# Are Obese Patients Assisted in Losing Weight?

Armina Sepehri, MPH; Vicente F. Gil-Guillén, MD, PhD; Antonio Palazón-Bru, MPH; Domingo Orozco-Beltrán, MD, PhD; Concepción Carratalá-Munuera, PhD; Ernesto Cortés Castell, PhD; and Mercedes Rizo-Baeza, PhD

**Objectives:** To quantify obesity inertia (OI) in primary healthcare in the Valencian Community (Spain) and determine the related factors.

**Study Design:** Cross-sectional analysis.

**Methods:** In 2003, the whole population 40 years and older was invited to undergo a check-up. We included all obese persons (body mass index [BMI] ≥30 kg/m$^2$) of the first 6 months after the invitation (n = 8687). OI was defined as the lack of advice by the healthcare professionals to lose weight. Other data recorded: gender, history of cardiovascular risk factors (CVRFs) or cardiovascular disease (CVD), groups of BMI (Class I obesity [BMI <35 kg/m$^2$] and the rest), age, blood pressure, and lipids. The patients without CVD and who were younger than 75 years (n = 7700) were classified according to the REGICOR cardiovascular risk as either high or low. The OI was quantified and related factors assessed, calculating the adjusted odds ratios (ORs) from multivariate models.

**Results:** In the overall sample, OI was 16.6% (95% confidence interval [CI], 15.8-17.4). Associated factors: male (OR = 1.19; 95% CI, 1.06-1.35); no history of hypertension (OR = 0.85; 95% CI, 0.74-0.97), or dyslipidaemia (OR = 0.86; 95% CI, 0.73-1.01), or diabetes (OR = 0.80; 95% CI, 0.64-1.00), or CVD (OR = 0.79; 95% CI, 0.62-1.01); and Class I obesity (OR = 0.83; 95% CI, 0.72-0.96). In the REGICOR sample, the OI was 16.9% (95% CI, 16.0-17.7). Associated factors: high REGICOR (OR = 2.27; 95% CI, 1.30-3.98) and Class I obesity (OR = 0.82; 95% CI, 0.71-0.95).

**Conclusions:** OI exists in 1 of every 6 patients. OI occurs less frequently in patients with a history of CVRF, and more frequently in Class I obesity and in those with a high cardiovascular risk.

*Am J Manag Care. 2014;20(4):e122-e128*

**For author information and disclosures, see end of text.**

Obesity is a very common disorder worldwide.[1] In addition, obesity is associated with such healthcare problems as diabetes mellitus, hypertension, dyslipidaemia, and cardiovascular diseases (CVD).[2] Clinical practice guidelines recommend that healthcare professionals intervene to reduce the prevalence of this problem. These professionals should help those patients who need to lose weight, by means of personalized counselling about a healthy lifestyle (food and physical exercise).[3-6]

The Valencian Community is situated in the Mediterranean area of eastern Spain, and has a population of 4,518,126 inhabitants (figures from January 2004).[7] Primary healthcare is given at health centers, and is universal and free for patients. The patients who attend these health centers are mainly women of older age with cardiovascular risk factors (CVRF), and they are frequent visitors.[8] In this community, the Valencia study analyzed the impact of obesity in the population. From 1991 to 2005, the prevalence of obesity rose from 7.3% to 12.4%, and was the most important problem for men aged 34 years and older and women aged 50 years and older. Also of note was that these patients had other CVRFs.[9] In Spain, the health costs associated with obesity account for 7% of total healthcare costs. Over 35% of those costs correspond to obesity-related diseases such as CVD, diabetes mellitus, and dyslipidemia. The remaining 65% of costs are due to different types of cancer, kidney and liver disorders, sleep apnea, and even urinary incontinence—all related to obesity.[10] Notable is the yield of bariatric surgery for both health and cost-benefit reasons, both in Spain and in other countries.[11,12]

A program of preventive activities was started in this Community at the end of 2003, aimed at the whole population over age 40 years. Each person was invited by mail to participate, and then contacted by phone to arrange an appointment at their health center. There, they underwent a preventive examination by medical and nursing personnel, and were given a report with the result of the examination together with the opportune recommendations; a copy of this report was also left at the health center. This program followed the recommendations of the Programme for Prevention and Health Promotion (PPHP) of the Spanish Society of Family and Community Med-



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icine.[3,13-15] Briefly, this program contains cardiovascular screening (hypertension, diabetes mellitus, dyslipidemia, smoking, obesity, etc), gynecological screening (cytology, mammography, etc), and a vaccination campaign (flu, tetanus, and pneumococcus).

Phillips et al in 2001 defined clinical inertia as failure by the physician to start or intensify treatment when this was indicated.[16] A few years later, Andrade et al defined the concept of therapeutic inertia.[17] Reflection about the definition of these concepts suggests that inertia not only influences the therapeutic process, but may also affect other parts of the clinical care process, such as personalized counseling about healthy lifestyle habits for those patients who need it.

As part of the preventive activities program, this study analyzed inertia associated with advising obese patients about a healthy lifestyle in order to lose weight, together with the possible associated factors. Others have also analyzed this behavior,[18-26] assessing the advice and its association with a history of cardiovascular risk factors. We therefore wondered whether the healthcare professionals were paying more attention to already diagnosed cardiovascular risk factors rather than considering the current status of the patients. Accordingly, we calculated the cardiovascular risk of these patients using the REGICOR score,[27] which is a calibration of one of the scales from the Framingham study designed for the Spanish population,[28] and determined the association of this risk with the behavior of the healthcare professionals when aiding an obese patient to lose weight. The need for measures to improve the counselling of obese patients about weight loss can be seen from the results.

### Take-Away Points

- The cornerstone of treatment for obese patients is receiving advice about weight loss from a healthcare professional.
- We evaluate the behaviour of these professionals when advising obese patients about diet and exercise.
- Others have also analyzed this behaviour, assessing the lack of advice and its association with a history of cardiovascular risk factors.
- We therefore calculated the cardiovascular risk and determined the association of this risk with the studied behavior.
- A higher cardiovascular risk was associated with less advice received.
- These results are important for improving the behavior of health professionals when treating an obese patient.

## METHODS

### Design and Study Subjects

This cross-sectional study involved a sample of obese persons over age 40 years who participated in the preventive activities program of the Valencian Community during its first 6 months, and who wished to collaborate. Patients were considered to be obese if their body mass index (BMI) was at least 30 kg/m$^2$. Any patient who was not obese, according to this definition, was excluded from this study.

### Variables and Measurements

All the cardiovascular information recorded at the health examinations was studied. The main outcome measure was obesity inertia (OI). A patient was considered to have experienced OI if that patient's healthcare professional failed to provide personalized advice about both diet and exercise together as a means to lose weight. The healthcare professional also recorded the following variables: gender; personal history of hypertension, dyslipidaemia, diabetes mellitus, smoking, acute myocardial infarction, and stroke; BMI (in kg/m$^2$); age (in years); blood pressure (BP) (systolic [SBP] and diastolic [DBP] in mm Hg); total cholesterol and high-density lipoprotein (HDL) cholesterol (in mmol/L).

In order to calculate BMI, the weight and height were measured with a calibrated scale and stadiometer, removing all objects that could affect the weight, including shoes. BP was measured following current recommendations with well-calibrated semiautomatic aneroid devices (mercury) in adequate conditions. The lipid profile was measured first thing in the morning after a minimum 8-hour fast with calibrated equipment. The personal history of disease, gender, and age was obtained during the patient interview and corroborated from the clinical records.

After gathering all the data, the following groups of variables were made: (1) BMI groups according to the World Health Organization (WHO) classification: Class I obesity (BMI ≥30 kg/m$^2$ and <35 kg/m$^2$) and Class II and III obesity (BMI ≥35 kg/m$^2$)[29]; and (2) personal history of CVD, or having had an acute myocardial infarction or stroke.

After collecting and grouping the variables, the REGICOR cardiovascular risk was defined (Registre Gironí del Cor) in those patients for whom it was applicable. These patients were then classified in risk groups[27]: high (≥20%) and low (<20%). This scale is an adaptation of the Wilson scale for the Spanish population and it estimates the risk of having a coronary event in the next 10 years in patients aged 30 to 74 years who have not had any prior CVD.[28]

**Table 1.** Analysis of Inertia for Obesity at Primary Healthcare Centers in the Valencian Community (Spain): 2003-2004 Data

| Variable | Total 8687 n(%)/x ± s | Inertia 1440 (16.6%) n(%)/x ± s | Adjusted OR | 95% CI (Adjusted OR) |
|---|---|---|---|---|
| **Gender** | | | | |
| Male | 3534 (40.7) | 643 (18.2) | 1.19[d] | (1.06-1.35) |
| Female[a] | 5153 (59.3) | 797 (15.5) | | |
| **Personal history of hypertension** | | | | |
| Yes | 3021 (34.8) | 439(14.6) | 0.85[c] | (0.74-0.97) |
| No[a] | 5666 (65.2 | 1001 (17.7) | | |
| **Personal history of dyslipidemia** | | | | |
| Yes | 1526 (17.6) | 213 (14.0) | 0.86[b] | (0.73-1.01) |
| No[a] | 7161 (82.4) | 1227 (17.2) | | |
| **Personal history of diabetes** | | | | |
| Yes | 804 (9.3) | 102 (12.7) | 0.80[b] | (0.64-1.00) |
| No[a] | 7883 (90.7) | 1338 (17.0) | | |
| **Personal history of smoking** | | | | |
| Yes | 1506 (17.3) | 260 (17.3) | 0.98 | (0.84-1.15) |
| No[a] | 7181 (82.7) | 1180 (16.5) | | |
| **Personal history of CVD** | | | | |
| Yes | 641 (7.4) | 83 (13.0) | 0.79[b] | (0.62-1.01) |
| No[a] | 8046 (92.6) | 1357 (16.9) | | |
| **BMI groups** | | | | |
| ≥35 kg/m$^2$ | 2038 (23.5) | 290 (14.2) | 0.83[c] | (0.72-0.96) |
| <35 kg/m$^2$,[a] | 6649 (76.5) | 1150 (17.3) | | |
| **Age (years)** | 57.1 ± 10.2 | 56.9 ± 10.3 | 1.00 | (1.00-1.01) |

Goodness-of-fit of the model: $\chi^2 = 45.3$, $P < .001$.
BMI indicates body mass index; CI, confidence interval; CVD, cardiovascular disease; OR, odds ratio.
ORs were adjusted for: gender; personal history of hypertension, dyslipidemia, diabetes, smoking and CVD; and BMI and age groups.
[a]Reference; [b]$0.05 < P < 0.1$; [c]$0.01 < P < .05$; [d]$0.001 < P < .01$.

The predictive variables on this scale are gender, age, total cholesterol, HDL cholesterol, BP (SBP and DBP), diabetes mellitus, and smoking.

There were no missing data, as the healthcare professionals took particular care to complete the whole preventive activities program in all the participants.

## Sample Size

The overall sample size was 8687 patients with obesity. Of these, 7700 fulfilled the criteria necessary to be evaluated with the REGICOR (primary cardiovascular prevention and age <75 years). Thus, using a significance level of 5% and a maximum expected proportion ($P = q = .50$), the expected error in the estimation of OI was 1.05% in the overall sample and 1.12% in the patients whose REGICOR was calculated.

## Statistical Analysis

Absolute and relative frequencies were used to describe the qualitative variables, whereas means and standard deviations were used for the quantitative variables. Multivariate logistic regression models were calculated to estimate the adjusted odds ratios (ORs) in order to analyze the relation between OI and the study variables. For the overall sample, the ORs were adjusted for gender; personal history of hypertension, dyslipidemia, diabetes mellitus, smoking, and CVD; BMI; and age groups. For the REGICOR sample, the ORs were adjusted in 2 ways: (1) REGICOR risk group and BMI as a quantitative variable; and (2) REGICOR risk group and BMI group. The likelihood of OI in the multivariate models was used to create figures to help interpret the results. The likelihood ratio test was carried out for the goodness-of-fit of the models.

**Table 2.** Analysis of Inertia for Obesity in Primary Cardiovascular Prevention Patients at Primary Healthcare Centres in the Valencian Community (Spain): 2003-2004 Data

| Variable | Total 7700 n(%)/x ± s | Inertia 1300 (16.9%) n(%)/x ± s | Adjusted OR | 95% CI (Adjusted OR) |
|---|---|---|---|---|
| **REGICOR (probability of event)** | 6.1 ± 3.6 | 6.2 ± 3.8 | — | — |
| **REGICOR risk groups** | | | | |
| ≥20% | 57 (0.7) | 18 (31.6) | 2.27[a,f] | (1.30-3.99)[a] |
| <20%[c] | 7643 (99.3) | 1282 (16.8) | 2.27[b,f] | (1.30-3.98)[b] |
| **Gender** | | | | |
| Male | 3084 (40.1) | 572 (18.5) | — | — |
| Female | 4616 (59.9) | 728 (15.8) | — | — |
| **Personal history of diabetes** | | | | |
| Yes | 608 (7.9) | 83 (13.7) | — | — |
| No | 7092 (92.1) | 1217 (17.2) | — | — |
| **Systolic blood pressure (mm Hg)** | 134.2 ± 17.1 | 134.2 ± 17.2 | — | — |
| **Diastolic blood pressure (mm Hg)** | 81.5 ± 10.2 | 81.6 ± 10.6 | — | — |
| **Total cholesterol (mmol/l)** | 5.5 ± 1.0 | 5.5 ± .0 | — | — |
| **HDL-C (mmol/l)** | 1.6 ± 2.7 | 1.5 ± 1.2 | — | — |
| **Age (years)** | 56.0 ± 9.1 | 56.0 ± 9.2 | — | — |
| **Personal history of smoking** | | | | |
| Yes | 1408 (18.3) | 246 (17.5) | — | — |
| No | 6292 (81.7) | 1054 (16.8) | — | — |
| **BMI groups** | | | | |
| ≥35 kg/m$^2$ | 1806 (23.5) | 267 (14.8) | 0.82[b,f] | (0.71-0.95)[b] |
| <35 kg/m$^2$[c] | 5894 (76.5) | 1033 (17.5) | — | — |
| **BMI (kg/m$^2$)** | 33.4 ± 3.3 | 33.2 ± 3.3 | 0.98[a,e] | (0.96-1.00)[a] |

Goodness-of-fit of the models: model with BMI as quantitative variable, $\chi^2 = 12.9$ $P = .002$; model with BMI as qualitative variable, $\chi^2 = 14.8$, $P < .001$.
BMI indicates body mass index; CI, confidence interval; HDL-C, high-density lipoprotein cholesterol; OR, odds ratio; REGICOR, Registre Gironí del Cor.
ORs were adjusted in 2 ways: (1) quantitative model: REGICOR and BMI groups as a quantitative variable; and (2) qualitative model: REGICOR risk group and BMI group.
[a]Model with BMI as quantitative variable:$\chi^2 = 12.9$ $P = .002$; [b]Model with BMI as qualitative variable: $\chi^2 = 14.8$ $P < .001$; [c]Reference; [d]$0.05 < P < .1$; [e]$0.01 < P < .05$; [f]$0.001 < P < .01$.

All analyses were performed at a 5% significance level and associated confidence intervals (CIs) were estimated for each relevant parameter. All of the analyses were performed using SPSS 19 (IBM, Armonk, New York).

The first statistical analysis done (overall sample) was similar to that done by others,[18-26] mainly prioritizing the personal history of CVRF. The second analysis (REGICOR sample) was an innovative examination of the association between inertia and cardiovascular risk. Thus, we assessed the BMI both qualitatively and quantitatively. Though this increases the complexity of the paper, both forms provide clinically relevant information.

### Ethical Consideration

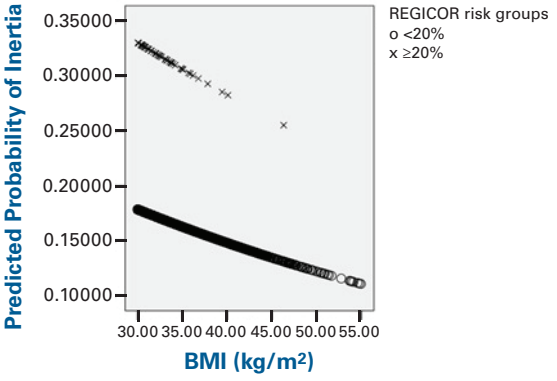
This study was approved by an institutional review board of the Valencian Community, permitting data analysis and complying with current legislation on medical ethics. This institution had no role in data collection, analysis, or interpretation; nor did it have the right to approve or disapprove publication of the finished manuscript. Furthermore, the data were anonymized and encrypted, satisfying the data protection law.

## RESULTS

### Overall Sample

Table 1 summarizes the information concerning the overall sample (n = 8687). Most of those who participated in the study were women; there was a high prevalence of CVRF (over 7% had CVD); and the immense majority of patients had a BMI associated with Class I obesity.[29]

**Figure.** Predicted Probability of Inertia for Obesity for Primary Cardiovascular Prevention Patients at Primary Healthcare Centers in the Valencian Community (Spain): 2003-2004 Data




BMI indicates body mass index; REGICOR, Registre Gironí del Cor.

The magnitude of OI was 16.6% (95% CI, 15.8-17.4). Factors associated with OI were being male (OR = 1.19; 95% CI, 1.06-1.35); no personal history of hypertension (OR = 0.85; 95% CI, 0.74-0.97), or dyslipidemia (OR = 0.86; 95% CI, 0.73-1.01), or diabetes mellitus (OR = 0.80; 95% CI, 0.64-1.00), or CVD (OR = 0.79; 95% CI, 0.62-1.01); and having a BMI representing Class I obesity (OR = 0.83; 95% CI, 0.72-0.96).

### REGICOR Sample

Table 2 shows the results in the REGICOR sample (n = 7700). A small proportion of persons had a high risk according to the REGICOR (0.7%). Their characteristics were very similar to those of the overall sample (gender, age, personal history of diseases, and smoking), with a mean blood pressure representing prehypertension (134/81 mm Hg),[30] and mean total and HDL cholesterol levels much higher than normal (5.5 mmol/L and 1.6 mmol/L, respectively).[31] The proportion of OI was 16.9% (95% CI, 16.0-17.7). The associated factors, after adjusting for BMI as a quantitative variable, were a high REGICOR (OR = 2.27' 95% CI, 1.30-3.99) and a low BMI (OR = 0.98; 95% CI, 0.96-1.00), whereas in the model adjusted for BMI group the associated factors were a high REGICOR (OR = 2.27; 95% CI, 1.30-3.98) and a borderline BMI representing Class I obesity (OR = 0.82; 95% CI, 0.71-0.95). In the model with the BMI as a quantitative variable a Cartesian chart (the Figure) was designed showing the following elements: BMI on the X axis, likelihood of OI on the Y axis, and REGICOR risk groups by symbols (crosses and circles). This chart shows that persons with a high risk have a greater likelihood of experiencing OI, and the greater the BMI the lower the likelihood of experiencing OI.

## DISCUSSION

The first analysis of the results of this study, considering the whole sample with obesity, shows that OI occurs in about 1 in 6 patients. A search of the literature showed studies evaluating advice about losing weight in obese patients. However, these studies differ concerning both the type of population and the mode of evaluation (eg, some only evaluate physical exercise or diet whereas others evaluate both). The rate of OI found in these studies ranged from 35 to 63%.[18-27] In our study, though, the rate of OI was much lower, possibly because our study took place during a preventive campaign.

Factors associated with OI were a borderline BMI (<35 kg/m$^2$), being male, and no history of chronic disease (hypertension, diabetes mellitus, or dyslipidemia) or CVD. Other authors have reported similar findings, as well as detecting greater inertia among certain racial groups and in association with psychosocial factors, extreme ages, arthritis, and frequent visitors.[18-27]

Healthcare professionals, when assessing an obese patient, may pay closer attention to those who have previously been diagnosed with a chronic disorder (hypertension, diabetes mellitus, or dyslipidemia) or CVD. Accordingly, we undertook a second analysis to study the behavior of these healthcare professionals concerning weight loss counseling during medical revisions—that is, evaluating the current CVRF status rather than a history of these factors. We therefore calculated the REGICOR cardiovascular risk score using data from the medical revision (gender, age, lipid profile, blood pressure, diabetes mellitus, and smoking) instead of from the personal history of CVRF. This analysis showed that the magnitude of OI was very similar to that found earlier. Factors associated with OI were high cardiovascular risk and lower BMI. This result is very worrying, as these patients have a very high likelihood of experiencing a CVD in the next 10 years if no preventive measures are taken. Controlling BP, lipid profile, and diabetes mellitus, as well as quitting smoking are the main preventive measures.

When we started the study we expected to find a lower magnitude of OI, and that those patients who did not receive advice about weight loss would have a lower cardiovascular risk. However, the results were very surprising. First, in a cardiovascular preventive activity

program, where all obese patients should receive recommendations about how to lose weight, only 1 out of every 6 obese patients did not receive this advice. Many of these patients are diagnosed with other CVRF, for which treatment implies hygiene and adoption of certain dietary measures to lose weight. Nonetheless, the Spanish healthcare system needs nutritionists and it would be desirable for healthcare professionals to have a better understanding of how diet and physical activity can help patients lose weight adequately. This situation may have a negative influence on the lack of counseling given to high cardiovascular risk patients.

An additional point we consider important, and that may explain the conservative attitude of healthcare professionals concerning patients with Class I obesity and at greater cardiovascular risk, is the lack of evaluation of obesity in the risk tables used in clinical practice (SCORE and REGICOR).[27,32] The ESCARVAL study (EStudio CARdiometabólico VALenciano), currently in progress in the Valencian Community, will incorporate both the BMI and the waist circumference into the evaluation of the cardiovascular risk.[33,34] Nonetheless, a logical and expected result was to find greater inertia in Class I obesity and lower inertia in Class II or III obesity.

Healthcare policies should be active in the fight against obesity via the implementation of hygiene and dietary measures. However, the Valencian Community is experiencing a real epidemic of obesity that is resulting in an increased prevalence of cardiovascular risk factors.[9] Our results highlight the need to integrate these healthcare policies in health centers, with the early identification of the obese patient and intervening via personal advice about ways to lose weight.

### Study Limitations and Strengths

The main strength of this study is its large sample size. This minimizes the random error when drawing conclusions based on a population attending a preventive activities program at their health center. In addition, the fact that all the health centers in the Valencian Community participated in this study, as well as that we quantified the problem of inertia in the decisions of all the members of the primary care teams, provides our conclusions with external validity. This means that our results can be generalized to populations with a health system similar to ours (ie, universal, public, free/without charge to patients). It would therefore be interesting to compare and generalize the results, and to conduct similar studies in other countries with different health policies through projects involving large number of patients and health professionals.

The limitations are obviously those related with a cross-sectional study measuring the magnitude of a problem, as it cannot determine either the duration of the problem or its cause. This explains the need for analytical studies to obtain predictive scales for inertia to help in clinical practice as well as for clinical trials to study the best intervention. The most important bias in this study may be that which is accepted in this type of study (ie, selection bias). This bias is related to the fact that it is the most motivated patients who request a preventive revision. Logically, this cannot be changed, as each person has a different degree of healthcare motivation. However, it does not affect the aims of this study because we are quantifying the phenomenon of inertia or a conservative or tolerant attitude by primary care teams when counselling obese patients about weight loss. Concerning measurement bias, the care teams were asked to measure the variables using reliable devices and to undertake a correct clinical interview. This bias, too, is accepted in this type of study.

## CONCLUSIONS

Numerous studies have shown that if obese patients reduce their weight correctly, there is better control of BP, lipids, and diabetes mellitus.[35] Thus, it is vital that the professionals caring for obese patients with a high cardiovascular risk provide personalized advice about techniques of weight loss based on diet and physical exercise. In this way, obese patients with a high cardiovascular risk will be able to reduce their likelihood of an event.

We believe this study is ideal to quantify the lack of counselling of obese patients about weight loss techniques (ie, OI). This OI occurs in about 1 in every 6 obese patients attending for a preventive activities program. Healthcare professionals commit less OI in patients with a history of CVRF but, more worryingly, greater OI in patients with a high likelihood of having a cardiovascular event. In both cases the OI was associated with Class I obesity.

The main learning point from this study is that we have to adopt a more proactive attitude toward obesity. This attitude should be centered on personal advice about hygiene and dietary measures and the systematic inclusion of the calculation of the cardiovascular risk. Healthcare professionals should incorporate into their daily clinical practice advice about weight loss for obese patients, and as early as possible (before it becomes Class II or III). In addition, the cardiovascular risk should be measured routinely, which is right now an unusual prac-

tice, as obesity is not included in some of the risk equations currently used.[27,32]

*Acknowledgments*

Thanks to the Conselleria de Sanitat (health institution of Valencian Community), and the healthcare professionals and people of the Valencian Community, and to Antonio Fernández, who computerized all data collected in the study. The authors also thank Ian Johnstone for help with the English-language version of the text.

***Author Affiliations:*** Department of Clinical Medicine, Miguel Hernández University, San Juan de Alicante, Spain (AS, VFG-G, AP-B, DO-B, CC-M); Department of Nursing, University of Alicante, San Vicente del Raspeig, Spain (MR-B); Department of Phsychologist, Pediatrics, and Organic Chemistry, Miguel Hernández University, San Juan de Alicante, Spain (EC).

***Source of Funding:*** This study received a grant from the Conselleria de Sanitat (health institution of the Valencian Community, Spain), which was used to computerize all data collected in the study.

***Author Disclosures:*** The authors report no relationship or financial interest with any entity that would pose a conflict of interest with the subject matter of this article.

***Authorship Information:*** Concept and design (AS, VFG-G, AP-B, ECC, MR-B); analysis and interpretation of data (AS, VFG-G, AP-B); drafting of the manuscript (AS); critical revision of the manuscript for important intellectual content (AS, VFG-G, AP-B, CC-M, ECC, MR-B); statistical analysis (AP-B); obtaining funding (VFG-G, DO-B, CC-M); administrative, technical, or logistic support (VFG-G, DO-B, CC-M); supervision (AS, VFG-G, AP-B, DO-B, ECC, MR-B).

***Address correspondence to:*** Antonio Palazón-Bru MPH, Departamento de Medicina Clínica, Universidad Miguel Hernández, Carretera de Valencia-Alicante S/N, 03550 San Juan de Alicante, Spain. Tel: +34 965919309. Fax: +34 965919450. E-mail: antonio.pb23@gmail.com.

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