<td>Overweight</td>
<td>7</td>
<td>8,13%</td>
</tr>
<tr>
<td>Obesity</td>
<td>4</td>
<td>8,7%</td>
<td>Obesity</td>
<td>5</td>
<td>5,81%</td>
</tr>
</tbody>
</table>

Source: prepared by the authors, 2024.
Regarding the chosen feeding route, it was identified that the use of nasoenteral tube (NET) was the most prevalent (59%/n=51), as can be seen in the table below:

**Table 02. Stratification of feeding routes for patients receiving home care. Fortaleza, CE, 2024**

<table>
<thead>
<tr>
<th>Feeding Path</th>
<th>Nº</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oral</td>
<td>37</td>
<td>28%</td>
</tr>
<tr>
<td>Nasoenteric tube (SNE)</td>
<td>71</td>
<td>54%</td>
</tr>
<tr>
<td>Gastrostomy</td>
<td>23</td>
<td>17%</td>
</tr>
<tr>
<td>Mixed (SNE + Oral)</td>
<td>1</td>
<td>1%</td>
</tr>
</tbody>
</table>

**Source:** prepared by the authors, 2024.

Data analysis in pediatrics revealed a sample composed of 28 patients, with a mean age of 6.4 ± 4.2 years, with a higher prevalence of males - 55.55% (n=15).

When evaluating the anthropometric weight-for-age index, it was observed that 85.18% (n=23) had adequate weight for their age, followed by 11.11% (n=3) of very low weight for their age. As described in the table below:

**Table 03. Stratification of the WEIGHT x AGE index of children in home care. Fortaleza, CE, 2024**

<table>
<thead>
<tr>
<th>Weight Adequacy</th>
<th>Nº</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very Low Weight for Age</td>
<td>3</td>
<td>10.71%</td>
</tr>
<tr>
<td>Underweight for age</td>
<td>2</td>
<td>7.15%</td>
</tr>
<tr>
<td>Appropriate Weight for age</td>
<td>23</td>
<td>82.14%</td>
</tr>
<tr>
<td>High Weight for age</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

**Source:** prepared by the authors, 2024.

**DISCUSSION**

Hospital malnutrition is an evident problem that has been frequently occurring in the literature in recent years. However, the implications of this nutritional status after hospitalization may have repercussions on the functional and clinical status of patients when they are already at home, thus hindering weight adjustment and increasing the risk of complications associated with malnutrition.

In the study by Fernandes, it was described that, at the time of nutritional guidance, during the arrival at home of cancer patients using enteral nutrition, there was a higher prevalence of underweight by BMI (49.2%) and a higher percentage of weight loss during follow-up (39.7%), even though most patients had higher nutritional goals (30-35 kcal/k/day and 1.2-1.5 ptn/kg/day). The authors point out that both patients and their caregivers may have difficulties in the management of home enteral tubes, which in turn can lead to complications such as adherence to the most appropriate nutritional therapy, thus leading to weight loss and changes in nutritional status.

Based on Campos, in his study with elderly patients in home care, it was possible to observe that the application of the nutritional mini-assessment proved to be more
specific for screening nutritional risk (40%) when compared to the measurement of AC (10%) and BMI (8%) for screening for malnutrition. This data differs from our results, which showed the presence of malnutrition in this population in different ways. The literature points out the limitations of anthropometric assessment and the superiority of screening by nutritional screening, and its recommendation in the hospital environment is mandatory. However, few studies reinforce its use at home, and the recommendations of this practice are not recurrent.

A relevant finding in the study by Lindenau was that, in addition to the presence of malnutrition observed by the subjective global assessment (SGA) (95.5%), almost 40% of the patients had food intake lower than usual and 56.5% had some type of reduction in food intake. Often, the regularity of intake is not monitored, and this care should be transferred to the family or responsible caregiver in order to avoid further losses in nutritional status and the onset of malnutrition in home patients.

Guerreiro, in his study with cancer patients treated at a nutrition outpatient clinic, used different methods, such as BMI, AC and SGA, to perform the nutritional diagnosis. When BMI was assessed alone, this indicator did not show sensitivity for screening for malnutrition, unlike BC (which alone can be used as a predictor of nutritional status) and SGA, which was more sensitive. Thus, it is possible to infer that the use of other parameters, in addition to BMI, in patients followed at home can be an effective strategy for this screening.

Ruggeri pointed out in his study, with 969 of cancer patients in home care receiving enteral or parenteral nutrition, that patients with cachexia and refractory cachexia at the time of admission to home care were associated with reduced survival and a low life expectancy at 6 weeks.

Cavagnari showed in his study that the most frequent feeding route was the oral route (45.8%), followed by the enteral route (41.7%), data that, unlike this and other studies in the literature, indicate a higher prevalence of use of exclusive enteral nutritional therapy. Due to the clinical conditions of the patients at the time of transition to home, for safety, minimizing the risks of bronchoaspiration and respecting the functional status of the individual, many patients end up going with an alternative feeding route and being followed up by home services to perform, among many things, weaning from the tube.

Few studies provide an accurate nutritional assessment in pediatric patients in home care. In the study by Sousa, conducted with children treated at a special patient outpatient clinic of a teaching hospital, it was observed that, even at home, pediatric patients had adequate weight for age (59%) and 39% had low weight for age. Another study also found a higher prevalence of eutrophy (73.6%) in a pediatric population assisted at home. It is known that malnutrition rates in this population are higher when hospitalized and that recovery of nutritional status can occur at home when the patient is adequately assisted by the interdisciplinary care team.

Dipasquale brought some recommendations for nutritional care in children using enteral nutrition at home. Among them, accurate assessment of nutritional status is mandatory in this population, given the risk of malnutrition and changes in energy needs during follow-up. Attention should be redoubled for children with neurological impairment, given the need to use specific body assessment measures and formulas for
age and condition. The evaluation of body composition and differentiation between muscle and fat should also be performed in this population.25

It was possible to identify a low percentage of patients under palliative care, thus differing from the results found in the studies by Cavagnari et al.14 and Amano et al.26, who found in their studies a considerable sample of patients on palliation using home enteral nutrition. The reality of home care in this population is great. We believe that in this study, the collection period may have influenced this result, given the high prevalence of palliation patients.

It is a fact that, as a measure proportional to comfort, this patient is often discharged so that care can take place in the warmth of home. However, the reality of chronic patients with high rehabilitation capacity is sometimes confused with patients in palliative care, interfering with their therapeutic plan or in the late indication of this patient to this type of care.26

When the presence of pressure ulcers was assessed, a low percentage of participants with this complication was observed. Divergent results were reported by Venâncio et al.27, who found that 75% of the study population had PPL. It is worth noting that immobility in bed, failure to perform decubitus changes, and inadequate nutrition are contributing factors to the onset of these changes.

One of the limitations of this study was the absence of other parameters such as the use of nutritional screening, other measurements such as calf circumference or adductor pollicis muscle to assess muscle mass depletion, making anthropometric assessment more accurate for better determination of nutritional status.

CONCLUSÃO

The participants in this study presented alterations in their nutritional status, mainly evidencing the existence of malnutrition, which could be identified by AC and BMI upon arrival at home. It is possible to infer that these patients end up losing weight in the hospital environment and it is often necessary to pay greater attention to ensuring the nutritional supply adequate to the reality of the home, in order to meet the individual nutritional needs of each patient.

BMI, WC and weight-for-age index are simple indices and, even though they are not considered the gold standard, they should be part, along with other parameters, of the nutritional therapy routine of home patients, aiming at screening for malnutrition and early interventions in the recovery of the nutritional status of this population.

REFERENCES


