

## Original Priority issues, study designs and geographical distribution in nutrition journals

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### Abstract

**Introduction:** The increased number of articles published in nutrition is a reflection of the relevance to scientific community. The characteristics and quality of nutritional studies determine whether readers can obtain valid conclusions from them, as well as their usefulness for evidence-based strategic policies.

**Objective:** To determine the characteristics of papers published in nutrition journals.

**Method:** Descriptive study design. We reviewed 330 original papers published between January-June 2007. From: American Journal of Clinical Nutrition (AJCN), Journal of Nutrition, European Journal Nutrition, European Journal of Clinical Nutrition and Public Health Nutrition. We classified them according to the subjects studied; risk factors, study design and country of origin.

**Results:** Almost half the papers studied healthy people (53.3%). The most frequent illness was obesity (13.9%). Food consumption is the most frequent risk factor (63.3%). Social factors appear exclusively only in 3.6% of the papers. Clinical trials were the most common analytical design (31.8%), mainly in the AJCN (45.6%). Cross-sectional studies were the most frequent type of observational design (37.9%). Ten countries produced over half of the papers (51.3%). The US publishes the highest number of papers (20.6%), whilst developing countries make only scarce contributions to scientific literature on nutrition.

**Conclusions:** Most of the papers had inferential power. They generally studied both healthy and sick subjects, coinciding with the aims of international scientific policies. However, the topics covered reflect a clear bias, prioritizing problems pertaining to developed countries. Social determinants of health should also be considered, along with behavioral and biological risk factors.

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### TEMAS PRIORITARIOS, DISEÑO DE ESTUDIOS Y DISTRIBUCIÓN GEOGRÁFICA DE ARTÍCULOS PUBLICADOS EN REVISTAS DE NUTRICIÓN

#### Resumen

**Introducción:** El crecimiento de la producción científica nutricional indica relevancia para la comunidad científica. Las características y calidad de los estudios determinan si sus lectores pueden obtener conclusiones válidas, y su utilidad en la orientación de estrategias políticas basadas en la evidencia.

**Objetivo:** Determinar las características de las publicaciones en revistas de nutrición.

**Método:** Estudio descriptivo. Se revisaron 330 artículos originales publicados entre enero-junio de 2007 en las revistas: American-Journal of Clinical-Nutrition (AJCN), Journal of Nutrition, European-Journal Nutrition, European-Journal of Clinical-Nutrition y Public-Health-Nutrition. Los artículos se clasificaron según los temas estudiados, factores de riesgo, diseño del estudio y país de origen.

**Resultados:** Las personas saludables representan la mitad (53,3%) de la población estudiada. La obesidad fue la enfermedad más frecuente (13,9%). El consumo de alimentos fue el factor de riesgo más frecuente (63,3%). Un 3,6% de artículos consideraron factores sociales. Los ensayos-clínicos fueron los estudios analíticos más comunes (31,8%), principalmente en AJCN (45,6%). Los estudios-transversales más frecuentes fueron observacionales (37,9%). Diez países producen más de la mitad de los artículos (51,3%). Los EEUU publican el mayor número de artículos (20,6%); siendo escasa la contribución de los países en desarrollo.

**Conclusiones:** La mayoría de los artículos presentan poder inferencial. La población estudiada se distribuye entre sana y enferma, coincidiendo con los objetivos de las políticas científicas internacionales. Sin embargo, los temas tratados reflejan un sesgo, dando prioridad a los problemas relativos a países desarrollados. Deberían considerarse determinantes sociales de la salud, junto con factores de riesgo de comportamiento y biológicos.

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Palabras clave: Prioridades de investigación. Estudios epidemiológicos. Epidemiología nutricional. Lugares geográficos. Salud pública. Nutrición.

## Introduction

The increased number of articles published on obesity since the 1980s, and in particular as from the year 2000, is a clear reflection of the relevance this health issue has within the scientific community.<sup>1,2</sup> The major research activity carried out on the 10 most important health risks, as recognized worldwide, provides important information on nutritional health problems, as 7 of the aforementioned risks are directly related to nutrition (underweight infants and pregnant women, overweight/obesity, hypercholesterolemia, high blood pressure, smoking, alcohol and iron deficiency).<sup>3,4</sup> The impact that the conclusions drawn up in this research may have depends on the type of study design used and the analysis carried out. Therefore, the characteristics and quality of nutritional studies determine whether readers can obtain valid and practical conclusions from them, as well as their usefulness for evidence-based strategic policies.<sup>5</sup>

Epidemiological study designs are widely used in all kinds of medical specializations.<sup>6</sup> Almost 10 years ago, it was concluded that there is a need for a review of scientific evidence within the field of nutrition in order to develop integrated and comprehensive national policies on food and nutrition.<sup>7</sup> However, despite the number of articles written on the characteristics of scientific papers published on medical specializations in general,<sup>8,9,10,11</sup> little has been published about nutrition journals.

The effective implementation of recommendations issued by international institutions will also depend on the origin of the new knowledge and on the area where it is to be applied, as, whilst increasingly homogeneous, food supply and dietary habits still vary according to geographical location.<sup>12</sup>

The aim of this study is to describe the frequency and characteristics of articles published in nutrition journals that are related to priority issues, type of epidemiological design and geographical location of the authors' country of origin.

## Methods

We selected the journals for analysis from the Institute for Scientific Information (ISI) Web of Knowledge Database, which contains a total of 55 journals within the Nutrition & Dietetics category. We included all journals with an impact factor of over 2.000 in the ISI ratings for the year 2006 ( $n = 23$  journals). After eliminating all journals dedicated to publishing reviews, proceedings, basic research and those specialized in one specific area (obesity, cancer or vitamins), 9 journals remained. Five predominant journals (2 from the US and its 2 European counterparts as well as the journal on public health) were selected for this study: American Journal of Clinical Nutrition (Am J Clin Nutr), The Journal of Nutrition (J Nutr), European Journal of Nutrition (Eur J Nutr), European Journal of

Clinical Nutrition (Eur J Clin Nutr) and Public Health Nutrition (Public Health Nutr).

All the original articles published in ordinary editions (no supplements) from January to June 2007 and based on clinical or community human research were included. The content of the full version of the selected papers was analyzed. Brief papers, case reports, letters to the editor, reviews, editorials and other sections that were not classified as original research were excluded as well as systematic reviews and meta-analyses.

The variables studied were:

### 1. Main topic of the article or pertinence:

#### 1.1. Study subjects (healthy or sick).

1.2. Type of illness studied in the case of research carried out on sick subjects, categorized in accordance with the International Classification of Diseases (ICD-10).<sup>13</sup>

1.3. Risk and associated factors studied (variable with non-excluding categories): Behavioral determinants, body composition and social factors. This variable contains non-excluding categories. Specifically, the category based on behavioral determinants and life styles includes articles on:

a) Food consumption related with: the assessment of dietary intake and nutritional behaviors; specific nutrients such as vitamins and minerals; macronutrients (proteins, fats and carbohydrates and their corresponding specific micro-elements such as amino acids, fatty acids, cholesterol and saccharides) and specific foods or food groups. Articles were also included on fast food intake, vegetarianism, frequency of meals, eating places and food purchasing behavior, as well as on the promotion and evaluation of breastfeeding.

b) Other lifestyle habits: physical activity (energy consumption and intensity), smoking and alcohol consumption.

The body composition category includes articles that cover anthropometric assessment (size, weight, folds and perimeters) and also those that refer to methodologies which detect changes in body composition and the evaluation of growth standards.

The social determinant category includes articles on all those aspects that are not directly controlled by individuals, i.e. social and economic, demographic, cultural, educational and political factors. It also includes the formulation, planning, implementation and evaluation of food and nutrition policies, action-plans and programs.

As many possible combinations of the aforementioned categories exist within one article regarding the risk/associated factor variable, 5 categories were created for the analysis: 1. Food consumption, 2. Body composition, 3. Social factors, 4. Body composition

**Table I**  
Priority issues in the original papers published in five scientific nutrition journals\* (January-June 2007)

Subjects/ Determinants	Food consumption		Body composition, Behavior and Social Factors		Food consumption Behavior and Social Factors		Body composition		Social Factors		Total	
	Frequency (%)	(%)	Frequency (%)	(%)	Frequency (%)	(%)	Frequency (%)	(%)	Frequency (%)	(%)	Frequency (%)	(%)
Healthy people	83 (47.16)	(52.20)	35 (19.89)	(41.67)	41 (23.30)	(82.00)	12 (6.82)	(48.00)	5 (2.84)	(41.67)	176 (100)	(3.33)
Obesity	8 (17.39)	(5.03)	29 (63.04)	(34.52)	0		6 (13.04)	(24.00)	3 (6.52)	(25.00)	46 (100)	(13.94)
Circulatory diseases	23 (76.67)	(14.47)	5 (16.67)	(5.95)	2 (6.67)	(4.00)	0		0		30 (100)	(9.09)
Endocrine, nutritional and metabolic diseases	9 (34.62)	(5.66)	6 (23.08)	(7.14)	4 (15.38)	(8.00)	5 (19.23)	(20.00)	2 (7.69)	(16.67)	26 (100)	(7.88)
Cancer	15 (68.18)	(9.43)	4 (18.18)	(4.76)	3 (13.64)	(6.00)	0		0		22 (100)	(6.67)
Digestive diseases	6 (75.00)	(3.77)	0		0		1 (12.50)	(4.00)	1 (12.50)	(8.33)	8 (100)	(2.42)
Diabetes	3 (42.86)	(1.89)	3 (42.86)	(3.57)	0		1 (14.29)	(4.00)	0		7 (100)	(2.12)
Intestinal infectious diseases	5 (100.00)	(3.14)	0		0		0		0		5 (100)	(1.52)
Mental and behavioural diseases	2 (50.00)	(1.26)	1 (25.00)	(1.19)	0		0		1 (25.00)	(8.33)	4 (100)	(1.21)
Skin and subcutaneous tissue diseases	4 (100.00)	(2.52)	0		0		0		0		4 (100)	(1.21)
Non classifiable	1 (50.00)	(0.63)	1 (50.00)	(1.19)	0		0		0		2 (100)	(0.61)
Total	159 (48.18)	(100)	84 (25.45)	(100)	50 (15.15)	(100)	25 (7.58)	(100)	12 (3.64)	(100)	330 (100)	(100)

\*Am J Clin Nutr, Eur J Clin Nutr, J Nutr, Eur J Nutr, Public Health Nutr.

plus behavior plus social factors and 5. Food consumption plus behavior plus social factors.

## 2. Type of study design

Epidemiological study designs: the epidemiological classification was carried out according to the Fletcher criteria<sup>14</sup> with slight modifications (see table IV). For this purpose, the design named in abstracts or in the material and methods section of papers was used. If the author(s) of the article had not specified the design, and using a technique used previously by our research group,<sup>15,16</sup> two researchers (LIGZ, MTRC) separately classified the articles in order to perform a simple concordance analysis, obtaining an agreement of 94.4%. When discrepancies arose, the opinion of a third evaluator (CAD) was necessary.

3. Country of origin of the authors. This was identified based on the origin of all the signing authors of the articles. For comparison purposes, the information is given for the ten countries which have published most articles, and the rest of the countries are grouped into their corresponding continents.

A descriptive study of the variables analyzed was carried out using the SPSS 14.0 statistical software.

## Results

53.3% (176 articles) of the papers reviewed represent research carried out on healthy populations and

46.1% on sick populations; mainly, obese population (13.9%), with circulatory (9.1%) and nutritional (7.9%) diseases and cancers (6.7%) (Table 1). The determining factors studied in the selected articles refer to food consumption (63.3%) and to a lesser degree to body composition (33%). A small number of articles (3.6%) focus exclusively on the social context as a nutritional determinant (table I).

The same table also shows that the healthy population is the main target group of research published on food consumption as a nutritional determinant together with behavioral and social factors (82%); although it is also considered as a sole factor (52%). However, the number of articles published on food consumption as a sole determining factor in relation to the obese population is extremely low (5%) and there are no articles related to social and behavioral factors for this sector at all. As regards food consumption as sole determining factor, circulatory diseases (76.7%) and cancer (68.2%) are the more prominent illnesses studied.

Body composition together with behavioral and social factors as nutritional determinants are more frequently found in articles based on obese population studies (63%) than in articles on healthy populations (20%). This difference is also observed, although to a lesser extent, when body composition is considered as a sole nutritional determinant (13% in obese population vs. 6.8% in a healthy population).

Table II shows that the Am J Clin Nutr is the journal that publishes the most diverse range of health-related topics, whilst the Publ Health Nutr and the J Nutr publish

**Table II**  
Subject characteristics of the original papers published in five scientific nutrition journals (January-June 2007)

	<i>Am J Clin Nutr</i>		<i>Eur J Clin Nutr</i>		<i>J Nutr</i>		<i>Eur J Nutr</i>		<i>Public Health Nutr</i>		<i>Total</i>	
	<i>Frequency (%)</i>	<i>(%)</i>	<i>Frequency (%)</i>	<i>(%)</i>	<i>Frequency (%)</i>	<i>(%)</i>	<i>Frequency (%)</i>	<i>(%)</i>	<i>Frequency (%)</i>	<i>(%)</i>	<i>Frequency (%)</i>	<i>(%)</i>
Healthy people	44 (25)	(42.72)	38 (21.59)	(46.91)	38 (21.59)	(62.3)	4 (2.27)	(40)	52 (29.55)	(69.33)	176 (100)	(53.33)
Obesity	17 (36.96)	(16.5)	16 (34.78)	(19.75)	3 (6.52)	(4.92)	1 (2.17)	(10)	9 (19.57)	(12)	46 (100)	(13.94)
Circulatory diseases	16 (53.33)	(15.53)	5 (16.67)	(6.17)	4 (13.33)	(6.56)	4 (13.33)	(40)	1 (3.33)	(1.33)	30 (100)	(9.09)
Endocrine, nutritional and metabolic diseases	2 (7.69)	(1.94)	9 (34.62)	(11.11)	7 (26.92)	(11.48)	1 (3.85)	(10)	7 (26.92)	(9.33)	26 (100)	(7.88)
Cancer	11 (50)	(10.68)	3 (13.64)	(3.7)	4 (18.18)	(6.56)	0		4 (18.18)	(5.33)	22 (100)	(6.67)
Digestive diseases	5 (62.5)	(4.85)	2 (25)	(2.47)	1 (12.5)	(1.64)	0		0		8 (100)	(2.42)
Diabetes	1 (14.29)	(0.97)	4 (57.14)	(4.94)	1 (14.29)	(1.64)	0		1 (14.29)	(1.33)	7 (100)	(2.12)
Intestinal infectious diseases	2 (40)	(1.94)	1 (20)	(1.23)	2 (40)	(3.28)	0		0		5 (100)	(1.52)
Mental and behavioural disorders	2 (50)	(1.94)	2 (50)	(2.47)	0		0		0		4 (100)	(1.21)
Skin and subcutaneous tissue diseases	3 (75)	(2.91)	0		1 (25)	(1.64)	0		0		4 (100)	(1.21)
Non classifiable	0		1 (50)	(1.23)	0		0		1 (50)	(1.33)	2 (100)	(0.61)
Total	103 (31.21)	(100)	81 (24.55)	(100)	61 (18.48)	(100)	10 (3.03)	(100)	75 (22.73)	(100)	330 (100)	(100)

a large number of articles on healthy populations, 69.3% and 62.3% of their articles, respectively. More specifically, the highest percentage of studies on obesity are published in the clinical nutrition journals—the Eur J Clin Nutr (19.8%) and the Am J Clin Nutr (16.5%)—, and a large number of articles in the latter journal are on circulatory diseases (15.33%) and cancer (10.7%). As well as papers on obesity, the Eur J Clin Nutr also publishes articles on endocrines and nutritional and metabolic illnesses (11.1%), as do the J Nutr (11.5%) and the Publ Health Nutr (9.3%).

Table III shows that the J Nutr (78.69%) and the Eur J Nutr (90%) journals publish the most material on food consumption in general. The number of articles on food consumption as a sole determining nutritional factor is notable in the Am J Clin Nutr (60.19%). On the other hand, although 48% of the articles published in Public Health Nutr are on food consumption in general, this journal also contains the most articles on body composition in general (42.6%), followed by the clinical journals -Am J Clin Nutr (34.9%) and Eur J Clin Nutr (34.5%). Finally, the few articles that have been

**Table III**  
Nutritional determinants in the original papers published in five scientific nutrition journals (January-June 2007)

	<i>Am J Clin Nutr</i>		<i>Eur J Clin Nutr</i>		<i>J Nutr</i>		<i>Eur J Nutr</i>		<i>Public Health Nutr</i>		<i>Total</i>	
	<i>Frequency (%)</i>	<i>(%)</i>	<i>Frequency (%)</i>	<i>(%)</i>	<i>Frequency (%)</i>	<i>(%)</i>	<i>Frequency (%)</i>	<i>(%)</i>	<i>Frequency (%)</i>	<i>(%)</i>	<i>Frequency (%)</i>	<i>(%)</i>
Food consumption	62 (38.99)	(60.19)	45 (28.30)	(55.56)	31 (19.50)	(50.82)	8 (5.03)	(80.00)	13 (8.18)	(17.33)	159 (100)	(48.18)
Social Factors	0		4 (33.33)	(4.94)	1 (8.33)	(1.64)	0		7 (58.33)	(9.33)	12 (100)	(3.64)
Body composition	10 (40.00)	(9.71)	12 (48.00)	(14.81)	2 (8.00)	(3.28)	0		1 (4.00)	(1.33)	25 (100)	(7.58)
Body composition, Behavior and Social Factors	26 (30.95)	(25.24)	16 (19.05)	(19.75)	10 (11.90)	(16.39)	1 (1.19)	(10.00)	31 (36.90)	(41.33)	84 (100)	(25.45)
Food consumption, Behavior and Social Factors	5 (10.00)	(4.85)	4 (8.00)	(4.94)	17 (34.00)	(27.87)	1 (2.00)	(10.00)	23 (46.00)	(30.67)	50 (100)	(15.15)
Total	103 (31.21)	(100)	81 (24.55)	(100)	61 (18.48)	(100)	10 (3.03)	(100)	75 (22.73)	(100)	330 (100)	(100)

**Table IV**  
Epidemiological study designs in the original papers published in five scientific nutrition journals (January-June 2007)

	<i>Am J Clin Nutr</i>		<i>Eur J Clin Nutr</i>		<i>J Nutr</i>		<i>Eur J Nutr</i>		<i>Public Health Nutr</i>		<i>Total</i>	
	Frequency (%)	(%)	Frequency (%)	(%)	Frequency (%)	(%)	Frequency (%)	(%)	Frequency (%)	(%)	Frequency (%)	(%)
Case Series	1 (12.5)	(0.97)	3 (37.5)	(3.7)	2 (25)	(3.28)	2 (25)	(20)	0		8 (100)	(2.42)
Epidemiological Descriptive	3 (16.67)	(2.91)	5 (27.78)	(6.17)	4 (22.22)	(6.56)	0		6 (33.33)	(8)	18 (100)	(5.45)
Cross-Sectional	20 (16)	(19.42)	39 (31.2)	(48.15)	22 (17.6)	(36.07)	1 (0.8)	(10)	43 (34.4)	(57.33)	125 (100)	(37.88)
Case control	5 (41.67)	(4.85)	2 (16.67)	(2.47)	2 (16.67)	(3.28)	0		3 (25)	(4)	12 (100)	(3.64)
Follow up	27 (48.21)	(26.21)	13 (23.21)	(16.05)	8 (14.29)	(13.11)	3 (5.36)	(30)	5 (8.93)	(6.67)	56 (100)	(16.97)
Non randomized clinical trials	6 (28.57)	(5.83)	5 (23.81)	(6.17)	2 (9.52)	(3.28)	1 (4.76)	(10)	7 (33.33)	(9.33)	21 (100)	(6.36)
Randomized clinical trials	41 (50)	(39.81)	13 (15.85)	(16.05)	20 (24.39)	(32.79)	3 (3.66)	(30)	5 (6.1)	(6.67)	82 (100)	(24.85)
Qualitative research	0		1 (25)	(1.23)	0		0		3 (75)	(4)	4 (100)	(1.21)
Ecological design	0		0		1 (50)	(1.64)	0		1 (50)	(1.33)	2 (100)	(0.61)
Non classifiable	0		0		0		0		2 (100)	(2.67)	2 (100)	(0.61)
Total	103 (31.21)	(100)	81 (24.55)	(100)	61 (18.48)	(100)	10 (3.03)	(100)	75 (22.73)	(100)	330 (100)	(100)

published exclusively on social factors as nutritional determinants have mostly appeared in *Publ Health Nutr* (58.3%).

Table IV shows the frequency of use of the different epidemiological study designs in the five nutrition journals under analysis. The lack of descriptive studies can be considered to be a positive discovery. Observational designs (68.2%) are more frequent than experimental designs (31.8%), with cross-sectional studies being the most common (37.9%), followed by clinical trials (24.9% randomized and 6.4% non-random) and cohort studies (17%). Clinical trials are the most frequent type of design published in the *Am J Clin Nutr* (39.8% randomized and 5.8% non-random), the journal that publishes most trials in general (50% randomized and 28.5% non-random of the total trials published during this period). Most research published in the *Eur J Clin Nutr* is of a cross-sectional design (48.2%), which represents 31.2% of the 125 cross-sectional studies published during the six month period in question. However, it is the *Public Health Nutr* that published the highest number of cross-sectional studies (34.4%), which is 57.3% of all the articles published in this journal.

Table V refers to the country of origin of the signing authors in the articles published in each of the nutrition journals studied. Over half of the articles (51.3%) are written by just 10 countries. The country with the highest production rate is the US, particularly in the two American journals, the *Am J Clin Nutr* and the *J Nutr*, in this order. Meanwhile, countries from developing regions publish the least articles.

22.7% of the research published is carried out by international networks from the different continents, with Europe producing most articles of this type. 26%

of papers are drawn up as part of intercontinental network projects, with a relatively high collaboration rate between North America and Asia (6.1%), and North America and Europe (5.8%).

## Discussion

The scientific papers analyzed reflect the high-quality of the research activity carried out in the field of nutrition during the period studied. Most of the study designs had inferential power, which implies a high impact on the knowledge and practices of the readers and is also crucial in order for food policies to be improved. The studied population was represented equally by healthy and sick subjects, coinciding with the aims of international scientific policies on this issue. However, the topics covered reflect a biased view of nutrition as they tend to deal with problems affecting developed countries, such as chronic diseases, rather than those suffered by developing countries, such as food insecurity. The underlying and basic risk factors related to social determinants of health must also be considered in scientific papers on nutrition, along with behavioral and biological risk factors. Journals have become more international to a certain degree as regards the origin of their articles. However, those who publish most tend to be authors from the same country of origin as the journal. This situation could be improved, particularly by encouraging scientific production from developing countries, where the most prevalent food problems are to be found worldwide.

As regards the limitations of our results, they merely paint a partial picture of worldwide efforts being made in nutrition research. Not all nutrition journals have

**Table V**  
*Geographic origin of the authors of the original papers published in five scientific nutrition journals (January-June 2007)*

Country/Continents	Am J Clin Nutr %	Eur J Clin Nutr %	J Nutr %	Eur J Nutr %	Public Health Nutr %	Total %
<b>T1 Country<sup>1</sup></b>						
USA	35.9	3.7	26.2		16.0	20.6
UK	2.9	4.9	3.3		16.0	6.4
Germany	1.9	4.9	1.6	60	1.3	4.2
Australia	3.9	7.4			4.0	3.9
Canada	5.8	1.2	4.9		1.3	3.3
Denmark	1.9	4.9	3.3		2.7	3.0
France	3.9	6.2				2.7
Holland	2.9	4.9	1.6		1.3	2.7
Spain	1.0	4.9	1.6		2.7	2.4
Japan		6.2	1.6	10		2.1
<b>1 Continent</b>						
Europe	10.7	18.5	9.8		14.7	13.0
Asia	2.9	7.4		10	9.3	5.2
North America	2.9		3.3		2.7	2.1
Oceania	1.0		1.6		2.7	1.2
Africa					2.7	0.6
Latin America		2.5				0.6
<b>2 Continents</b>						
Asia + North America	6.8	3.7	11.5		4.0	6.1
Europe + North America	10.7	4.9	1.6		4.0	5.8
Asia + Europe		4.9	6.6		2.7	3.0
Latin America + North America	1.0	1.2	6.6	10	1.3	2.4
Africa + Europe	1.0	2.5	1.6		1.3	1.5
Asia + Oceania		2.5			2.7	1.2
Africa + North America	1.0		3.3			0.9
Europe + Latin America		1.2			1.3	0.6
Europe + Oceania		1.2			1.3	0.6
Africa + Oceania				10		0.3
<b>3 and more Continents</b>						
Total	103	81	61	10	75	330

<sup>1</sup>First 10 countries with greater number of published articles

been analyzed which means that the true frequencies of the variables studied may be underestimated. Furthermore, a great deal of information produced in this field is published in journals with no specific relationship to nutrition. However, the 5 selected journals are a good sample of all the North American and European specialist journals. As mentioned in the methodology section, there are only 9 journals with an impact factor greater than 2 that publish original articles.

The substantial difference in the number of articles published in the various journals makes comparisons difficult. The Am J Clin Nutr published the most articles, with a contribution of 78.6% to the total number of trials studied (47 trials), whilst the Eur J Nutr contributes few trials, just 8.4% (4 trials). This is due to the fact that the latter only published 10 articles in the whole six-month period studied, whilst the Am J Clin Nutr published 103 articles in the same period. However, this dispersion in the number of articles published in each journal does not affect the identification of the importance of each type of study and its comparison

with the other journals. For example, the most predominantly published studies in the Am J Clin Nutr are clinical trials (45.6%) and, secondly, follow-up studies (26.2%). These proportions are similar in the Eur J Nutr at 40% and 30%, respectively. The same is also true for the remaining variables analyzed: study populations, determinants studied and country of origin of the articles.

The articles published in the journals analyzed in this study coincide only partially with the priority intervention areas proposed within the framework of international nutrition meetings such as the International Conference on Nutrition, 1992,<sup>17</sup> and the World Food Summit 1996.<sup>18</sup> Their action plans referred to food-related non-transmissible chronic illnesses as a priority, and a large number of articles related to such diseases have indeed been detected in the journals analyzed. However, these action plans also refer to desnutrition, micronutrient-deficiency diseases and breastfeeding, none of which are mentioned to any great extent in any of the articles.



The papers analyzed also help to generate useful knowledge for the prevention of avoidable chronic diseases thanks to the number of articles produced on determinants derived from risk behaviours. This result coincides with the second international aim of institutional scientific policies, which is based on the need to carry out research in order to reduce the risks that cause avoidable illnesses.<sup>3,4</sup> Obesity is the health problem and risk factor for other illnesses about which the journals analyzed publish most material, particularly and logically in clinical journals, both in the US and in Europe. This is also the case for circulatory diseases and cancer. Another fact that could have contributed to the increase in papers on chronic health problems is the major development and use of epidemiological studies in health science research.<sup>19</sup>

Our results show that research on healthy and sick populations is equal in quantity, which coincides with the first international aim of the institutional scientific policies based on promoting a healthy lifestyle in order to combat avoidable risks. Perhaps for this reason, many articles and, consequently, much knowledge have been generated on food consumption in both healthy and sick populations.

Except in the Public Health Nutr, very few of the articles deal exclusively with social context factors (political, cultural and economic). This is remarkable given that such aspects are related to the underlying and basic causes<sup>20</sup> that are possibly the reasons for the origins of most of the world's nutritional and food problems. The underlying causes in food security include food supply, distribution and consumption factors, which vary greatly from country to country and determine the diversity and differences in dietary patterns associated with nutritional and food problems. Meanwhile, the basic causes are linked to the economic, social and political structure of each country and of the different regions, which in turn affects the underlying causes,<sup>20</sup> i.e. food security and diet.<sup>7</sup> Consequently, as the results of our analysis reflect, the most studied factors are the immediate or behavioral determinants. However, the importance given to research on the immediate causes of nutrition and dietary problems is currently being questioned in scientific literature,<sup>21</sup> as it tends to suggest that individuals are solely responsible and to blame for their nutritional problems, whilst other contextual factors might also restrict individuals' choice options.<sup>20</sup> For example, corporations not only influence the policymaking process, but also the way in which the public perceives nutritional problems, encouraging consumers to see the obesity epidemic as the result of their own decisions, rather than social beliefs and environmental conditions promoted by the industry.<sup>22</sup> Therefore, it is of utmost importance to reflect upon and identify the interrelation processes that exist between the immediate determinants and the underlying and basic causes, including the explanatory levels.

The papers analyzed reflect the high quality of the research carried out on nutrition, due to the inferential

power of many of the study designs. It is also interesting to note the high number of clinical trials and cohort studies published in the *Am J Clin Nutr* capable of establishing causal relationships. Furthermore, the fact that most of the studies published in the *Publ Health Nutr* journal are cross-sectional may be due to its marked interest in studying social determinants and its ability to establish comparisons between different countries.

The greater production of new knowledge on chronic diseases compared with micronutrient-deficiency diseases may be related to the country of origin of the leading scientific producers on nutrition, as occurs in other health-related fields;<sup>23,24</sup> i.e. the US and Western Europe, whilst only a few authors come from developing countries.

Evidence-based intervention policies on nutrition positively affect the complex interrelations between classic pathologies—both infectious and deficiency—and prevalent chronic illnesses, which are now common to developing countries and most of the world population. However, this type of policy is currently reliant on the quality of knowledge presented in journals which, although of international interest, responds only to extremely specific local characteristics. Creating a balance between the papers published in developed and developing countries as regards quality knowledge remains a challenge for the scientific community as a whole, for instance by increasing the number of scientific networks between these two types of countries.

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