



Trabajo Original

Nutrición en el anciano

Prevalence of malnutrition in subjects over 65 years of age in the Community of Madrid. The DREAM + 65 Study

Prevalencia de desnutrición en sujetos mayores de 65 años en la Comunidad de Madrid. Estudio DREAM + 65

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Abstract

Introduction: Disease-related malnutrition (DRM) is a frequent community healthcare problem that predominantly affects adults over 65 years of age and increases morbidity and mortality rates, while also decreasing quality of life.

Objective: To study the prevalence of DRM in adults over 65 in different community healthcare centres belonging to the Regional Social Welfare Service of the Community of Madrid.

Methods: We conducted a cross-sectional study in 33 community healthcare centres in Madrid (6 primary healthcare centres (PC), 9 care centres for the elderly (CE), 9 hospitals (H) and 9 nursing homes (NH)) selected by means of multistage sampling. The variables studied were age, sex, level of dependence according to the Red Cross disability scale, reason for admission and underlying disease, habitat (urban-periurban-rural) and geographical distribution (north-centre-south). The Mini Nutritional Assessment (MNA-screening) was employed as a nutritional screening tool in all the centres. In the case of patients with positive screening (at risk-malnutrition), the MNA-assessment was carried out. Statistical analysis was conducted with the SPSS 21.0 package and included descriptive statistics, Chi-square test and Fisher's exact test, one-way ANOVA, Kruskal-Wallis test and univariate and multivariate binary logistic regression analysis (LR). Statistical significance was considered to be $p < 0.05$.

Results: A total of 1,103 subjects were recruited (275 PC, 278 CE, 281 H, 269 NH), mean age 79.5 ± 8.4 years (41.2% were males and 58.8% females). The subjects from H and NH had a higher degree of disability ($p < 0.001$). The overall prevalence of DRM was 10%, 23.3% being at risk of malnutrition, with differences among the 4 types of community healthcare centres ($p < 0.001$). The univariate LR analysis showed significant differences in the prevalence of malnutrition according to age, sex, degree of dependence, type of community healthcare centre, habitat and geographical zone. Nevertheless, in the multivariate analysis, only the degree of dependence, the type of centre and habitat were statistically significant.

Conclusions: The prevalence of DRM in adults over 65 years of age in the Community of Madrid amounts to 10%, with another 23.3% at risk of malnutrition. The variables that were independently related with malnutrition in the multivariate analysis were only the patients' level of dependence and the type and setting of the community healthcare centre.

Key words:

Malnutrition. Nursing home. Community. Care centers. Hospitals.

Resumen

Introducción: la desnutrición relacionada con la enfermedad (DRE) es un problema sociosanitario frecuente que afecta preferentemente a los mayores de 65 años, que aumenta la morbimortalidad y disminuye la calidad de vida.

Objetivo: estudiar la prevalencia de DRE en mayores de 65 años en diferentes centros sociosanitarios del Servicio Regional de Bienestar Social de la Comunidad de Madrid.

Métodos: estudio transversal en 33 centros sociosanitarios de Madrid (6 centros de atención primaria [AP], 9 centros de mayores [CM], 9 hospitales [H] y 9 residencias [R]) seleccionados mediante muestreo polietápico. Las variables estudiadas fueron edad, sexo, nivel de dependencia según la escala de incapacidad de la Cruz Roja, motivo de ingreso y enfermedad de base, hábitat (urbano-periurbano-rural) y distribución geográfica (norte-centro-sur). Como herramienta de cribado nutricional se utilizó el Mini Nutritional Assessment (MNA-cribaje) en todos los centros. En los pacientes con cribado positivo (en riesgo-desnutrición) se realizó el MNA-evaluación. El estudio estadístico se realizó con el paquete SPSS 21.0 e incluyó estadística descriptiva, test de Chi-cuadrado y prueba exacta de Fisher, ANOVA de un factor, Kruskal-Wallis y análisis de regresión logística (RL) binaria univariante y multivariante. Se consideró significación estadística $p < 0,05$.

Resultados: se reclutaron 1.103 sujetos (275 AP, 278 CM, 281 H, 269 R), edad media de $79,5 \pm 8,4$ años (41,2% varones, 58,8% mujeres). Los sujetos procedentes de H y R tuvieron un mayor grado de incapacidad ($p < 0,001$). La prevalencia global de DRE fue del 10%, encontrándose un 23,3% en riesgo de desnutrición, con diferencias entre los cuatro tipos de centros sociosanitarios ($p < 0,001$). El análisis univariante de RL mostró diferencias significativas en la prevalencia de desnutrición según la edad, sexo, grado de dependencia, tipo de centro sociosanitario, hábitat y zona geográfica. Sin embargo, en el análisis multivariante solo el grado de dependencia, el tipo de centro y el hábitat tuvieron significación estadística.

Conclusiones: la prevalencia de DRE en mayores de 65 años en la Comunidad de Madrid es del 10%, encontrándose además un 23,3% en riesgo de desnutrición. Las únicas variables que se relacionaron de forma independiente con la desnutrición en el análisis multivariante fueron el nivel de dependencia de los pacientes y el tipo y hábitat de centro sociosanitario.

Palabras clave:

Desnutrición. Geriátrico. Comunidad. Residencias. Hospitales.

Received: 06/12/2015

Accepted: 25/01/2016

Ver Editorial en páginas 201-2.

Cuerda C, Álvarez J, Ramos P, Abánades JC, García-de-Lorenzo A, Gil P, de-la-Cruz JJ. Prevalence of malnutrition in subjects over 65 years of age in the Community of Madrid. The DREAM+65 Study. Nutr Hosp 2016;33:263-269

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INTRODUCTION AND AIMS

Disease-related malnutrition (DRM) is a frequently occurring community healthcare problem that predominantly affects those over 65 years of age. It has an effect on increasing morbidity and mortality rates; it lowers the quality of life, extends hospital stays and raises the costs of caring for subjects suffering from it (1-6). It is common at all levels of healthcare, from primary to specialised care and in geriatric care centres, and its growing relation with the progressive ageing of the population is considered to be very important. It is a fact that malnutrition is the greatest and most frequent cause of disability in geriatric population living in their own home or at institutions (7-10).

According to the 2014 census conducted by the Institute of Statistics of the Community of Madrid (11), 16.3% of the population of Madrid (1,051,060) is over 65 years of age, almost 3% below the national mean (18.2%). The population forecast made by the Official National Statistics (INE) (12) for the coming years show a considerable increase in this age group of population, with mean national values of 24.9% forecast for 2029 and 38.7% for 2064.

During the course of the ageing process, a number of hormonal and other changes take place in body composition, there is a loss of bone mineral density and of proprioception, a deterioration of the functioning of the senses that, together with factors of a psychosocial and medical nature, as well as the use of polypharmacy, can lead to an inadequate ingestion and contribute to the deterioration of the nutritional status, triggering malnutrition (13).

Recently, data from Nutrition Day obtained in nursing homes have shown that the involuntary weight loss, *i.e.* > 5 kg in one year, or a drop in BMI (Body mass index) < 20 kg/m² has been related with an increased mortality rate at 6 months (14).

The prevalence of DRM among elderly varies greatly according to the level of healthcare and the type of instrument used to identify it. Several international studies have offered figures between 15%-40% in nursing homes, 5%-8% at home, 45% in patients admitted to hospital medical services and up to 65% in surgical services (2-5,10,14-16).

Early identification of subjects at risk of malnutrition and those who are already undernourished in different healthcare settings, together with their nutritional management, is essential to be able to minimise the deleterious effects of malnutrition and its negative impact on healthcare spending and the sustainability of the system (17-19). The European Society for Clinical Nutrition and Metabolism (ESPEN) recommends the Mini Nutritional Assessment (MNA) as the screening (MNA-screening) and assessment (MNA-assessment) instrument in patients over the age of 65 years (20).

The main aim of our study (*Disease-related malnutrition in the elderly aged over 65 years in Madrid, DREAM + 65*) was to study the prevalence of DRM in this population at different community healthcare centres of the Regional Social Welfare Service of the Community of Madrid. The secondary aim was to study the differences in the risk of malnutrition according to sex, age, level of dependence, habitat and geographical distribution.

METHODS

STUDY DESIGN

Cross-sectional, multi-centre study conducted to determine the prevalence of malnutrition in primary healthcare centres (PC), care centres for the elderly (CE), hospitals and nursing homes (NH) located at the Community of Madrid, Spain.

The eligibility criteria were the following: age 65 years or older, being treated in community healthcare services in the Community of Madrid and participants (or their relatives) having given their consent to participate in the study. Exclusion criteria were lack of consent or cognitive impairment of subjects without any caregivers able to answer the survey on their behalf.

Patients were recruited between June and July, 2014. At the PC and CE centres, subjects were recruited according to their consecutive visit. In hospitals, patients were consecutively included following their admission into the Geriatric Services (or Internal Medicine if the centres did not have a Geriatric Service). In NH, the subjects were randomly included.

SAMPLE SIZE PREDETERMINATION AND MULTISTAGE SAMPLING

The sample size needed to estimate a percentage was calculated assuming a prevalence of malnutrition of 50% (a scenario that requires a larger sample size) and 4% accuracy. Thus, the minimum number of patients would be 217. Bearing in mind that possible losses could amount to 20%, the total size to be sampled was 272 subjects.

The participating centres that were deemed eligible for inclusion were selected based on multistage sampling, with a first phase of fixed assignation for each of the four settings of study (PC, CE, hospitals and NH). In this case the assignation is 272 surveys to be sampled in each of them.

In the second stage, we divided the centres in each area by type of setting and geographical zone, according to INE data from the 2011 Spanish census. According to the census, 9.5% of the population lives in a rural setting (towns with < 30,000 inhabitants), 40.1% live in periurban settings (between 30,000 and 500,000 inhabitants) and 50.3% live in an urban area (> 500,000 inhabitants, only Madrid capital). Therefore, for the sample, and with the aim of ensuring that each setting was represented in the sample, data were collected at 9 centres for each of them, 4 urban, 4 periurban and 1 rural, while at the same time attempting to distribute them evenly across the northern, southern and central zones.

Hence, to achieve the minimum sample of 272 subjects for each area, a total of 31 surveys had to be answered at each of the 9 randomly chosen centres, which would result in a sample of 279 surveys in each area, giving a total of 1,116.

VARIABLES STUDIED

The variables under study were age, sex and level of dependence according to the Red Cross disability scale. Moreover, in

the case of patients who were treated in hospital, the reason for admission and the most relevant underlying pathology were also collected. The MNA-screening test was used as the nutritional screening instrument in all the centres. Patients with positive screening on the MNA-screening (at risk-malnutrition, score < 12 points) also had to complete the MNA-assessment test. Subjects were considered to be undernourished if they presented a score < 17 points on the MNA-assessment and to be at risk if they had a score between 17 and 23.5 points. Furthermore, the MNA-assessment test was performed in all the patients from hospitals and NH as part of the study protocol.

All the data provided by patients and/or their relatives was collected by the principal investigators at each centre, with the aim of unifying the measurements and avoiding variability in the tests.

STATISTICAL STUDY

In descriptive statistics, qualitative variables are shown as absolute and relative frequency denoted by "n" and "%". For the prevalence estimate of malnutrition (main variable under study), 95% confidence intervals of the percentages are shown both in the total sample and by comparison groups. For quantitative variables, Kolmogorov-Smirnov test for goodness-of-fit for the normal distribution was carried out first. Because age was approximately "normally distributed" the values of mean and standard deviation were given. The scores of the MNA questionnaires did not approach the Gauss curve and thus median and interquartile range were shown.

The differences among the areas, habitat and geographical distribution for the percentages of the different answers and nutrition groups were performed by means of Pearson's Chi-square test. If small samples were found (20% or more of the cells with an expected frequency less than 5), Fisher exact test for 2 x 2 tables was performed and if more than two categories were compared, then, continuity correction was carried out. For quantitative variables, the differences in age were calculated with one-way ANOVA and using Kruskal-Wallis test on the MNA scores.

Moreover, univariate and multivariate binary logistic regression analysis were performed, with malnutrition (no vs. yes) as the dependent variable, using the stepwise forward method.

In all the analysis a statistical significance level of at least 95% was considered, that is to say, values of $p < 0.05$. All analyses were performed using the SPSS (Statistical Package for the Social Sciences) software package, version 21.0. Chicago: SPSS Inc.

ETHICAL ASPECTS

The study protocol was approved by the Central Research Commission of Madrid Health Service and by the CIEC (Clinical Research and Ethics Committee) of the Hospital Puerta de Hierro, Majadahonda. Patients included in the study signed an informed consent form. Compliance with Spanish Organic Law 15/1999 dated 13th December, on the Protection of Personal

Data, for handling dissociated personal data was ensured at all times.

RESULTS

Altogether, 1,103 subjects were recruited from 33 community healthcare centres in the Community of Madrid. Of these subjects, 275 came from PC centres (6 PC centres), 278 from CE (9 CE), 281 from hospitals (9 hospitals) and 269 from (9 NH). The mean age was 79.5 ± 8.4 years. The patients treated in hospitals and NH were older ($p < 0.001$). Of the total number of respondents, 41.2% were males and 58.8% were females, without any differences according to level of healthcare. The reason for admission and the main underlying pathology in hospitalised subjects can be seen in figure 1.

The subjects from hospitals and NH had a higher degree of disability ($p < 0.001$) (Fig. 2).

MNA-screening was performed in all the subjects and in 619 cases the MNA-assessment was also used to complete the tests (50 cases in PC, 19 in CE, as well as in all the patients from hospitals (281) and NH (269)). The results of the MNA-screening test can be seen in table I.

In addition, 23.3% (257) of the studied subjects were at nutritional risk (a score of 17-23.5 on the MNA) and 10% (110) were undernourished (< 17 points on the MNA) (Table II). There was a difference in the prevalence of malnutrition-nutritional risk at different community healthcare centres, with much higher values being found in patients from hospitals and NH ($p < 0.001$). In the analysis by sex and age, prevalence of malnutrition was higher in women ($p < 0.001$) and in subjects < 80 years of age ($p < 0.001$).

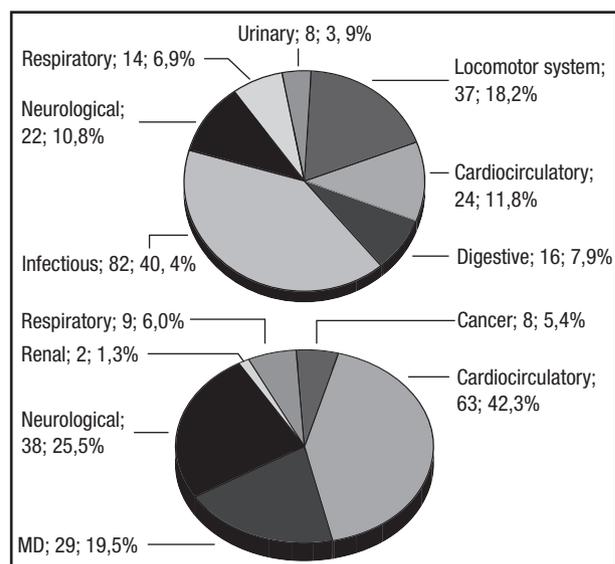


Figure 1.

Upper graph: Pathology that led to admission to hospital (203/281 patients, 72.2%). Lower graph: Most relevant underlying condition in hospitalised subjects (149/281, 53%).

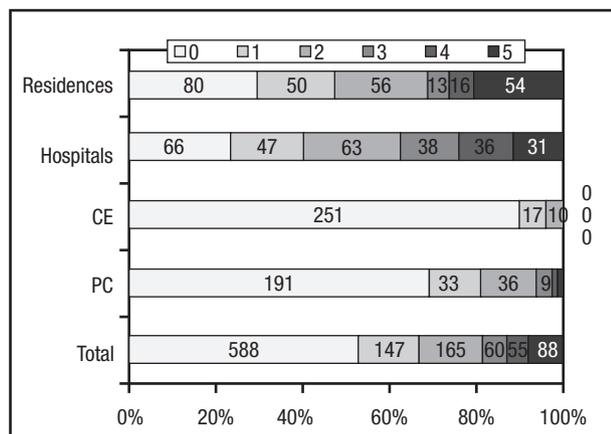


Figura 2. Distribution of patients by degrees of dependence in the different community healthcare centres ($p < 0.001$). NH: Nursing homes; CE: Care centers for elderly; PC: primary healthcare centers. Degrees of dependence: a higher score indicates higher disability.

Moreover, the prevalence of malnutrition was much higher in subjects with a greater degree of disability ($p < 0.001$). In contrast, there were no differences in the prevalence of malnutrition in hospitalised subjects according to the reason for admission. Malnutrition was more frequent in hospitalised patients with cancer (25%), neurological conditions (47.4%) and kidney disease (50%) ($p < 0.012$).

Differences were also found in the prevalence of malnutrition depending on habitat (urban, periurban and rural [$p < 0.012$]) and geographical distribution (north, centre and south [$p < 0.001$]).

The univariate logistic regression analysis showed significant differences in the prevalence of malnutrition according to age ($p < 0.001$), sex ($p < 0.008$), degree of dependence ($p < 0.001$), type of community healthcare centre ($p \leq .001$), habitat ($p < 0.05$) and geographical zone ($p < 0.05$) (Table III). Yet, in the multivariate analysis, only the degree of dependence ($p < 0.001$), the type of centre ($p < 0.008$) and habitat ($p < 0.05$) were statistically significant (Table IV). With a degree of certainty above 95%, the model showed that there was a relationship between malnutrition and the degree of dependence, as well as the different areas of study and habitat, adjusted for age and sex.

DISCUSSION

Few cross-sectional studies have been conducted to evaluate the prevalence of DRM across a population that embraces different levels of healthcare. In our study we obtained a prevalence of DRM of 10% in those over 65 years of age in the Community of Madrid, together with 23.3% at risk of malnutrition with very significant differences depending on the type of community healthcare centre.

In Spain several studies have been conducted to evaluate the prevalence of malnutrition in a hospital setting, with figures ranging between 12.5%-78.9% (21-24). The most important study on the prevalence of DRM carried out in our country was probably the PREDYCES study. In this study 1597 patients were evaluated only in the hospital setting (31 centres) and showed a risk of malnutrition (NRS 2002 ≥ 3) of 23.7% and of 37% among those over the age of 70. The most commonly affected patients were those with neoplastic diseases (35%), followed by those with disorders involving the cardiocirculatory (29%) and respiratory

Table I. Results of the MNA-screening

Type	Total	Primary care centres	Care centres for the elderly	Hospitals	Nursing homes	p
Normal: 12-14 points	725 (65.7)	225 (81.8)	259 (93.2)	95 (33.8)	146 (54.3)	< 0.001
Risk: 8-11 points	271 (24.6)	47(17.1)	17 (6.1)	117 (41.6)	90 (33.5)	
Malnutrition: 0-7 points	107 (9.7)	3 (1.1)	2 (0.7)	69 (24.6)	33 (12.3)	

Results are shown as absolute and relative frequencies (%).

Table II. Results of the MNA-complete

Type	Total	PC	CE	Hospitals	Nursing homes	p
Normal	736 (66.7) (63.9/69.5)*	239 (86.9) (82.9/90.9)	264 (95.0) (92.4/97.6)	89 (31.7) (26.3/37.1)	144 (53.5) (47.5/59.5)	< 0.001
Risk	257 (23.3) (20.8/25.8)	30 (10.9) (7.2/14.6)	13 (4.7) (2.2/7.2)	131 (46.6) (40.8/52.4)	83 (30.9) (25.4/36.4)	
Prevalence of malnutrition	110 (10.0) (8.2/11.8)	6 (2.2) (0.5/3.9)	1 (0.4) (0.0/1.1)	61 (21.7) (16.9/26.5)	42 (15.6) (11.3/19.9)	

PC: Primary care centres; CE: Care centres for the elderly. Results are shown as absolute and relative frequencies (%), with a confidence interval of 95%*.

systems (28%) (5). This study also concluded that the cost of hospitalisation increased by at least 50% in patients with malnutrition (6,572 Euros vs. 9,089 Euros/patient) and that the amount of time spent in hospital increased twofold in these cases.

In one multi-centre study that included 5051 hospitalised patients in 12 European and Middle Eastern countries, 32.6% of the patients were at nutritional risk (NRS 2002 \geq 3) and among geriatric patients the figure rose to 48%-57% (2).

Using the MNA screening-assessment instrument, our study showed the prevalence of malnutrition in hospitals and nutritional risk to be 21.7% and 46.6%, respectively. We also observed differences according to the underlying pathology, the most frequent being found in patients with cancer (25%), neurological conditions (47.4%) and kidney disease (50%). The prevalence of malnutrition in the community was much lower, values being 2.1% in primary healthcare centres and 0.4% in care centres for elderly, while the figures for nutritional risk were 10.9% and 4.7%, respectively. In nursing homes, the figures for malnutrition and nutritional risk were slightly lower than those in hospitals: 15.6% and 30.9%, respectively.

It is important to remember that in our study, as in an important number of studies conducted in geriatric populations, MNA was the instrument selected to evaluate the subjects, because of its easy implementation at all healthcare levels and its capacity for early detection of at-risk patients (20).

The data presented are in line with those published by Guigoz et al. (3), on more than 10,000 elderly, in which the prevalence

of malnutrition in healthy subjects in the community was 1%, 4% in subjects receiving homecare, 20% in hospitalised patients and up to 37% in patients who were institutionalised in nursing homes. The assessment method used was also the MNA.

The prevalence of malnutrition in non-hospitalised subjects has been studied in different areas of Spain with widely varying figures depending on the clinical setting and the screening tool employed (Table V) (25-31).

European studies also reflect this variability. A Norwegian community-based study using MNA-screening that included 6033 randomised subjects over the age of 65 found 13.5% of individuals to be at risk. One notable finding being that this risk increased with age (32).

A higher prevalence of malnutrition has also been reported in Dutch elderly individuals living in the community, especially those who required home care (35%). The same study also confirmed that the prevalence increased with age and was more frequent in females (33).

Results of a recent longitudinal study carried out in the population of 11 nursing homes in Sweden evaluated 318 subjects, showed 40.3% of the residents to be at risk of malnutrition and 17.7% undernourished, according to their assessment with MNA. After 24 months, the nutritional status of 38.7% of the participants had got worse (34).

Although in many of the previous studies the prevalence of malnutrition increased with age and was higher in women, these variables were not significant in the multivariate analysis in our study that shows that only the level of dependence, the type of community healthcare centre and the habitat were significant independent variables related with malnutrition. These data lend

Table III. Logistic regression. Univariate analysis

Independent variables	B	OR	(CI 95%)	p
<i>Sex (male vs. female)</i>	0.593	1.810	1.170-2.799	0.008
<i>Age (years)</i>	0.087	1.091	1.064-1.120	< 0.001
<i>Degree of dependence</i>				
<i>0 vs. 1</i>	1.429	4.173	1.539-11.312	0.005
<i>0 vs. 2</i>	1.825	6.201	2.524-15.231	< 0.001
<i>0 vs. 3 or more</i>	3.812	45.240	21.309-96.047	< 0.001
<i>Degree of dependence</i>				
<i>0 vs. (1 or more)</i>	2.848	17.254	8.304-35.850	< 0.001
<i>Field of research</i>				
<i>PC vs. CE</i>	- 0.420	0.657	0.109-3.963	0.647
<i>PC vs. hospitals</i>	3.385	29.509	9.161-95.059	< 0.001
<i>PC vs. nursing homes</i>	2.540	12.678	12.678-3.839	< 0.001
<i>Habitat</i>				
<i>Urban vs. periurban</i>	0.682	1.977	1.272-3.073	0.002
<i>Urban vs. rural</i>	0.680	1.973	1.040-3.743	0.038
<i>Geographical zone</i>				
<i>South vs. centre</i>	- 0.726	0.484	0.294-0.796	0.004
<i>South vs. north</i>	- 0.506	0.603	0.376-0.968	0.036

PC: Primary care centres; CE: Care centres for the elderly.

Table IV. Multivariate logistic regression analysis

Independent variables	B	OR	(CI 95%)	p
<i>Sex (male vs. female)</i>	0.342	1.407	0.845-2.342	0.189
<i>Age (years)</i>	- 0.019	0.981	0.981-1.016	0.283
<i>Degree of dependence</i>				
<i>0 vs. 1</i>	0.828	2.289	0.784-6.687	0.130
<i>0 vs. 2</i>	1.093	2.982	1.113-7.991	0.030
<i>0 vs. 3 or more</i>	2.945	19.003	7.826-46.145	< 0.001
<i>Field of research</i>				
<i>PC vs. CE</i>	0.114	1.120	0.176-7.113	0.904
<i>PC vs. hospitals</i>	2.451	11.603	3.402-39.574	< 0.001
<i>PC vs. nursing homes</i>	1.594	4.924	1.403-17.285	0.013
<i>Habitat</i>				
<i>Urban vs. periurban</i>	0.606	1.833	1.099-3.056	0.020
<i>Urban vs. rural</i>	0.558	1.747	0.975-3.840	0.065
<i>Geographical zone</i>				
<i>South vs. centre</i>	-	-	-	0.762
<i>South vs. north</i>	-	-	-	0.956

PC: Primary care centres; CE: Care centres for the elderly.

Table V. Prevalence of malnutrition in the elderly in the community and nursing homes in Spain

	N.º subjects	Setting	NST	Prevalence	Comments
Catalonia (25)	272	102 NH 170 HC	MNA	NH: 60.8% at risk, 32.4% MN H: 52.9% at risk, 14.7% MN	
Cantabria (26)	1,605	NH PC H	MNA	NH: 18.2% at risk, 4.1% MN PC: 13.1% at risk, 1.1% MN H: 2.3% at risk, 1% MN	
Murcia (27)	360	Non-institutionalized	Local validated tool	17% at risk, 3% MN	Higher prevalence in females and oldest ages
Orense (28)	728	Non-institutionalized	MNA	57.5% at risk, 12.5% MN	Higher prevalence in females and oldest ages
Spain (29)	1,320	Retail pharmacies	Determine	79.1% moderate or high nutritional risk	
Spain (30,31)	25,826	Retail pharmacies	MNA	22.5% at risk, 3.8% MN	Higher prevalence in females and oldest ages. Geographical differences*

NST: Nutrition screening Tool; NH: Nursing homes; HC: Home care; H: Home; PC: Primary care centres; MN: malnourished. *Higher prevalence in people from southern half and north-west of Spain.

support to those reported in other studies in which institutionalisation is considered a risk factor of malnutrition (35).

At this point we would like to highlight the strengths of our study, which was carried out on a broad sample of subjects aged over 65 who were treated in different types of community healthcare centres. The sample was obtained by means of multistage sampling and can be considered representative of the population of the Community of Madrid. Moreover, we have used the MNA as a nutritional screening-assessment instrument, which is the tool of choice in elderly population and makes it easier to perform comparisons with other similar national or international studies. Lastly, performing multivariate analysis has allowed us to highlight the variables that are independently related to malnutrition adjusted for age and sex.

However, we also acknowledge its limitations: there is a bias in the selection of subjects that was established by those who were unwilling to participate in the study (mainly by those who were in a hospital or a nursing home). Since the subjects in the other places were recruited immediately following their arrival, this bias may be kept to a minimum. Another limitation is the fact that patients who were treated at their home were not included in primary care, as we have seen to be the case in some of the European studies. Nevertheless, we understand that the profile of many of these patients may be similar to those of the patients admitted to nursing homes.

CONCLUSIONS

The prevalence of DRM in adults over 65 years of age in the Community of Madrid amounts to 10%, with another 23.3% at

risk of malnutrition. The variables that were independently related with malnutrition in the multivariate analysis were only the patients' level of dependence, the type of community healthcare centre and the habitat.

DREAM + 65 STUDY

Primary Healthcare Centres: Numancia: MD Martínez. Dr. Castroviejo: M Pérez. Santa Hortensia: C Vázquez. Miraflores: M Medina. La Princesa: MJ Revuelta. Navas del Rey: AM Arreche.

Care Centres for the Elderly: Villaverde Bajo: J Sánchez. Embajadores: JC Bando, H Hernández. Puente Toledo: S Garcera, J Sánchez, H Santiuste. Alcalá de Henares: E Álvarez. Tres Cantos: A Vicente. San Lorenzo de El Escorial: P Villodrós. Alcorcón: I Ruiz. Pinto: F Novalés. Los Cármenes: MI Álvarez

Nursing Homes: Dr. Gonzalez Bueno: O Rodríguez, V Rodríguez, JA Rodríguez, JI Robledo, E Martín. Vallecas: M López, I Salgado. La Paz: A Payno, A Chinea FJ Sanz, A Bautista-Abad. Goya: JL Vicente. Santiago Rusiñol: C González, A Malanga. San Fernando de Henares: JM Arroyo, E Aguado. Getafe: Giuliano Valdivia. Arganda del Rey: P Bañuelos, M Vicente, F Barreno, CJ Pivara. San Martín de Valdeiglesias: L San Celedonio.

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With the collaboration of Abbott Foundation.

ACKNOWLEDGEMENTS

We wish to thank the Regional Ministries of Social Affairs and Healthcare of the Community of Madrid, as well as the Spanish Geriatric and Gerontology Society, the Spanish Parenteral and Enteral Nutrition Society, and the Abbott Foundation for their collaboration and commitment to this study which is included within the Más Nutridos Project and Alliance (www.alianzamasnutridos.es).

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