



## Revisión

# State of malnutrition in Cuban hospitals; a needed update

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### Abstract

**Rationale:** The Cuban Study of Hospital Malnutrition, as conducted during 1999 – 2001 with 1,905 patients assisted in 12 hospitals from 6 provinces of the country, revealed a hospital malnutrition rate of 41.2%. Having elapsed a decade after the first edition of the enquiry, update of this estimate is mandatory.

**Objective:** To update the state of hospital malnutrition in Cuba.

**Material and method:** Presence of malnutrition in 1,664 patients admitted to 12 hospitals from 8 provinces of the country between March 2012 and March 2014 was documented with the Subjective Global Assessment (SGA) survey of the nutritional status. The state of hospital processes of food and nutritional care was assessed by means of the Hospital Nutrition Survey (HNS).

**Results:** Current hospital malnutrition rate was 36.9% ( $\Delta = +4.3\%$ ;  $p < 0.05$ ). Completion rates of hospital exercises of nutritional assessment and of use of nutritional replenishment therapies were higher.

**Conclusions:** Having elapsed 10 years after the first edition of the ELAN CUBA Study, modest advances are seen in the identification and treatment of malnutrition in Cuban hospitals. It is perceived that formation and insertion of nutritionists verticalized in hospital care has contributed to the observed change. In addition, the activity of the Cuban Society of Clinical Nutrition and Metabolism in the advancement of the disciplines of nutritional therapy, artificial nutrition and metabolism might have served for a better recognition of the health problem posed by hospital malnutrition.

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Key words: *Hospital malnutrition. Nutritional assessment. Nutritional replenishment.*

### ESTADO DE LA DESNUTRICIÓN EN LOS HOSPITALES DE CUBA: UNA ACTUALIZACIÓN NECESARIA

### Resumen

**Justificación:** El Estudio Cubano de Desnutrición Hospitalaria, conducido en el bienio 1999 – 2001 con 1,905 pacientes atendidos en 12 hospitales de 6 provincias del país, reveló una tasa de desnutrición hospitalaria del 41.2%. Transcurrida una década de aquella indagación, se impone la actualización de este estimado.

**Objetivo:** Actualizar el estado de la desnutrición hospitalaria en Cuba.

**Material y método:** La presencia de desnutrición en 1,664 pacientes ingresados en 12 hospitales de 8 provincias del país entre Marzo del 2012 y Marzo del 2014 se documentó mediante la Encuesta Subjetiva Global (ESG). El estado de los procesos hospitalarios de cuidados alimentarios y nutricionales se evaluó con la Encuesta de Nutrición Hospitalaria (ENH).

**Resultados:** La tasa corriente de desnutrición hospitalaria fue del 36.9% ( $\Delta = +4.3\%$ ;  $p < 0.05$ ). Las tasas de completamiento de los ejercicios hospitalarios de evaluación nutricional y de uso de terapias de repleción nutricional fueron superiores.

**Conclusiones:** Transcurridos 10 años de la primera edición del Estudio ELAN CUBA, se aprecian modestos avances en la identificación y el tratamiento de la desnutrición en los hospitales en Cuba. Se percibe que la formación e inserción de nutricionistas verticalizados en la actuación hospitalaria haya contribuido al cambio observado. Asimismo, la actividad de la Sociedad Cubana de Nutrición Clínica y Metabolismo en el avance de las disciplinas de la terapia nutricional, la nutrición artificial y el metabolismo puede haber servido para un mejor reconocimiento del problema de salud representado por la desnutrición hospitalaria.

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Palabras clave: *Desnutrición hospitalaria. Evaluación nutricional. Repleción nutricional.*

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## Introduction

The ELAN Latin American Study of Hospital Malnutrition, completed between 2000 – 2001, revealed a malnutrition prevalence of 50.2% in 13 countries and 9,348 patients assisted at public hospitals<sup>1</sup>. As the result of this study, it was finally possible to know the magnitude of the institutional health problem that hospital malnutrition (still) represents. In view of the obtained results, FELANPE (Spanish acronym for *Latin American Federation of Clinical Nutrition, Nutritional Therapy and Metabolism*), a supranational entity auspicing the ELAN Study, recommended its replication in the different countries represented under it. Confirming researchers's hypotheses, national studies have been consistent in reporting high malnutrition rates among patients assisted in the public hospitals of the area<sup>2-3</sup>.

The Cuban Study of Hospital Malnutrition\*, conducted with 1,905 patients assisted in 12 hospitals from 6 provinces of the country, returned a malnutrition rate of 41.2%<sup>4-5</sup>. A tenth of the surveyed patients was severely malnourished. Malnutrition was dependent upon health condition leading to admission, presence of cancer, sex, level of instruction, and hospital length of stay. The ELAN Cuba Study also served to reveal the current state of hospital processes of food and nutritional care provided to the patient, in particular, hospital dietetic prescription and artificial nutrition<sup>6-9</sup>.

Having elapsed 10 years after the completion of the first version of the ELAN Cuba Study, the GCEDH (Spanish acronym for *Cuban Group of Hospital Malnutrition*) has perceived the time is right for updating the state of malnutrition in the hospitals of the country by means of the conduction of the second edition of the study<sup>†</sup>. In the past decade, the national health picture was significantly modified due, among other determinants, to the progressive aging of the Cuban population, and the advance of cancer diseases<sup>10</sup>.

There have been also important cultural and organizational changes in the provision of feeding and nutritional care to hospitalized patients during this time. A national network of hospital nutritional support groups was implemented with the social mission and duty of disseminating the "Good Food and Nutrition Practices" of the hospitalized patient; and the National Health System was staffed with nutritionists empowered in identifying, intervening and ultimately preventing nutritional disorders present in people assisted in ambulatory and hospital medical centers of the country<sup>11-12</sup>. It is expected that such epidemiological, organizational and cultural changes might influence upon the estimated rate of such health problem.

\*From now onwards referred as ELAN-CUBA 1.0.

† From now onwards referred as ELAN-CUBA 2.0.

Given the aforementioned, GCEDH has called for the re-edition of the Cuban Study of Hospital Malnutrition in order to update the rate of malnutrition in Cuban hospitals; to reveal the current state of the quality of food and nutritional care provided to the hospitalized patient; and to exam if changes have occurred in the quality indicators of such processes.

## Material and method

**Study design:** Analytical, cross-sectional.

**Procedures of the ELAN CUBA Study:** The design of the ELAN CUBA Study comprised the independent and parallel administration of two surveys aimed (the first one) to establish the nutritional status of the hospitalized patient, and to document the current state of hospital processes of food and nutritional care (the second one); respectively.

Subjective Global Assessment (SGA) of the nutritional status was used as the tool for nutritional diagnosis<sup>13</sup>, whereas hospital processes of food and nutritional care were documented by means of the Hospital Nutrition Survey (HNS) as previously described<sup>14</sup>.

**Research units:** Clinical surgical hospitals located in the capital cities of the provinces of the country which, in view of their structure, organization and activity, articulate the provision of health care within the local Public Health System, were eligible for inclusion in this study.

Number of surveyed patients in each hospital was dependent upon number of hospital beds, as shown in table I. Surveyed patients were (pseudo)randomly selected from among those hospitalized between April 2012 and December 2013 who could walk up to a scale to be measured and weighted, and answer to questions contained within the tools of the study; and voluntarily consented to be included within the study. Thus, comatose patients, or those ones with altered states of conscience and/or overt incapacity to respond to the SGA questions; as well as those who refused to be participate in the ELAN CUBA Study, were excluded.

On the day of the survey, the patient selected in the admission service was interviewed by the surveyors,

**Table I**  
*Sampling plan for each participating hospital in order to define the number of patients to be included in the Cuban ELAN Study of Hospital Malnutrition*

| <i>Number of beds per hospital</i> | <i>Number of beds to survey</i> |
|------------------------------------|---------------------------------|
| > 700                              | > 250                           |
| 500 – 700                          | > 200                           |
| 300 – 500                          | > 150                           |
| < 300                              | > 100                           |

and informed of the goals and purposes of the study. The patient was reassured of the confidential nature of the study, and the preservation of anonymity in the treatment of data recovered during the survey. In every moment the right of the patient to refuse to participate in the study was obeyed without affecting the hospital care provided.

Once informed consent was obtained, the patient was escorted to the nearest scale, measured and weighed, and the nutritional status qualified by means of the SGA. At the same time, patient's clinical chart was audited in order to recover data on the completion of nutritional assessment exercises, the use of food-by-mouth to support the nutritional status and hospital fasting, oral nutritional supplementation, and administration de artificial nutrition (Enteral/Parenteral) techniques. In case hospital bed to be surveyed were empty, the one following in the sampling list was studied.

**Data processing and analysis of results:** Data obtained after completion of the study's procedures were annotated on the corresponding forms, and stored in a digital container created *ad hoc* with ACCESS 7.0 for

OFFICE of WINDOWS (Microsoft, Redmond, Virginia, United States). Hospital malnutrition prevalence was estimated from the proportion of patients receiving (B + C) scores after conduction of SGA. The state of hospital processes of food and nutritional care was qualified by means of previously advanced quality indicators<sup>6-7</sup>.

Results obtained after conclusion of the ELAN CUBA Study version 2.0 were compared with those ones previously published<sup>4-7</sup> by means of tests of homogeneity based indistinctly upon ji-square distribution or normal distribution<sup>15</sup>. A level of significance lower than 5% was used to denote found differences as meaningful<sup>15</sup>.

## Results

At the conclusion of the ELAN CUBA Study version 2.0, 1,664 patients were surveyed in 12 hospitals from 8 provinces of the country. Surveyed patients represented 25.0% of the hospital beds previewed in the sampling plan. Table II shows hospitals included

**Table II**  
*Provinces of the country, hospitals, beds and patients included in the second edition of the Cuban ELAN Study of Hospital Malnutrition. Between brackets, the percentage of patients surveyed regarding the number of hospital beds.*

| <i>Province</i> | <i>Hospital</i>                              | <i>Number of beds</i> | <i>Surveyed patients</i> |
|-----------------|--|-----------------------|--------------------------|
| Pinar del Río   | Abel Santamaría Cuadrado                     | 830                   | 250<br>[30.1]            |
| Ciudad Habana   | Hermanos Ameijeiras                          | 650                   | 329<br>[50.6]            |
|                 | Centro de Investigaciones Médico quirúrgicas | 200                   | 65<br>[32.5]             |
|                 | Julio Trigo López                            | 335                   | 81<br>[24.2]             |
|                 | Luis Díaz Soto                               | 504                   | 165<br>[32.7]            |
|                 | Joaquín Albarrán                             | 350                   | 150<br>[42.8]            |
| Matanzas        | Faustino Pérez Hernández                     | 220                   | 92<br>[41.8]             |
| Cienfuegos      | Gustavo Aldereguía Lima                      | 630                   | 114<br>[18.1]            |
| Sancti Spiritus | Camilo Cienfuegos Gorriarán                  | 650                   | 204<br>[31.4]            |
| Holguín         | Vladimir Ilich Lenin                         | 668                   | 132<br>[19.8]            |
| Santiago        | Juan Bruno Zayas                             | 780                   | 36<br>[4.6]              |
| Guantánamo      | Agostinho Neto                               | 838                   | 46<br>[5.5]              |
| Totales         |  | 6,655                 | 1,664                    |

Sources: Records of the Cuban Study of Hospital Malnutrition.  
Closing date: June 30<sup>th</sup>, 2014.

in the ELAN CUBA Study, and local distribution of surveyed patients. Low sampling rates observed in two of the participating hospitals was due to their use as centers for reception, treatment and evacuation of patients assisted during cholera and dengue epidemics in the western provinces of the country during the 2012-2013 term.

ELAN CUBA Study version 2.0 returned a hospital malnutrition rate of 36.9%, as shown in Figure 1. This estimate was lower than the one found 10 years later: *ELAN CUBA 1.0*: 41.2% vs. *ELAN CUBA 2.0*: 36.9%;  $\Delta = +4.3\%$  ( $p < 0.05$ ; test for comparing independent proportions). In spite of this finding, observed change was rather modest.

Table III shows sociodemographical and clinical features of the patients studied in these two exercises. Although numerical differences among surveyed patients' features reached statistical significance, they however did not represent a substantial change a substantial change in hospital demographics. Observed changes in the proportion of patients with hospital stays  $> 7$  days (*ELAN CUBA 1.0*: 43.5% vs. *ELAN*

*CUBA 2.0*: 37.2%;  $\Delta = +6.3\%$  ( $p < 0.05$ ; test for comparing independent proportions), and average hospital length of stay (*ELAN CUBA 1.0*:  $12.3 \pm 19.6$  days vs. *ELAN CUBA 2.0*:  $9.3 \pm 19.3$  days;  $\Delta = +3.3$  days ( $t = 4.63$ ;  $p < 0.05$ ; test for comparing independent samples), might represent the impact of administrative and fiscal pressures for a more intensive exploitation of existing hospital dotation of beds.

Sixteen point six percent of patients (median of observed percentages in 10 categories: *Minimum*: 4.1%; *Maximum*: 39.7%) filled (at least) one indication for nutritional support. This behavior was similar to the one annotated in the former survey: *ELAN CUBA 1.0*: 10.7% vs. *ELAN CUBA 2.0*: 16.6% ( $\Delta = +5.9\%$ ;  $Z_w = -0.606$ ;  $p > 0.05$ ; Mann-Whitney-Wilcoxon test for comparing independent medians).

Table IV shows the occurrences of up to 10 indications for nutritional support in surveyed patients. During the time elapsed between both exercises an increase in the number of patients on *Nil-Per-Oris* in the moment of the survey (*ELAN CUBA 1.0*: 3.4% vs. *ELAN CUBA 2.0*: 11.0% ( $\Delta = -7.6\%$ ;  $p < 0.05$ ; test for

**Table III**  
*Historical behavior of sociodemographic and clinical features of surveyed patients in the Cuban ELAN Study of Hospital Malnutrition*

| Characteristic   | Findings             |                      |
|--|----------------------|----------------------|
|  | <i>ELAN Cuba 1.0</i> | <i>ELAN Cuba 2.0</i> |
| Sample size  | 1,905                | 1,664                |
| Sex <sup>§</sup>   |                      |                      |
| • Male   | 975 [51.2]           | 935 [56.2]           |
| • Female   | 930 [48.8]           | 729 [43.8]           |
| Age <sup>§</sup> , mean $\pm$ standard deviation                     | 53.0 $\pm$ 17.8      | 56.0 $\pm$ 34.2      |
| Age $\geq$ 60 years <sup>§</sup>                                     | 745 [39.1]           | 712 [42.8]           |
| Level of instruction <sup>§</sup>                                    |                      |                      |
| • Grammar  | 653 [34.3]           | 349 [20.5]           |
| • Junior high  | 510 [26.8]           | 399 [24.2]           |
| • High school  | 328 [17.2]           | 316 [19.0]           |
| • University   | 186 [9.8]            | 266 [16.0]           |
| • Senior technician  | 191 [10.0]           | 216 [13.4]           |
| • Undetermined   | 37 [1.9]             | 116 [6.7]            |
| Service of admission <sup>§</sup>                                    |                      |                      |
| • General Surgery  | 308 [16.2]           | 287 [17.2]           |
| • Internal Medicine  | 574 [30.1]           | 499 [30.0]           |
| • Orthopedics  | 90 [4.7]             | 48 [2.9]             |
| • Critical care  | 73 [3.8]             | 165 [9.9]            |
| • Other medical specialties  | 478 [25.1]           | 335 [20.1]           |
| • Other surgical specialties   | 382 [20.1]           | 330 [19.8]           |
| Length of hospital stay <sup>§</sup> , mean $\pm$ standard deviation | 12.3 $\pm$ 19.6      | 9.3 $\pm$ 19.0       |
| Length of hospital stay <sup>§</sup>                                 |                      |                      |
| • $\leq$ 7 days  | 1077 [56.5]          | 1046 [62.8]          |
| • $>$ 7 days   | 828 [43.5]           | 619 [37.2]           |

<sup>§</sup>  $p < 0.05$ . Test of homogeneity based on chi-square distribution.

<sup>§</sup>  $p < 0.05$ . Test for comparing independent means.

Sources: Records of the Cuban Study of Hospital Malnutrition.

Closing date: June 30<sup>th</sup>, 2014.

**Table IV**  
*Historical behavior of the indications for nutritional support in patients surveyed for the Cuban ELAN Study of Hospital Malnutrition*

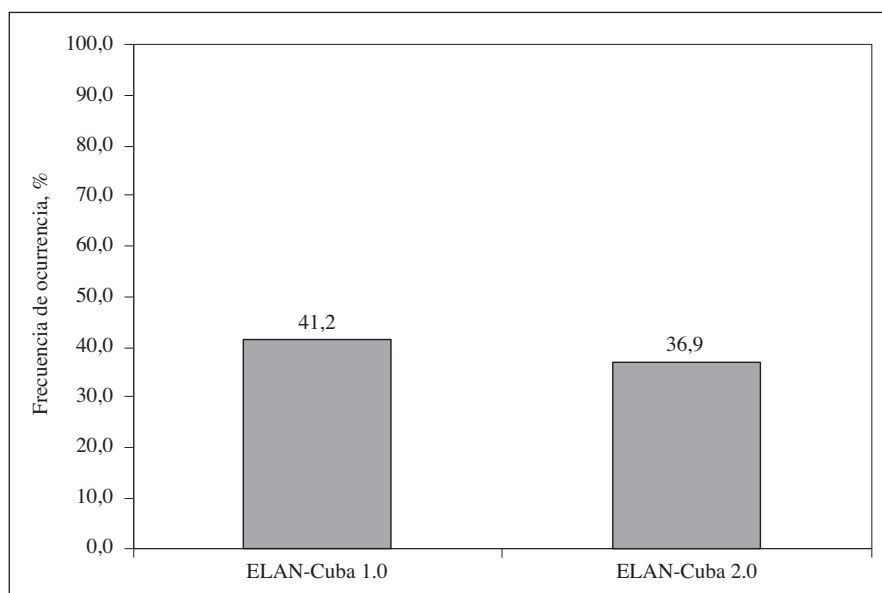
| Indication  | Findings      |                   |
|---|---------------|-------------------|
|   | ELAN Cuba 1.0 | ELAN Cuba 2.0     |
| Sample size   | 1,905         | 1,664             |
| Non-malnourished patients requiring oral nutritional supplementation to cover increased nutritional needs | 27.2          | 25.7              |
| Patients on <i>Nil-Per-Oris</i> at the time of the survey   | 3.4           | 11.0 <sup>§</sup> |
| Patients with fasting lasting > 5 days  | 6.2           | 4.1 <sup>§</sup>  |
| Patients with weight loss > 20%   | 10.9          | 9.0               |
| Patients with diagnosis of infection  | 25.1          | 27.2              |
| Patients with diagnosis of cancer   | 12.7          | 16.1 <sup>§</sup> |
| Patients with diagnosis of chronic organ disease: cardiac/kidney/respiratory/liver                        | 7.7           | 9.9 <sup>§</sup>  |
| Patients with a completed surgical plan   | 14.7          | 28.0 <sup>§</sup> |
| • Of them: Patients with > 5 days after surgery performed   | 37.3          | 42.5              |
| Patients with length of stay > 15 days  | 20.8          | 17.1 <sup>§</sup> |
| Patients with B/C scores after administering SGA  | 41.2          | 36.9 <sup>§</sup> |
| Median of values  | 10.7          | 16.6              |

<sup>§</sup> p < 0.05. Test for comparing independent proportions.  
 Sources: Records from the Cuban Study of Hospital Malnutrition.  
 Closing date: June 30<sup>th</sup>, 2014.

comparing independent proportions), and diagnosis of cancer (*ELAN CUBA 1.0*: 12.7% vs. *ELAN CUBA 2.0*: 16.1% ( $\Delta = -3.4\%$ ; p < 0.05; test for comparing independent proportions) and/or chronic organic disease (*ELAN CUBA 1.0*: 7.7% vs. *ELAN CUBA 2.0*: 9.9% ( $\Delta = -2.2\%$ ; p < 0.05; test for comparing independent proportions).

A modest (albeit significant) reduction in the number of the patients with hospital length of stay > 15 days: *ELAN CUBA 1.0*: 20.8% vs. *ELAN CUBA 2.0*: 17.1% ( $\Delta = +2.3\%$ ; p < 0.05; test for comparing independent proportions was observed).

Table V shows the state of completion of hospital exercises of nutritional assessment. During the time



*Fig. 1.—Historical behavior of malnutrition in hospitals of Cuba. Sources: Records of the Cuban Study of Hospital Malnutrition. Closing date: June 30<sup>th</sup>, 2014.*



**Table V**  
*Historical behavior of the completion of hospital exercises of nutritional assessment in patients surveyed for the Cuban ELAN Study of Hospital Malnutrition*

| Indicator  | Hallazgos     |                               |
|--|---------------|-------------------------------|
|  | ELAN Cuba 1.0 | ELAN Cuba 2.0                 |
| Sample size  | 1,905         | 1,664                         |
| <b>Standar 1.</b> Regarding nutritional assessment of the patient:   |               |                               |
| • There should be scales within less than 50 meters from the patient's bed.  | 82.3          | 95.0<br>$\Delta = +12.7^{\S}$ |
| • The patient should be measured and weighted on admission.  | 59.5          | 70.9<br>$\Delta = +11.4^{\S}$ |
| • <i>If present:</i> Diagnosis of malnutrition should be documented in the patient's Clinical chart any time within the first 72 hours following admission.                    | 0.4           | 4.4<br>$\Delta = +4.0^{\S}$   |
| • Basal values of serum Albumin should be recorded in the patient's clinical chart any time within the first 72 hours following admission.                                     | 10.1          | 33.5<br>$\Delta = +23.4^{\S}$ |
| • Basal Lymphocytes Counts should be recorded in the patient's clinical chart any time within the first 72 hours following admission.  | 13.2          | 39.0<br>$\Delta = +25.8^{\S}$ |
| • <i>In every patient with length of stay &gt; 15 days<sup>§</sup>:</i> Patient's weight should be regularly recorded. A weekly frequency of recording is recommended.         | 9.3           | 60.1<br>$\Delta = +50.8^{\S}$ |
| • <i>In every patient with length of stay &gt; 15 days<sup>§</sup>:</i> Serum Albumin values should be regularly recorded. A bimonthly frequency of recording is recommended.  | 10.3          | 37.4<br>$\Delta = +27.1^{\S}$ |
| • <i>In every patient with length of stay &gt; 15 days<sup>§</sup>:</i> Total Lymphocytes Counts should be regularly recorded. A weekly frequency of recording is recommended. | 17.1          | 24.7<br>$\Delta = +7.6^{\S}$  |

<sup>§</sup> Patients with hospital length of stay > 15 days: ELAN CUBA 1.0: 20.8%; ELAN CUBA 2.0%: 17.1%.

<sup>§</sup>p < 0.05. Test for comparing independent proportions.

Sources: Records of the Cuban Study of Hospital Malnutrition.

Closing date: June 30<sup>th</sup>, 2014.

elapsed between both surveys there was an increase in the number of scales available for anthropometric assessment of hospitalized patient, and the number of clinical charts with height and weight values taken on admission, a diagnosis of malnutrition included within the patient's health problems; and the values of biochemical indicators of nutritional status such as serum Albumin and Total Lymphocyte Counts.

Finally, Table VI shows the rate of use of nutritional replenishment (Enteral and/or Parenteral) techniques in surveyed subjects. Regarding the ELAN CUBA Study version 1.0 (completed during the 1999-2001 term), a modest increase in nutritional coverage of the patients included in any of the 10 categories of nutritional support was found.

## Discussion

The Cuban Study of Hospital Malnutrition, conducted by the Cuban Group for the Study of Hospital

Malnutrition as an on-going enquiry, has served firstly to establish the current state of malnutrition in health care institutions of the country admitting patients; and secondly, to assess the behavior of this indicator in response to changes occurring in the ways food and nutritional care is provided to the hospitalized patient.

Malnutrition rate in Cuban hospitals has remained invariant during the time elapsed between the two editions of the ELAN CUBA Study. The observed reduction in the latest estimate of this health problem, although numerically significant, does not provide any ground to assure it represents an important change in the current state of the affairs.

The present study did not intend to exam probable causes of any numerical change that might occur in the rate of hospital malnutrition. For some ones, observed change might be the result of an increased number of patients with an excessive body weight. It is not to be ignored that prevalence of excessive body weight in the Cuban population has experienced a dramatic rise in the last 30 years, and that obesity (the most extreme

**Tabla VI**  
*Historical behavior of the use nutritional replenishment therapies in patients surveyed in the Cuban ELAN Study of Hospital Malnutrition*

| <i>Indicator</i>   | <i>Findings</i>  |  |
|--|--|--|
|  | <i>ELAN Cuba 1.0</i>   | <i>ELAN Cuba 2.0</i>   |
| Sample size  | 1,905  | 1,664  |
| <b>Standard 3.</b> Regarding the use of dietetic supplements:  |  |  |
| <ul style="list-style-type: none"> <li>• Non malnourished patients with increased nutritional demands subjected to oral nutritional supplementation.</li> </ul>  | 5.7  | 8.7<br>$\Delta = +3.0$   |
| <b>Standard 4.</b> Regarding the need of nutritional intervention:   |  |  |
| <ul style="list-style-type: none"> <li>• Patients on <i>Nil-Per-Oris</i> at the time of the survey having installed any kind of nutritional support scheme.</li> <li>• Patients with fasting lasting &gt; 5 days having installed any kind of nutritional support scheme.</li> <li>• Patients with weight loss &gt; 20% having installed any kind of nutritional support scheme.</li> <li>• Patients with a diagnosis of infection having installed any kind of nutritional support scheme.</li> <li>• Patients with a diagnosis of cancer having installed any kind of nutritional support scheme.</li> <li>• Patients with a completed surgical program having installed any kind of nutritional support scheme.</li> <li>• Patients with &gt; 5 days after a surgery performed having installed any kind of nutritional support scheme.</li> <li>• Patients with &gt; 15 days of hospital length of stay having installed any kind of nutritional support scheme.</li> <li>• Patients with a diagnosis of a chronic organ disease (cardiac/kidney/respiratory/liver) having installed any kind of nutritional support scheme.</li> <li>• Patients with B/C scores after administering SGA having installed any kind of nutritional support scheme.</li> </ul> | 32.3<br>13.4<br>4.8<br>5.0<br>4.5<br>6.8<br>7.8<br>4.8<br>0.0<br>4.2 | 53.4<br>$\Delta = +21.1^{\S}$<br>31.7<br>$\Delta = +18.3^{\S}$<br>9.8<br>$\Delta = +5.0$<br>10.5<br>$\Delta = +5.5^{\S}$<br>15.0<br>$\Delta = +10.5^{\S}$<br>26.5<br>$\Delta = +19.7^{\S}$<br>19.4<br>$\Delta = +11.6^{\S}$<br>26.7<br>$\Delta = +21.9^{\S}$<br>5.5<br>$\Delta = +5.5^{\S}$<br>15.1<br>$\Delta = +10.9^{\S}$ |

Sources: Records of the Cuban Study of Hospital Malnutrition.  
 Closing date: June 30<sup>th</sup>, 2014.

form of this health problem) affects today almost a fifth of the Cuban population<sup>16</sup>.

Consequently, the possibility that a high prevalence of excessive body weight has influenced the current rate of hospital malnutrition is not to be dismissed at all. Scrutiny of the ELAN CUBA Study databases revealed that modest (although not significant yet) changes have occurred in the frequencies of excess of body weight and obesity among surveyed patients in both exercises (data not shown). In spite of this, it is not to be bypass that a disproportionate presence of body fat might concur with micronutrient deficiencies such as iron, zinc and folic acid; anemia, inflammation, infection and sepsis, and even depletion of body lean mass. The term “sarcopenic obesity” has been coined for naming this phenotype singularity which ultimately is no other thing than a patient that is malnourished | at risk of being in view of the circumstances he/she is suffering.

In a way, invariance of hospital malnutrition might have been anticipated. Like any other indicator of health management<sup>17</sup>, malnutrition rate is subjected to (and compounds) several influences of any kind, ranging from the demographic and clinical features of the hospitalized patient (particularly relevant to the Cuban population experiencing a process of accelerated aging); to the ways in which hospital organizations for providing food and nutritional care operate. Given the aforementioned, it might have been premature to forecast a significant reduction (10 percentage points at least) of the hospital malnutrition prevalence after only 10 years. It is possible then that current prevalence of malnutrition in the hospital might be the one distinguishing a population in which cancer, infection and chronic organ diseases concur; where those ones with ages  $\geq 60$  years represent more than a third of the surveyed ones; and in which those consuming 7 days (or more) of hospital stay predominate.

Hospital malnutrition has also remained invariant in the ibero-latin-american area, if one is to judge from recently published reports. The PREDyCES Study concluded that a quarter of hospitalized patients in Spain was malnourished<sup>18</sup>. Surveys completed in hospitals of Portugal, Brazil and Peru, using tools different from SGA, have been consistent in revealing that between a third and a half of the admitted patients might be malnourished<sup>19-21</sup>; and that hospital malnutrition affects hospital length of stay, course of the patient's disease, and response to surgical and medical treatment<sup>22</sup>.

Having said the aforementioned, it was more relevant for the GCEDH to assess if changes have occurred in the ways hospital processes of food and nutritional care are conducted, when during the elapsed time important developments have taken place in the practice of Food and Nutrition in the country. Institutionalization of a University Degree in Nutrition<sup>23</sup> made possible the staffing of hospitals with nutritionists empowered in the provision of food and nutritional care to the hospitalized patient<sup>12</sup>, and in charge of disseminating the "Good Practices of Food and Nutrition" in those institutions in which they practice through training and continuous education activities<sup>24</sup>.

During the elapsed decade a national network of hospital nutritional support groups was designed and implemented, capitalizing upon the pioneering experience of the one founded at the "Hermanos Ameijeiras" Clinical Surgical Hospital of the city of Havana. These groups have been charged with revealing the state of malnutrition in the containing institutions, and conducting (in keeping with the epidemiological situation found) intervention programs<sup>11</sup> aimed to secure the best nutritional status of the patient as a guarantee of the success of the administered therapy.

The Cuban Society of Clinical Nutrition and Metabolism has been particularly active in exposing the determinants and consequences of hospital malnutrition since its recognition as a public, non-governmental, not-for-profit organization, ascribed to the National Council of Health Scientific Societies. Hence, local chapters of the Society have been constituted in 10 out of the 15 provinces of the country, and national-reaching (one of them Latin American in nature) congresses have been held without interruption since 2001<sup>‡</sup>.

Continuous education needs led to the rescue of the Cuban Journal of Food and Nutrition as a bi-annual digital vehicle for collecting, cataloging, treasuring and disseminating the experience accumulated by local nutritionists in the recognition and treatment of malnutrition associated with secondary to illness<sup>§,25</sup>.

<sup>‡</sup>For more details: Please go to: <http://www.nutricionclinica.sld.cu/Congresos.htm>.

<sup>§</sup>The Cuban Journal of Food and Nutrition has also accommodated contributions from Mexican, Argentinian, Colombian and Spanish authors, thus becoming a publication of regional reach.

In addition, the experience of Cuban authors has been accommodated indistinctly in Spanish, Portuguese and English languages in several regional and international, peer-reviewed, scientific journals. Thus, the GCEDH anticipated that all these developments might visibly influence upon the current features of hospital processes of food and nutritional care to hospitalized patient.

It was then gratifying to see a rise in the rates of use of nutritional replenishment therapies, especially in those subpopulations affected with cancer and chronic organ disease; those ones who were on *Nil-Per-Oris*, those experiencing an important weight loss, those accumulating 5 (or more) days of hospital fasting, and those evolving after surgery: evidences of a more active screening of hospital population by nutritionists teams searching for those at risk of malnutrition.

It could be argue that higher rates of use of nutritional replenishment therapies could be explain on the basis of their increased availability. While the Cuban National Health System offers the hospital nutritional support groups an essential portfolio of nutrients solutions and devices for vascular as well as enteral access as part of the so called "Vademecum of Basic Drugs", resources are still far from satisfying general and specialized demands of nutritional support<sup>8</sup>. So, presented results aim to a more efficacious use of available items. Future surveys could exam the behavior of the availability of resources and items for nutritional replenishment, their *in situ* use, and the repercussion of all these events upon the nutritional care of the patient.

Likewise, it was encouraging to see a higher rate of completion of hospital exercises of nutritional assessment, as a prerequisite for a better documentation of malnutrition as a health problem that needs to be recognized first to be intervened later. Others researchers, working in different geographical latitudes, have also reported the benefits of a higher recognition of malnutrition present in those hospitalized<sup>26-27</sup>.

However, it is not to be overlooked that observed advances in quality indicators of the food and nutritional care processes have been modests, and there still a long way to go until every patient receives in a timed manner the nutritional care he/she deserves in keeping with the surgical clinical condition he/she currently faces<sup>\*\*</sup>.

## Conclusions

Having elapsed 10 years of the first edition of the ELAN CUBA Study, hospital malnutrition rate re-

<sup>\*\*</sup>A low rate of recognition of hospital malnutrition might likely lead to a poor recognition of this health problem, and this, in turn, might hinder a higher allocation of resources and items for nutritional intervention, thus compounding a sort of circular reference feeding on itself.



mains high. However, modest advances in the use of nutritional replenishment therapies and the completion of hospital exercises of nutritional assessment have been observed. Reported findings might constitute the first evidences of the impact of the presence of qualified nutritionists by the side of the bed of the patient, in charge with implementing “Good Practices for Food and Nutrition”, and of the activity of the Cuban Society of Clinical Nutrition and Metabolism as a promoter of the development of the sciences of Food and Nutrition in the country.

## Addendum

The supplement to the second (closing) number of the 23th volume of the Cuban Journal of Food and Nutrition contains the reports with the state of hospital malnutrition as found in the participating centers during the activities of the ELAN CUBA Study<sup>28</sup>. Those interested should go to: [http://www.reviculturamentanut.sld.cu/Vol\\_23\\_2\\_Suplemento.htm](http://www.reviculturamentanut.sld.cu/Vol_23_2_Suplemento.htm)

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## References

- Correia MITD, Campos ACL, for the ELAN Cooperative Study Prevalence of Hospital Malnutrition in Latin America: The Multicenter ELAN Study. *Nutrition* 2003;19:823-5.
- Wyszynski DF, Perman M, Crivelli A. Prevalence of hospital malnutrition in Argentina. Preliminary results of a population-based study. *Nutrition* 2003;19:115-9.
- Kehr J, Aguayo G, Morales B, Campano M, Aranda W, Waitzberg DL. Chilean Survey of Hospital Nutritional Status. Poster P0008. Abstracts of the 24<sup>th</sup> ASPEN Clinical Congress. *JPEN J Parenter Enteral Nutr* 2000;24(Suppl):S14.
- Barreto Penié J, for the Cuban Group for the Study of Hospital Malnutrition. State of malnutrition in Cuban hospitals. *Nutrition* 2005;21:487-97.
- Barreto Penié J, por el Grupo de Estudio de la Desnutrición Hospitalaria en Cuba. Estado de la desnutrición en las instituciones hospitalarias cubanas. Publicación RNC sobre Nutrición Clínica 2005;14(2):49-67.
- Santana Porbén S, for the Cuban Group for the Study of Hospital Malnutrition. The state of the provision of nutritional care to hospitalized patients- Results from The ELAN-Cuba Study. *Clin Nutr* 2006;25:1015-29.
- Santana Porbén S, para el Grupo de Estudio de la Desnutrición Hospitalaria en Cuba. Estado de la provisión de cuidados alimentarios y nutricionales al paciente hospitalizado. Resultados del Estudio ELAN-CUBA. Publicación RNC sobre Nutrición Clínica 2006;15(4):115-123.
- Santana Porbén S. Estado de la Nutrición artificial en Cuba. Lecciones del Estudio Cubano de Desnutrición hospitalaria. Publicación RNC sobre Nutrición Clínica 2009;17:37-47.
- Santana Porbén S, para el Grupo de Estudio de la Desnutrición hospitalaria en Cuba. Estado de la prescripción dietética en los hospitales cubanos ¿A cada quién según sus necesidades? Publicación RNC sobre Nutrición Clínica 2009;18(3):69-84.
- Landrove O, Gámez AI. Transición epidemiológica y las enfermedades crónicas no transmisibles en las Américas y en Cuba: El programa de intervención cubano. Reporte Técnico de Vigilancia 2005;10(6):1-18.
- Sociedad Cubana de Nutrición Clínica y Metabolismo. Formas hospitalarias de provisión de cuidados nutricionales al enfermo. Resúmenes de las ponencias presentadas en un Taller de Expertos. *RCAN Rev Cubana Aliment Nutr* 2011;21(2 Supl):S1-S94.
- González Domínguez A, Bell Benavides Z, Pérez Santana M, Jiménez Sosa AM, Santana Porbén S. Sobre las competencias de los nutricionistas en los ámbitos hospitalarios y comunitarios. *RCAN Rev Cubana Aliment Nutr* 2011;21:159-74.
- PNO 2.011.98: Evaluación Subjetiva Global del paciente hospitalizado. Manual de Procedimientos. Grupo de Apoyo Nutricional. Hospital Clínico quirúrgico “Hermanos Ameijeiras”. Tercera Edición. La Habana: 2012.
- PNO 5.151.00: Encuesta de Nutrición Hospitalaria. Manual de Procedimientos. Grupo de Apoyo Nutricional. Hospital Clínico quirúrgico “Hermanos Ameijeiras”. Tercera Edición. La Habana: 2012.
- Santana Porbén S, Martínez Canalejo H. Manual de Procedimientos Bioestadísticos. Segunda Edición. EAE Editorial Académica Española. ISBN-13: 9783659059629. ISBN-10: 3659059625. Madrid: 2012.
- Acosta Jiménez SM, Rodríguez Suárez A, Díaz Sánchez ME. La obesidad en Cuba. Una mirada a su evolución en diferentes grupos poblacionales. *RCAN Rev Cubana Aliment Nutr* 2013;23(2):297-308.
- Pencheon D. The good indicators guide: understanding how to use and choose indicators. APHO Association of Public Health Observatories. NHS National Health System Institute for Innovation and Improvement. Londres: 2008.
- Álvarez-Hernández J, Planas Vila M, León-Sanz M, García de Lorenzo A, Celaya-Pérez S, García-Lorda P, Araujo K, Sar-to Guerri B; for the PREDyCES researchers. Prevalence and costs of malnutrition in hospitalized patients. The PREDyCES Study. *Nutr Hosp* [España] 2012;27:1049-59.
- Ferreira C, Lavinhas C, Fernandes L, Camilo M, Ravasco P. Nutritional risk and status of surgical patients: The relevance of nutrition training of medical students. *Nutr Hosp* [España] 2012;27:1086-91.
- Lisboa da Silva D, Alves Santos P, Coelho Cabral P, Pessoa de Araujo Burgos MG. Nutritional screening in clinical patients at a University Hospital in Northeastern Brazil. *Nutr Hosp* [España] 2012;27:2015-9.
- Veramendi Espinoza LE, Zafra Tanaka JH, Salazar Saavedra O, Basilio Flores JE, Millones Sánchez E, Pérez Casquino GA; et al. Prevalence and associated factors of hospital malnutrition in a general hospital: Perú, 2012. *Nutr Hosp* [España] 2013;28:1236-43.
- de Luis DA, Culebras JM, Aller R, Eiros-Bouza JM. Surgical infection and malnutrition. *Nutr Hosp* [España] 2014;30:509-13.
- Díaz Lorenzo T, González Domínguez A, Calzadilla Cambará A, Morejón Martín P, Fleitas A, Rodríguez Suarez A, Portal Pineda J. Organización del proceso docente de la Licenciatura de Nutrición en Cuba. *RCAN Rev Cubana Aliment Nutr* 2011;21:110-20.
- Santana Porbén S, Barreto Penié J. Programa de Intervención en Nutrición hospitalaria: Acciones, diseño, componentes, implementación. *Nutr Hosp* [España] 2005;20: 351-7.
- Santana Porbén S. La reaparición de la Revista Cubana de Alimentación y Nutrición [Editorial]. *RCAN Rev Cubana Aliment* 2007;17:6-7.
- Gómez Candela C, Serrano Labajos R, García Vázquez N, Valero Pérez M, Morato Martínez M, Santurino Fontecha C, González Madroño A, Palma-Milla S; para la Comisión de

- Nutrición del Hospital Universitario “La Paz”. Complete process of implantation of a nutritional risk screening system in the University Hospital La Paz, Madrid. *Nutr Hosp* [España] 2013;28:2165-74.
27. Villalobos Gámez JL, González Pérez C, García Almeida JM, Martínez Reina A, Del Rfo Mata J, Márquez Fernández E; et al. INFORNUT® Process improves accessibility to diagnosis and nutritional support for the malnourished hospitalized patient. Impact on management indicators. Two-year assessment. *Nutr Hosp* [España] 2014;29:1210-23.
28. Grupo Cubano de Estudio de la Desnutrición Hospitalaria. La desnutrición hospitalaria en Cuba: 10 años después. Los resultados del Estudio Cubano de Desnutrición Hospitalaria. *RCAN Rev Cubana Aliment Nutr* 2013;23(2 Supl):S1-S74.