**Psicothema**

# Changes in Employment Situation and Macroeconomic Indicators Linked to Mental Health Following the Recession in Spain: A Multi-level Approach

Jesús Henares-Montiel[1], Isabel Ruiz-Pérez[1], Guadalupe Pastor-Moreno[2], Antonio F. Hernández[3], and Miguel Rodríguez-Barranco[1]

[1] Escuela Andaluza de Salud Pública, [2] CIBERESP, and [3] Universidad de Granada

## Abstract

**Background:** Periods of financial crisis are associated with higher psychological stress in the population and greater use of mental health services. This paper analyses the individual and contextual factors associated with mental health in the Spanish population in 2006, 2012 and 2017. **Method:** This was a cross-sectional, descriptive study at three timepoints: before (2006), during (2012) and after the recession (2017). The study population comprised individuals aged 16+ years old, polled for the National Health Survey. Dependent variable: psychiatric morbidity (PM). Independent variables: 1) Individual socio-economic variables: (socio-demographic and psycho-social variables) and 2) contextual socio-economic variables (financial, public welfare services and labour market indicators). Multilevel logistic regression models with mixed effects were constructed to determine changes in PM in relation to the variables studied. **Results:** Among women, the risk of PM increased when per capita health spending decreased and the percentage of temporary workers increased. The risk for men and women was lower when the employment rate decreased and the unemployment rate increased. **Conclusions:** It is possible that not only unemployment but also insecure employment entails a risk to mental health and that much of the employment created no longer guarantees basic levels of security it had achieved in previous decades.

*Keywords:* Mental health; health inequalities; financial crisis; employment; socio-economic factors.

## Resumen

*Cambios en la Situación Laboral e Indicadores Macroeconómicos Relacionados con la Salud Mental Tras la Recesión en España: un Enfoque Multi-nivel.* **Antecedentes:** las crisis económicas se asocian con mayor estrés psicológico y mayor uso de los Servicios de Salud mental. Este estudio analiza los factores individuales y contextuales asociados con la salud mental en España durante 2006, 2012 y 2017. **Método:** estudio transversal de tres periodos: antes (2006), durante (2012) y después de la recesión (2017). Se incluyó a los individuos de 16+ años entrevistados en la Encuesta Nacional de Salud. Variable dependiente: morbilidad psíquica (MP). Variables independientes: 1) socio-económicas individuales: (socio-demográficas y psicosociales) y 2) socio-económicas contextuales (indicadores económicos, servicios públicos y mercado laboral). Se construyeron modelos de regresión logística multinivel con efectos mixtos para determinar los cambios en la MP en relación a las variables estudiadas. **Resultados:** el riesgo de MP en mujeres aumentó con la disminución del gasto en salud per cápita y el aumento del porcentaje de trabajadores temporales. El riesgo disminuyó en hombres y mujeres con la disminución de la tasa de empleo y el aumento de la tasa de desempleo. **Conclusiones:** es posible que no solo el desempleo sino también la inseguridad laboral conlleve riesgo para la salud mental y que gran parte del empleo actual no garantice los niveles de seguridad de décadas anteriores.

*Palabras clave:* salud mental; desigualdades en salud; crisis económica; empleo; factores socio-económicos.

One in every four Europeans will suffer some mental disorder at least once in the course of their lives, and the cost of mental health (MH) problems has been estimated at between 3 and 4 per cent of Gross National Product (World Health Organization, 2013). The study of MH is a health challenge in every country and a priority line of research (European Commission, 2021), despite the fact that funding for MH research in Europe is much less than

the impact these disorders have on the population (Haro et al., 2014).

To encourage its study, many countries propose that it should be included in epidemiological vigilance systems, highlighting the usefulness of national and/or European health surveys for monitoring psychiatric morbidity in the population, both for adults and for children and adolescents (Red Nacional de Vigilancia Epidemiológica, 2018).

The main European source of data on health in general and MH in particular is Eurostat, the statistical office of the European Union. The information on MH available in Eurostat comes mainly from various national and/or European surveys, which constitute a valuable source of information on the state of health of the population, as well as being an important underpinning of any

healthcare system (Odone et al., 2018; Red Nacional de Vigilancia Epidemiológica, 2018).

In Spain many studies have been conducted addressing MH through various surveys (national and European), considering a range of populations or circumstances, such as the working population (Arias-De La Torre et al., 2016), the role of the family and workload within and outside the home (Arias-de la Torre et al., 2018) or the immigrant population (Henares-Montiel et al., 2018).

In health surveys, the state of MH is identified using self-administered instruments such as the General Health Questionnaire (GHQ-12) (Rocha et al., 2011). The latter has been used in the Spanish National Health Survey (SNHS) in recent decades to ensure the necessary comparability when surveys from different years are used to analyse trends over time in the population (Cabrera-León et al., 2017), to establish comparisons between population groups or to observe the impact of a specific situation, such as the economic crisis (Bartoll et al., 2014).

Moreover, the surveys include other individual health and social-healthcare indicators which enable us to analyse MH-related factors in the study population with large sample sizes (Red Nacional de Vigilancia Epidemiológica, 2018). One of the advantages they offer is that they make it possible to analyse the profiles of men and women independently, which is indispensable for addressing gender differences in MH (Rohlfs et al., 2000).

The effects of the 2008 global financial crisis on MH have been studied using these surveys in a number of countries (Economou et al., 2019; Gili et al., 2016; Tamayo-Fonseca et al., 2018), highlighting the fact that the crisis is associated with higher psychological stress among the population and greater use of mental health services (Leinsalu et al., 2019; Medel-Herrero & Gómez-Beneyto, 2019). Various articles have addressed the impact of socio-economic crises on MH in Spain. Most of them have focused exclusively on analysing the effect of individual factors (Arias-De La Torre et al., 2016; Arias-de la Torre et al., 2018; Henares Montiel et al., 2020; Henares-Montiel et al., 2018).

However, the effects of an economic downturn do not have the same impact on all individuals and in all countries; sex, age, level of education, marital status, size of household, employment, income, belief systems and social relationships are individual factors which have a bearing on greater or lesser resilience (Henares-Montiel et al., 2018; Konstantakopoulos et al., 2019). But in addition to these individual variables, there are contextual variables which can either mitigate or intensify the adverse effects of the crisis. These include variables relating to the political and institutional context, such as economic indicators, public welfare services indicators and labour market indicators (Oliva et al., 2020; Othman et al., 2019; Ruiz-Pérez et al., 2017).

In order to analyse the case of Spain, one of the countries most affected by the 2008 crisis, two particular factors must be taken into account: on the one hand, the fact that the healthcare system offers practically universal cover, and on the other, that there are differences between regions due to the decentralisation of responsibility for healthcare, resulting in substantial differences in the austerity measures adopted during the crisis period (Bacigalupe et al., 2016). In a previous study, Ruiz-Pérez et al. analysed the socio-economic factors linked with MH during the crisis through two health surveys (Ruiz-Pérez et al., 2017) showing that lower health spending per capita and a higher percentage of temporary workers were associated with worse mental health for both males and females. However, no study has analyzed the impact of individual and contextual socio-economic determinants on mental health before, during and after the economic crisis.

The objectives of this study are: 1) to analyse the individual socio-economic factors related to MH in 2006, 2012 and 2017, and 2) to analyse the contextual socio-economic factors associated with mental health in the Spanish population during the three periods mentioned.

## Methods

### *Participants*

This study used cross-sectional data for 2006, 2012 and 2017 from the National Health Survey, a nationally representative survey of the population aged 16 years or over resident in Spain (Ministry of Health, Consumption and Social Welfare, 2021). The study sample included 29,487 subjects in 2006, 21,007 in 2012 and 23,089 in 2017.

### *Instruments*

### *Dependant Variable*

*Psychiatric morbidity:* measured by the twelve-item version of the General Health Questionnaire (GHQ-12), adapted and validated for Spain (Sánchez-López & Dresch, 2008). The items were summarised in an index ranging from 0 to 12 and dichotomised by three or more points to indicate psychiatric morbidity (PM).

### *Individual Socio-economic Independent Variables:*

*Socio-demographic variables:* age, marital status, employment situation, level of education (no formal education, low, medium, or high, as per ISCED, the International Standard Classification of Education; low level equates to primary education, medium level to secondary education and intermediate vocational training, and high level to advanced vocational training and higher education); socio-professional class (determined on the basis of current or most recent professional occupation according to National Occupation Classification CNO-2011 and classified in four groups: I. Executives and managers; II. Intermediate occupations, skilled technical, self-employed; III. Primary sector skilled workers; IV. Unskilled workers); and nationality (Spanish or foreign).

*Psychosocial variables:* social support (emotional and personal support collated by means of the Duke-UNC Functional Social Support Questionnaire) (Bellón Saameño et al., 1996).

### *Contextual Socio-economic Independent Variables*

The contextual socio-economic variables were selected on the basis of their availability for the years analysed and the degree of disaggregation by region (Additional file 1). The geographical unit of analysis was based on Eurostat NUTS-2 regions (known as Autonomous Communities in Spain).

*Economic indicators:* Gross Domestic Product (GDP) per capita at current prices (ratio to the average for Spain × 100), risk of poverty (%), income per capita per household (ratio to the Spain average × 100).

*Public welfare services indicators:* healthcare spending per capita (euros).

*Labour market indicators:* employment rate (total number of employed persons/total population × 100), unemployment rate (total number of unemployed persons/active population × 100), percentage of temporary workers.

*Procedure*

Data on individuals were obtained from the Spanish National Health Survey (SNHS) for 2006, 2012 and 2017 (Ministry of Health, Consumption and Social Welfare, 2021). This is a cross-sectional population-based survey conducted by the National Statistics Institute, working with the Ministry of Health, Social Services and Equality, which collates health information by household. A three-stage sampling method was used, stratified into census sections, family dwellings and persons, and the data were gathered through computer-assisted personal interviews. This study is exempt of approval by the Ethics Committee because there was no patient or public involvement in this study.

To calculate contextual socio-economic indicators, we used data from the National Statistics Institute (GDP per capita, income per capita per household and risk of poverty) (National Statistics Institute, 2021a, 2021b), Eurostat (employment and unemployment rates, percentage of temporary workers) (EUROSTAT, 2021), and the BBVA Foundation (healthcare spending per capita) (Abellán Perpiñán, 2013).

*Data analysis*

All the analyses were performed by sex (male/female) and for the total population. Prevalence was calculated for the psychiatric morbidity (PM) variable and the independent proportions comparison test was applied to compare significant changes. The chi-square test was used to compare bivariate determinants between the three periods.

Two multilevel logistic regression models with random effect were constructed to determine change in MH according to individual and contextual variables respectively. In the first model, the study period and predictor variables at the individual and socio-economic level were included, and intercepts at the NUTS-2 region level were included as random effect. In the second model, contextual variables were included individually (to avoid collinearity) and adjusted for individual characteristics, and intercepts at the NUTS-2 region level were included as random effect.

In all models, the Wald test was used for each predictor to assess whether the differences were significant. The clustered robust variance was corrected using the observed information matrix (OIM). The magnitude of effects was measured by the odds ratio (OR) and 95% confidence interval, and a significance level of 0.05 was set for hypothesis checking. In the indicator models for the macroeconomic context, the magnitude of association was expressed for a change of approximately one standard deviation of the contextual variable analysed. Statistical analyses were performed using Stata software (StataCorp., TX).

Results

Total PM decreased over the three periods studied: 22.8% in 2006, 22.0% in 2012 and 18.8% in 2017. In all three the frequency of PM was greater in women than in men: 27.4% vs 15.7% in 2006, 25.9% vs 17.5% in 2012 and 22.6% vs 14.4% in 2017.

Table 1 shows the frequency of PM according to the individual socio-economic factors. The highest frequencies were obtained in the 45-59 age group for men and in those aged 60 or more for women. In terms of marital status, widowed and separated or divorced subjects showed a higher frequency of PM both in men and in women, followed in the latter case by married women. Among employment situations, the unemployed showed the highest frequencies of PM in men and women, with no significant differences in the years studied. The same occurred in subjects with no formal education, with significant differences between years in women, but not in men. In all three years the frequency of PM increased as socio-professional class decreased, both in women and in men, though in the latter the differences were not significant. Finally, the highest frequencies of PM were obtained in subjects with low social support and who were born in Spain.

According to the first multilevel logistic regression model (Table 2), the risk of PM for men decreased in 2017 compared to 2006 (OR: 0.80, CI 95%: 0.73-0.87). By age, the risk was higher in the 30-44 group (OR: 1.30, CI 95%: 1.13-1.49) than in those aged 15-29, while in the groups aged 45-59 (OR: 0.80, CI 95%: 0.66-0.97) and 60 or more (OR: 0.67, CI 95%: 0.54-0.84) the risk decreased. As for marital status, both widowed (OR: 1.69, CI 95%: 1.46-1.97) and separated or divorced men (OR: 1.42, CI 95%: 1.23-1.64) showed a higher risk than single ones. Among those born abroad a lower risk was observed than in those born in Spain (OR: 0.82, CI 95%: 0.72-0.95). With regard to employment situation an increased risk was observed in the unemployed (OR: 2.70, CI 95%: 2.44-2.99), retired (OR: 2.17, CI 95%: 1.89-2.49) and those engaged in housekeeping (OR: 1.64, CI 95%: 1.18-2.29) compared to men doing paid work. The risk was higher in men with no formal education (OR: 1.97, CI 95%: 1.49-2.61) and with a low level (OR: 1.35, CI 95%: 1.22-1.49) or medium level of education (OR: 1.17, CI 95%: 1.05-1.31) compared to those with a high level. The risk decreased with each point of increase in social support (OR: 0.31, CI 95%: 0.27-0.35). Finally, there were no significant differences by social class.

Among women, the risk of PM decreased in 2012 (OR: 0.85, CI 95%: 0.80-0.90) and in 2017 (OR: 0.72, CI 95%: 0.68-0.77) compared to 2006. The risk increased in the 45-59 age group (OR: 1.17, CI 95%: 1.04-1.30) and in those aged 60 or more (OR: 1.16, CI 95%: 1.02-1.32) by comparison with the younger age group. A higher risk was observed in widows (OR: 1.34, CI 95%: 1.22-1.48) and in separated or divorced women (OR: 1.51, CI 95%: 1.35-1.68) than in single women. The risk was greater in women who were unemployed (OR: 1.58, CI 95%: 1.45-1.72), retired (OR: 1.37, CI 95%: 1.24-1.51) or engaged in housework (OR: 1.22, CI 95%: 1.13-1.32) than in those doing paid work. In women with no formal education (OR: 1.76, CI 95%: 1.50-2.07) and also those with a low level (OR: 1.35, CI 95%: 1.25-1.46) or medium level of education (OR: 1.17, CI 95%: 1.08-1.28) an increased risk was observed compared to those who had undertaken further or higher education. Finally, an increase in risk was observed in less qualified female workers according to the socio-professional classification (OR: 1.35, CI 95%: 1.24-1.47). The risk decreased with each point of increase in social support (OR: 0.25, CI 95%: 0.22-0.27) and no differences by country of birth were observed (Table 2).

According to the second multilevel logistic regression model, among the macroeconomic variables studied, those associated with worse mental health were lower healthcare spending per capita, higher employment rate, lower unemployment rate and higher

percentage of temporary workers. By contrast, risk of poverty, income per capita per household and Gross Domestic Product were not found to be linked to worse mental health (Table 3). These observed associations were essentially to the detriment of women, among whom the risk of bad mental health became greater as per capita healthcare spending decreased (OR: 1.06, CI 95%: 1.04-1.08) and as the percentage of temporary workers increased (OR: 1.10, CI 95%: 1.07-1.13) and was lower when the rate of employment decreased (OR: 0.89, CI 95%: 0.86-0.92) and the unemployment rate increased (OR: 0.94, CI 95%: 0.93-0.96). In men a similar association to that of women was observed only with the employment and unemployment rates.

The predictive ability of the full multilevel model at the first level (individual) was 0.10 based on the McKelvey & Zavoina's pseudo-R2 coefficient. On the other hand, the proportion of variability explained by the second level (autonomous communities) was 1.51% (rho coefficient).

## Discussion

The relationship between economic crisis and the mental health of the population has been studied before (Córdoba-Doña et al., 2016; Moncho et al., 2018; Parmar et al., 2016; Toffolutti & Suhrcke, 2014), but the study presented here did not detect this relationship either during the 2008 crisis or some years later. The results indicate a decrease in PM in the Spanish population over the three periods studied: 22.8% in 2006, 22.0% in 2012 and 18.8% in 2017.

*Table 1*
Prevalence of PM (according to individual socio-economic factors), 2006, 2012 and 2017

| | MEN | | | WOMEN | | | TOTAL | | |
|---|---|---|---|---|---|---|---|---|---|
| | 2006 (n=11110) | 2012 (n=9462) | 2017 (n=10492) | 2006 (n=17124) | 2012 (11112) | 2017 (n=12239) | 2006 (n=28234) | 2012 (n=20574) | 2017 (n=22821) |
| **PM** *(n, %)* | 1747 (15.7) | 1656 (17.5) | 1513 (14.4) | 4686 (27.4) | 2876 (25.9) | 2771 (22.6) | 6433 (22.8) | 4532 (22.0) | 4284 (18.8) |
| **Age** *(n, %)* | | | | | | | | | |
| 15-29 | 215 (12.3) | 186 (14.0) | 116 (9.3) | 476 (22.3) | 227 (17.3) | 223 (17.3) | 691 (17.8) | 413 (15.7) | 339 (13.3) |
| 30-34 | 475 (14.2) | 474 (17.0) | 333 (12.9) | 1116 (23.0) | 646 (23.4) | 493 (17.3) | 1591 (19.4) | 1120 (20.2) | 826 (15.2) |
| 45-59 | 415 (16.1) | 492 (19.9) | 480 (16.2) | 1058 (25.8) | 719 (27.0) | 730 (23.0) | 1473 (22.0) | 1211 (23.6) | 1210 (19.7) |
| ≥60 | 642 (18.7) | 504 (17.5) | 584 (15.8) | 2036 (33.8) | 1284 (29.4) | 1325 (26.4) | 2678 (28.3) | 1788 (24.7) | 1909 (21.9) |
| **Marital status** *(n, %)* | | | | | | | | | |
| Single | 521 (14.4) | 523 (17.2) | 446 (14.6) | 818 (23.2) | 581 (21.8) | 508 (18.4) | 1339 (18.7) | 1104 (19.3) | 954 (16.4) |
| Married | 926 (14.5) | 900 (16.7) | 799 (12.8) | 2440 (25.2) | 1291 (23.7) | 1228 (20.1) | 3366 (20.9) | 2191 (20.2) | 2027 (16.4) |
| Widowed | **155 (26.7)** | **108 (23.9)** | **130 (26.8)** | 1075 (37.2) | 732 (33.3) | 736 (31.7) | 1230 (35.5) | 840 (31.7) | 866 (29.9) |
| Separated or Divorced | 143 (27.2) | 125 (22.9) | 137 (20.1) | 349 (35.3) | 269 (34.0) | 296 (28.7) | 492 (32.5) | 394 (29.5) | 433 (25.3) |
| **Employment situation** *(n, %)* | | | | | | | | | |
| Working | 780 (12.1) | 582 (12.9) | 488 (9.4) | 1456 (21.9) | 728 (19.7) | 743 (15.9) | 2236 (17.0) | 1310 (15.9) | 1231 (12.5) |
| Unemployed | **158 (26.2)** | **386 (28.1)** | **300 (26.6)** | **339 (29.2)** | **369 (31.5)** | **389 (29.0)** | **497 (28.2)** | **755 (29.6)** | **689 (27.9)** |
| Retired | 724 (21.1) | 466 (18.4) | 514 (16.3) | 1521 (36.3) | 791 (30.5) | 912 (27.4) | 2245 (29.5) | 1257 (24.5) | 1426 (22.0) |
| Studying | **54 (10.9)** | **61 (11.5)** | **55 (8.6)** | 130 (21.9) | 91 (16.4) | 106 (16.4) | 184 (16.9) | 152 (14.0) | 161 (12.5) |
| Housekeeping | **4 (28.6)** | **42 (18.1)** | **2 (8.0)** | 1165 (26.7) | 786 (27.4) | 498 (23.7) | 1169 (26.7) | 828 (26.8) | 500 (23.5) |
| **Level of education** *(n, %)* | | | | | | | | | |
| No formal education | **32 (25.0)** | **28 (24.1)** | **33 (28.4)** | 200 (43.8) | 116 (34.2) | 119 (41.2) | 232 (39.7) | 144 (31.6) | 152 (37.5) |
| Low | 1069 (17.5) | 1037 (19.5) | 939 (16.8) | 3117 (30.5) | 1853 (28.9) | 1703 (26.0) | 4186 (25.7) | 2890 (24.6) | 2642 (21.8) |
| Medium | 337 (14.9) | 317 (15.7) | 255 (12.2) | 702 (24.0) | 500 (23.6) | 456 (19.9) | 1039 (20.0) | 817 (19.7) | 711 (16.2) |
| High | 306 (11.9) | 276 (13.3) | 286 (10.5) | 656 (18.9) | 414 (18.2) | 493 (15.4) | 962 (15.9) | 690 (15.8) | 779 (13.2) |
| **Socio-professional class** *(n, %)* | | | | | | | | | |
| I | 280 (12.9) | 264 (15.1) | 201 (10.6) | 642 (20.6) | 363 (19.0) | 319 (15.0) | 922 (17.5) | 627 (17.2) | 520 (12.9) |
| II | **444 (15.6)** | **254 (15.3)** | **502 (13.7)** | 1142 (26.6) | 506 (24.7) | 786 (20.6) | 1586 (22.2) | 760 (20.5) | 1288 (17.2) |
| III | **488 (15.2)** | **262 (16.9)** | **535 (15.1)** | 1226 (27.7) | 347 (25.0) | 970 (24.2) | 1714 (22.4) | 609 (20.8) | 1505 (20.0) |
| IV | **508 (18.2)** | **849 (19.5)** | **261 (20.2)** | 1521 (31.3) | 1498 (29.0) | 577 (30.3) | 2,029 (26.6) | 2347 (24.6) | 838 (26.2) |
| **Social support** *(n, %)* | | | | | | | | | |
| Low | **182 (44.3)** | **120 (37.2)** | **182 (43.9)** | 394 (64.4) | 231 (53.4) | 281 (57.8) | 576 (56.3) | 351 (46.4) | 463 (51.4) |
| Normal | 1565 (14.6) | 1536 (16.8) | 1331 (13.2) | 4292 (26.0) | 2645 (24.8) | 2490 (21.0) | 5857 (21.5) | 4181 (21.1) | 3821 (17.4) |
| **Nationality** *(n, %)* | | | | | | | | | |
| Spanish | 1624 (15.7) | 1546 (17.5) | 1443 (14.7) | 4390 (27.2) | 2718 (26.1) | 2629 (22.7) | 6014 (22.7) | 4264 (22.1) | 4072 (19.0) |
| Foreign | 123 (16.0) | 110 (17.9) | 70 (10.6) | 293 (29.7) | 158 (23.2) | 142 (18.4) | 416 (23.7) | 268 (20.7) | 212 (14.8) |

*Note:* Socio-professional class: I. Executives and managers; II. Intermediate occupations, skilled technical, self-employed; III. Primary sector skilled workers; IV. Unskilled workers. Values in bold: p > .05

*Table 2*
Multi-level logistic regression model with random effects at NUTS-2 region level according to individual socio-economic factors for PM (GHQ ≥ 3)

| Variable | MEN | | | WOMEN | | |
|---|---|---|---|---|---|---|
| | OR | 95% CI | p-value | OR | 95% CI | p-value |
| Year | | | | | | |
| **2006** | 1 | – | – | 1 | – | – |
| **2012** | 0.97 | (0.90 - 1.06) | .528 | 0.85 | (0.80 - 0.90) | <.001 |
| **2017** | 0.80 | (0.73 - 0.87) | <.001 | 0.72 | (0.68 - 0.77) | <.001 |
| Age group | | | | | | |
| **16-29** | 1 | – | – | 1 | – | – |
| **30-44** | 1.30 | (1.13 - 1.49) | <.001 | 1.08 | (0.97 - 1.20) | .168 |
| **45-59** | 0.80 | (0.66 - 0.97) | .002 | 1.17 | (1.04 - 1.30) | .007 |
| **≥60** | 0.67 | (0.54 - 0.84) | .020 | 1.16 | (1.02 - 1.32) | .022 |
| Marital status | | | | | | |
| **Single** | 1 | - | - | 1 | - | - |
| Married | 0.99 | (0.91 - 1.08) | .833 | 1.01 | (0.94 - 1.09) | .802 |
| Widowed | 1.69 | (1.46 - 1.97) | <.001 | 1.34 | (1.22 - 1.48) | <.001 |
| **Separated or Divorced** | 1.42 | (1.23 - 1.64) | <.001 | 1.51 | (1.35 - 1.68) | <.001 |
| Nationality | | | | | | |
| **Spanish** | 1 | – | – | 1 | – | – |
| **Foreign** | 0.82 | (0.72 - 0.95) | .006 | 0.99 | (0.89 - 1.10) | .874 |
| Employment situation | | | | | | |
| **Working** | 1 | – | – | 1 | – | – |
| **Unemployed** | 2.70 | (2.44 - 2.99) | <.001 | 1.58 | (1.45 - 1.72) | <.001 |
| **Retired** | 2.17 | (1.89 - 2.49) | <.001 | 1.37 | (1.24 - 1.51) | <.001 |
| **Studying** | 1.07 | (0.87 - 1.32) | .503 | 1.09 | (0.93 - 1.27) | .287 |
| **Housekeeping** | 1.64 | (1.18 - 2.29) | .003 | 1.22 | (1.13 - 1.32) | <.001 |
| Level of education | | | | | | |
| **High** | 1 | – | – | 1 | – | – |
| **Medium** | 1.17 | (1.05 - 1.31) | .004 | 1.17 | (1.08 - 1.28) | <.001 |
| **Low** | 1.35 | (1.22 - 1.49) | <.001 | 1.35 | (1.25 - 1.46) | <.001 |
| **No formal education** | 1.97 | (1.49 - 2.61) | <.001 | 1.76 | (1.50 - 2.07) | <.001 |
| Socio-professional class | | | | | | |
| **I** | 1 | – | – | 1 | – | – |
| **II** | 1.01 | (0.90 - 1.12) | .907 | 1.18 | (1.09 - 1.29) | <.001 |
| **III** | 0.94 | (0.84 - 1.05) | .277 | 1.23 | (1.13 - 1.34) | <.001 |
| **IV** | 1.06 | (0.95 - 1.19) | .305 | 1.35 | (1.24 - 1.47) | <.001 |
| Social support (↑1 point) | 0.31 | (0.27 - 0.35) | <.001 | 0.25 | (0.22 - 0.27) | <.001 |

*Note:* Socio-professional class*:* I. Executives and managers; II. Intermediate occupations, skilled technical, self-employed; III. Primary sector skilled workers; IV. Unskilled workers

*Table 3*
Odds Ratio of risk of PM (GHQ ≥ 3) of the multi-level logistic regression model with random effects at NUTS-2 region level according to contextual socio-economic factors

| Variable | TOTAL | | | MEN | | | WOMEN | | |
|---|---|---|---|---|---|---|---|---|---|
| | aOR | 95% CI | p-value | aOR | 95% CI | p-value | aOR | 95% CI | p-value |
| **Healthcare spending per capita (↓100€ person/year)** | 1.03 | (1.01 - 1.05) | .001 | 0.98 | (0.95 - 1.00) | .082 | 1.06 | (1.04 - 1.08) | <.001 |
| **Risk of poverty (↑5 points)** | 0.99 | (0.95 - 1.03) | .583 | 0.99 | (0.93 - 1.05) | .758 | 0.98 | (0.94 - 1.02) | .236 |
| **Income per capita per household (↓5 points)** | 1.00 | (0.97 - 1.02) | .836 | 1.00 | (0.96 - 1.04) | .974 | 1.00 | (0.97 - 1.02) | .706 |
| **Gross Domestic Product (↓5 points)** | 0.99 | (0.96 - 1.01) | .255 | 0.98 | (0.95 - 1.01) | .216 | 0.99 | (0.97 - 1.01) | .515 |
| **Employment rate (↓5 points)** | 0.90 | (0.88 - 0.93) | <.001 | 0.93 | (0.88 - 0.97) | .001 | 0.89 | (0.86 - 0.92) | <.001 |
| **Unemployment rate (↑5 points)** | 0.96 | (0.94 - 0.97) | <.001 | 0.97 | (0.95 - 0.99) | .044 | 0.94 | (0.93 - 0.96) | <.001 |
| **Percentage of temporary workers (↑5 points)** | 1.07 | (1.05 - 1.10) | <.001 | 1.03 | (0.99 - 1.06) | .179 | 1.10 | (1.07 - 1.13) | <.001 |

*Note*: aOR: Adjusted for age, state of health, social class, employment situation, level of education, marital status, nationality and social support

A result that does appear constantly in the literature is the greater prevalence of PM in women than in men (World Health Organization, 2019), as our results show. Traditionally these differences have been explained on the basis of gender roles and stereotypes, according to which the greater vulnerability of women is related to their diversity of roles in the community, family and employment contexts (Henares Montiel et al., 2020; Piccinelli et al., 1997; Silva et al., 2016). This study clearly shows that the difference still exists and that there are certain socio-economic factors that affect both men and women, but with different nuances.

With regard to individual socio-economic factors, for example, in the case of women the risk of PM increases in the intermediate and low socio-professional classes. And in the case of men the results reflect their preponderant role as the "breadwinner" of the household, so that the risk of PM increases, regardless of the declared social class, in the 30-44 age group, which merits special attention if the subjects are also unemployed or retired. As has already been shown previously, this study reveals the important role of social support as a protective factor for PM, although that role has hardly been studied in the case of men (Ricci-Cabello et al., 2010; Ruiz-Pérez et al., 2011). And on the other hand we find that in the periods after the 2008 crisis, foreign men did not prove to be as vulnerable as natives, as has also been previously established in Spain (Henares-Montiel et al., 2018).

With regard to the contextual socio-economic factors associated with PM, in the period after the crisis we find, both in men and in women, an increase in the unemployment rate and a decrease in the employment rate associated with a lower risk of PM, and an increase in the percentage of temporary workers associated with a higher risk of PM. One might expect that the employment created in the post-crisis period would be reflected in an improvement in the mental health of the population. But it is precarious employment, of a temporary nature, with a great deal of uncertainty and insecurity, and this could explain the fact that an increase in the percentage of temporary workers is associated with a higher risk of PM (Caroli & Godard, 2016). And finally, the decrease in healthcare spending in 2017 is associated with a higher risk of PM in women. Women consume more psychiatric drugs and make more use of health services (Urbanos Garrido, 2011; Markez et al., 2004), and therefore this result is probably related to austerity policies and cuts in certain services more commonly used by women (ONGs España, 2017).

The limitations of this study include those inherent to survey-based research. Given its cross-sectional nature, the possibility of reverse causality cannot be ruled out. There may be some uncontrolled confusion bias, given that other variables not taken into account (some collected in surveys and others not) may or may not have an effect on the state of mental health. Yet in spite of these limitations, our study is the first of its kind to analyse a multilevel design to investigate the impact of contextual variables in Spain and its possible consequences for mental health on the basis of three health surveys with substantial sample sizes.

In conclusion, a previous comparative analysis of the 2006 and 2012 SNHSs indicated that an increase in the percentage of temporary workers was associated with a lower rate of PM, both in men and in women (Ruiz-Pérez et al., 2017). The results of this new study show that in 2017, when the worst impact of this crisis had passed, the increase in temporary work became a risk factor for PM in general and the decrease in healthcare spending became a risk factor for PM in women.

Therefore, it could be pointing at an association between austerity policies and restriction of public spending and a higher risk of PM in the period after the crisis. It is possible that not only unemployment but also insecure employment entails a risk to mental health. In periods of high unemployment, being out of work in itself represents a minor deviation from the social norm (having a job) and much of the employment created no longer guarantees the basic levels of security, status and social cohesion that it had achieved in previous decades. Precarious employment therefore expresses a questioning of the social norm of stable, secure jobs and increases uncertainty over prospects for pursuing an independent and satisfactory life (Clark et al., 2010; Prieto Rodríguez, 2002).

This suggests that some of the inequalities in mental health could be avoided, which should lead us to think carefully before instituting austerity policies in future economic and financial crises.

## References

Abellán Perpiñán, J. (2013). *El sistema sanitario público en España y sus comunidades autónomas: sostenibilidad y reformas* [The public health system in Spain and its autonomous communities: Sustainability and reforms]. BBVA Foundation. https://www.fbbva.es/wp-content/uploads/2017/05/dat/DE_2013_IVIE_sistema_sanitario.pdf

Arias-De La Torre, J., Artazcoz, L., Molina, A. J., Fernández-Villa, T., & Martín, V. (2016). Inequalities in mental health in the working population of Spain: A National Health Survey-based study. *National Health Survey*, *30*(5), 339-344. https://doi.org/10.1016/j.gaceta.2016.02.011

Arias-de la Torre, J., Molina, A. J., Fernández-Villa, T., Artazcoz, L., & Martín, V. (2018). Mental health, family roles and employment status inside and outside the household in Spain. *Gaceta Sanitaria*. https://doi.org/10.1016/j.gaceta.2017.11.005

Bacigalupe, A., Martín, U., Font, R., González-Rábago, Y., & Bergantiños, N. (2016). Austeridad y privatización sanitaria en época de crisis: ¿existen diferencias entre las comunidades autónomas? [Austerity and healthcare privatization in times of crisis: Are there any differences among autonomous communities?]. *Gaceta Sanitaria*, *30*(1), 47-51. https://doi.org/10.1016/j.gaceta.2015.10.003

Bartoll, X., Palència, L., Malmusi, D., Suhrcke, M., & Borrell, C. (2014). The evolution of mental health in Spain during the economic crisis. *European Journal of Public Health*, *24*(3), 415-418. https://doi.org/10.1093/eurpub/ckt208

Bellón Saameño, J. A., Delgado Sánchez, A., Luna del Castillo, J. D., & Lardelli Claret, P. (1996). Validity and reliability of the Duke-UNC-11 questionnaire of functional social support. *Atención Primaria*, *18*(4), 153-163.

Cabrera-León, A., Ferri-García, R., Navarro, S., Sáez, M., & Daponte Codina, A. (2017). Comparabilidad de las ediciones 2006/07 y 2011/12 de la Encuesta Nacional de Salud de España [Comparability of the editions 2006/07 and 2011/12 of the Spanish Health Survey]. *Revista Española de Salud Pública*, *91*. http://scielo.isciii.es/scielo.php?script=sci_arttext&pid=S1135-57272017000100212&lng=es&nrm=iso

Caroli, E., & Godard, M. (2016). Does job insecurity deteriorate health? *Health Economics*, *25*(2), 131-147. https://doi.org/10.1002/hec.3122

Clark, A., Knabe, A., & Rätzel, S. (2010). Boon or bane? Others' unemployment, well-being and job insecurity. *Labour Economics*, *17*(1), 52-61. https://doi.org/10.1016/j.labeco.2009.05.007

Córdoba-Doña, J. A., Escolar-Pujolar, A., San Sebastián, M., & Gustafsson, P. E. (2016). How are the employed and unemployed affected by the economic crisis in Spain? Educational inequalities, life conditions and mental health in a context of high unemployment. *BMC Public Health*, *16*, 267. https://doi.org/10.1186/s12889-016-2934-z

Economou, M., Peppou, L. E., Souliotis, K., Konstantakopoulos, G., Papaslanis, T., Kontoangelos, K., Nikolaidi, S., & Stefanis, N. (2019). An association of economic hardship with depression and suicidality in times of recession in Greece. *Psychiatry Research, 279*, 172-179. https://doi.org/10.1016/j.psychres.2019.02.058

European Commission (2021). *Public Health Research*. https://ec.europa.eu/info/research-and-innovation/research-area/health-research-and-innovation/public-health-research_en

EUROSTAT (2021). *Regional Labour Market Statistics*. https://ec.europa.eu/eurostat/web/main/home

Gili, M., López-Navarro, E., Castro, A., Homar, C., Navarro, C., García-Toro, M., García-Campayo, J., & Roca, M. (2016). Gender differences in mental health during the economic crisis. *Psicothema, 28*(4), 407-413. https://doi.org/10.7334/psicothema2015.288

Haro, J. M., Ayuso-Mateos, J. L., Bitter, I., Demotes-Mainard, J., Leboyer, M., Lewis, S. W., Linszen, D., Maj, M., McDaid, D., Meyer-Lindenberg, A., Robbins, T. W., Schumann, G., Thornicroft, G., Van Der Feltz-Cornelis, C., Van Os, J., Wahlbeck, K., Wittchen, H.-U., Wykes, T., Arango, C., … Walker-Tilley, T. (2014). ROAMER: Roadmap for mental health research in Europe. *International Journal of Methods in Psychiatric Research*, *23*(Suppl 1), 1-14. https://doi.org/10.1002/mpr.1406

Henares Montiel, J., Ruiz-Pérez, I., & Sordo, L. (2020). Salud mental en España y diferencias por sexo y por comunidades autónomas [Mental health in Spain and differences by sex, and by autonomous communities]. *Gaceta Sanitaria, 34*(2), 114-119. https://doi.org/10.1016/j.gaceta.2019.03.002

Henares-Montiel, J., Ruiz-Perez, I., & Mendoza-García, O. (2018). Health inequalities between male and female immigrants in Spain after the beginning of the economic crisis. *Health & Social Care in the Community*, *26*(6), 891-897. https://doi.org/10.1111/hsc.12613

Konstantakopoulos, G., Pikouli, K., Ploumpidis, D., Bougonikolou, E., Kouyanou, K., Nystazaki, M., & Economou, M. (2019). The impact of unemployment on mental health examined in a community mental health unit during the recent financial crisis in Greece. *Psychiatrike*, *30*(4), 281-290. https://doi.org/10.22365/jpsych.2019.304.281

Leinsalu, M., Reile, R., & Stickley, A. (2019). Economic fluctuations and long-term trends in depression: A repeated cross-sectional study in Estonia 2004-2016. *Journal of Epidemiology and Community Health, 73*(11), 1026-1032. https://doi.org/10.1136/jech-2018-211939

Markez, I., Póo, M., Romo, N., Meneses, C., Gil, E., & Vega, A. (2004). Mujeres y psicofármacos: la investigación en atención primaria [Women and psychotropics: The researching in the field of Primary Care]. *Revista de la Asociación Española de Neuropsiquiatría*, *91*, 37-61. http://scielo.isciii.es/scielo.php?script=sci_abstract&pid=S0211-57352004000300004

Medel-Herrero, A., & Gómez-Beneyto, M. (2019). Impacto de la crisis económica del 2008 en el número de jóvenes hospitalizados por patología psiquiátrica [The impact of the 2008 economic crisis on the increasing number of young psychiatric inpatients]. *Revista de Psiquiatría y Salud Mental*, *12*(1), 28-36. https://doi.org/10.1016/j.rpsm.2017.10.002

Ministry of Health, Consumption and Social Welfare (2021). *National Health Survey in Spain*. https://pestadistico.inteligenciadegestion.mscbs.es/publicoSNS/Comun/DefaultPublico.aspx

Moncho, J., Pereyra-Zamora, P., Tamayo-Fonseca, N., Giron, M., Gómez-Beneyto, M., & Nolasco, A. (2018). Is recession bad for your mental health? The answer could be complex: Evidence from the 2008 crisis in Spain. *BMC Medical Research Methodology*, *18*(1), 78. https://doi.org/10.1186/s12874-018-0538-2

National Statistics Institute (2021a). *Living Conditions Survey. Base 2004*. https://www.ine.es/dynt3/inebase/index.htm?padre=792&capsel=792

National Statistics Institute (2021b). *Spanish Regional Accounts*. https://ine.es/dyngs/INEbase/es/operacion.htm?c=Estadistica_C&cid=125473616 7628&menu=resultados&idp=1254735576581#!tabs-1254736158133

Odone, A., Landriscina, T., Amerio, A., & Costa, G. (2018). The impact of the current economic crisis on mental health in Italy: Evidence from two representative national surveys. *European Journal of Public Health*, *28*(3), 490-495. https://doi.org/10.1093/eurpub/ckx220

Oliva, J., López-Varcárcel, B. G., Pérez, P. B., Peña-Longobardo, L. M., Garrido, R. M. U., & González, N. Z. (2020). El impacto de la Gran Recesión en la salud mental en España. Informe SESPAS 2020 [Impact of Great Recession on mental health in Spain. SESPAS Report 2020]. *Gaceta Sanitaria, 34*(S1), 48-53. https://doi.org/10.1016/j.gaceta.2020.05.009

ONGs España (2017). *Deficiencias e inequidad en los servicios de salud sexual y reproductiva en España* [Deficiencies and inequity in sexual and reproductive health services in Spain]. https://issuu.com/felipe.giner/docs/mdm_informe_-_baja

Othman, N., Ahmad, F., El Morr, C., & Ritvo, P. (2019). Perceived impact of contextual determinants on depression, anxiety and stress: A survey with university students. *International Journal of Mental Health Systems*, *13*(1), 17. https://doi.org/10.1186/s13033-019-0275-x

Parmar, D., Stavropoulou, C., & Ioannidis, J. P. A. (2016). Health outcomes during the 2008 financial crisis in Europe: Systematic literature review. *BMJ (Clinical Research Ed.)*, *354*, i4588. https://doi.org/10.1136/bmj.i4588

Piccinelli, M., & Gómez Homen, F. (1997). *Gender differences in the epidemiology of affective disorders and schizophrenia*. World Health Organization. https://www.who.int/mental_health/publications/gender_schizophrenia/en/

Prieto Rodríguez, C. (2002). La degradación del empleo o la norma social del empleo flexibilizado [The degradation of employment or the social norm of flexible employment]. *Sistema: Revista de Ciencias Sociales*, *168*, 89-106.

Red Nacional de Vigilancia Epidemiológica (2018). *Salud Mental y Salud Pública en España: Vigilancia Epidemiológica* [Mental Health and Public Healht in Spain: Epidemiological Surveillance]. Instituto de Salud Carlos III. Centro Nacional de Epidemiología. http://gesdoc.isciii.es/gesdoccontroller?action=download&id=09/01/2018-44802ce4e8

Ricci-Cabello, I., Ruiz-Pérez, I., Plazaola-Castaño, J., & Montero-Piñar, I. (2010). Morbilidad psíquica, existencia de diagnóstico y consumo de psicofármacos: diferencias por comunidades autónomas según la Encuesta Nacional de Salud de 2006 [Mental Disease, Existence of Diagnostic, Use of Psychotropic Medication. Differences by Autonomous Communities under the National Health Survey 2006]. *Revista Española de Salud Pública*, *84*(1), 29-41. http://scielo.isciii.es/scielo.php?script=sci_arttext&pid=S1135-57272010000100004

Rocha, K. B., Pérez, K., Rodríguez-Sanz, M., Borrell, C., & Obiols, J. E. (2011). Propiedades psicométricas y valores normativos del General Health Questionnaire (GHQ-12) en población general española [Psychometric properties and normative values of the General Health Questionnaire (GHQ-12) in the general Spanish population]. *International Journal of Clinical and Health Psychology, 11*(1), 125-139. https://www.redalyc.org/articulo.oa?id=33715423008

Rohlfs, I., Borrell, C., Anitua, C., Artazcoz, L., Colomer, C., Escribá, V., García-Calvente, M., Llacer, A., Mazarrasa, L., Pasarín, M. I., Peiró, R., & Valls-Llobet, C. (2000). La importancia de la perspectiva de género en las encuestas de salud [The importance of the gender perspective in health surveys]. *Gaceta Sanitaria*, *14*(2), 146-155. https://doi.org/10.1016/S0213-9111(00)71448-8

Ruiz-Pérez, I., Bermúdez-Tamayo, C., & Rodríguez-Barranco, M. (2017). Socio-economic factors linked with mental health during the recession: A multilevel analysis. *International Journal for Equity in Health*, *16*(1), 45. https://doi.org/10.1186/s12939-017-0518-x

Ruiz-Pérez, I., Ricci-Cabello, I., Plazaola-Castaño, J., Montero-Piñar, M. I., & Escribá-Agüir, V. (2011). The relationship between reproductive work and sociodemographic and psychosocial factors in regard to psychological distress in men and women in Spain. *Prevention Science: The Official Journal of the Society for Prevention Research*, *12*(4), 423-434. https://doi.org/10.1007/s11121-011-0224-7

Sánchez-López, M. P., & Dresch, V. (2008). The 12-Item General Health Questionnaire (GHQ-12): Reliability, external validity and factor structure in the Spanish population. *Psicothema*, *20*(4), 839-843.

Silva, M., Loureiro, A., & Cardoso, G. (2016). Social determinants of mental health: A review of the evidence. *The European Journal of Psychiatry*, *30*(4), 259-292. http://scielo.isciii.es/scielo.php?script=sci_abstract&pid=S0213-61632016000400004

Tamayo-Fonseca, N., Nolasco, A., Moncho, J., Barona, C., Irles, M., Más, R., Girón, M., Gómez-Beneyto, M., & Pereyra-Zamora, P. (2018). Contribution of the Economic Crisis to the Risk Increase of Poor Mental Health in a Region of Spain. *International Journal of Environmental Research and Public Health*, *15*(11), 2517. https://doi.org/10.3390/ijerph15112517

Toffolutti, V., & Suhrcke, M. (2014). Assessing the short term health impact of the Great Recession in the European Union: A cross-country panel analysis. *Preventive Medicine*, *64*, 54-62. https://doi.org/10.1016/j.ypmed.2014.03.028

Urbanos Garrido, R. M. (2011). Determinantes de salud y utilización de servicios sanitarios: un análisis de desigualdad desde la perspectiva de género [Determinants of health and use of health services: An analysis of inequality from a gender perspective]. *Presupuesto y Gasto Público*, *64*, 117-130.

World Health Organization (2013). *Mental health action plan 2013-2020*. WHO. http://apps.who.int/iris/bitstream/10665/89966/1/9789241506021_eng.pdf

World Health Organization (2019). *World health statistics overview 2019: Monitoring health for the SDGs, sustainable development goals*. WHO. https://apps.who.int/iris/bitstream/handle/10665/324835/9789241565707-eng.pdf?sequence=9&isAllowed=y