

Enduring financial crisis in Greece: prevalence and correlates of major depression and suicidality

Marina Economou^{1,2} · Elias Angelopoulos^{1,2} · Lily Evangelia Peppou¹ ·
Kyriakos Souliotis^{3,4} · Chara Tzavara⁴ · Konstantinos Kontoangelos^{1,2} ·
Michael Madianos⁵ · Costas Stefanis¹

Received: 9 September 2015 / Accepted: 8 May 2016 / Published online: 13 May 2016
© Springer-Verlag Berlin Heidelberg 2016

Abstract

Purpose A series of repeated cross-sectional surveys conducted in 2008, 2009, 2011 and 2013 were conducted with the aim of estimating the prevalence of major depression and suicidality as well as of investigating its risk factors. The present report concentrates on the 2013 survey.

Methods A random and representative sample of 2,188 people was telephone interviewed with regard to various socio-economic indicators and the presence of major depression and suicidality, which were assessed with the germane module of the Structured Clinical Interview.

Results Findings suggest a rise in 1-month prevalence of major depression (12.3 %) and a decline in prevalence of suicidality (2.8 %). Female gender, residence in rural area, low educational attainment, unemployment and economic hardship were found to increase the odds of suffering from major depression. The influence of economic hardship and

unemployment on suicidality was also substantial and independent of major depression.

Conclusions Results stress the imperative need for the design and implementation of social policies and interventions that would offset the dire impact of the sustained recession in Greece.

Keywords Recession · Unemployment · Affective disorders · Mental health · Economic hardship

Introduction

The global financial crisis has been the most severe economic event since the Great Depression, with many developed countries falling into deep recessions since its outset in 2007. Although it started off on the American continent, the tremors had a stronger impact in Europe, especially in the Mediterranean countries. As a result of this recession and in conjunction with local unrelenting spending, Greece has entered a prolonged and sustained economic downturn since early 2009.

The country's Gross Domestic Product (GDP) started displaying a negligible growth rate since the last months of 2007 and negative growth rate hereafter, until 2014, when it reached 0.8 % [1]. At the same time, the national debt rose from 105.4 % of GDP in 2007 to 175 % in 2013 and 177.1 % in 2014 [2]. To tackle the grim financial situation and to avoid a potential default that would further jeopardize the stability of the global economy, the international community and the Greek government agreed on two bailout programs (i.e., the so-called "Memorandum of Economic and Financial Policies") in 2010 and 2012. In return, the Greek government was required to implement a series of structural reforms and austerity measures under

✉ Marina Economou
antistigma@epipsi.eu

¹ University Mental Health Research Institute (UMHRI), Soranou toy Efesiou 2, Papagou, 11527 Athens, Greece

² First Department of Psychiatry, Medical School, National and Kapodistrian University, Athens, Greece

³ Faculty of Social and Political Sciences, University of Peloponnese, Corinth, Greece

⁴ Department of Hygiene, Epidemiology and Medical Statistics, Centre for Health Services Research, Medical School, National and Kapodistrian University, Athens, Greece

⁵ Department of Mental Health and Behavioral Sciences, School of Health Sciences, National and Kapodistrian University of Athens, Athens, Greece

the close supervision of the European Commission, the European Central Bank and the International Monetary Fund (collectively known as “Troika”); while it proceeded to substantial curtailing of public spending.

The enduring recession has been linked to a wide range of adverse social consequences. In accordance to data provided by the Hellenic Statistical Authority, the percentage of the population at risk of poverty or social exclusion rose from 28.1 % in 2008 to 35.7 % in 2013 and 36 % in 2014 [3]. Furthermore, a survey by the Hellenic Confederation of Professionals, Craftsmen and Merchants (GSEVEE) highlighted substantial income loss for 93.7 % of households since the outbreak of the crisis with ensuing reductions in expenses for basic goods and food [4]. In addition, one out of 3 households reported delaying payment of their debts, while 42.5 % of households were skeptical about the ability of their income to meet upcoming financial obligations. At the same time, the negative impact of the financial crisis on Greek households has also influenced the child population. According to data emanating from UNICEF, there has been a substantial increase in the child poverty rate from 23 % in 2008 to 40.5 % in 2012 [5]. Although poverty and income loss are dire repercussions of the recession, the steep rise in unemployment rates emerges as the most significant consequence of the Greek social landscape amid financial crisis.

As a corollary of the implemented measures that dismantled the labor market, the number of employed individuals was reduced by 20 % (i.e., 930,000 people) between 2010 and 2013. In particular, unemployment rates rose throughout the recession: 7.7 % in 2008, 9.5 % in 2009, 12.6 % in 2010, 17.7 % in 2011, 24.3 % in 2012 and 27.5 % in 2013 [6]. In 2015, 25.6 % of citizens were found to be unemployed, the highest figure recorded in the Eurozone [7]. At the same time, only a minority of unemployed individuals were receiving benefits for their working status. In a monthly report published by the Manpower Employment Organization (OAED) in April 2015, the number of registered unemployed individuals seeking work reached 840,216 people, with only 10.8 % (i.e., 104,888 people) of them being in receipt of benefits during this month [8]. It is, therefore, clear that unemployment and financial hardship are the defining features of the ongoing financial crisis in Greece and thus a number of studies have concentrated on exploring their influence on health.

Reviews on the health effects of the financial crisis in Greece have suggested a gradual deterioration of public health [9, 10]. In a single-country analysis and by employing a difference-to-difference approach, VANDOROS and colleagues [11] have provided empirical evidence that the financial crisis in Greece has impinged on

self-rated health trends in the country; a finding which has been replicated even when a control population was incorporated in the study design [12]. Apart from self-reported indicators, it has been reported that the time period 2009–2011, Greece experienced unevenly high morbidity and mortality burden of various large-scale epidemics, including an outbreak of West Nile Virus infections (WNV), malaria and a major outbreak of HIV among injection drug users [13]. The negative effects of the HIV epidemic amid the recession has been confirmed by another study [14], which has nonetheless reported a moderate health effect of the financial crisis in Greece. In particular, between the time periods 2003–2007 and 2008–2012, it has documented deterioration in 5 out of 30 health indicators solely: HIV incidence, maternal mortality, ill-defined conditions, infant mortality and suicide.

The impact of the financial crisis on suicides has been a highly contentious issue in the country [15–20]. Recently, a 30-year interrupted time-series analysis of the impact of austerity- and prosperity-related events on suicide rates between 1983 and 2012 found a significant, abrupt and sustained rise in total suicides, i.e., by 35.7 % and male suicides, i.e., by 18.5 % after the passage of new austerity measures in June 2011 [21]. Similarly, another ecological study [22] investigating suicide rates between 2003 and 2012 found a substantial increase by 35 % between 2010 and 2012 for the total rate, by 29 % for men and by 32 % for women. Furthermore, unemployment was found to bear a significant correlation with suicide mortality, especially among working age men. In a similar vein, Antonakis and Collins [23] have found that the effects of fiscal austerity are gender and age specific. By exploring suicide rates between 1968 and 2011, they conclude that fiscal austerity adversely influences only the male population and those aged between 45 and 89 years. It is, therefore, clear that the sustained recession in Greece has resulted in a gradual decline of the health of the population, including its mental health.

In this frame, the University Mental Health Research Institute has designed and implemented a series of repeated nationwide cross-sectional studies in 2008, 2009 and 2011 [24]. These studies comprise the main epidemiological findings concerning the mental health effects of the financial crisis in Greece [24]. Specifically, a gradual but steady rise has been documented in one-month prevalence of major depression from 3.3 % in 2008 to 6.8 % in 2009 and 8.2 % in 2011 [25, 26]. Financial hardship was found to be significantly associated with major depression in all three surveys and more importantly to exert a moderator effect on the association between indices of social capital and major depression [27]. Furthermore, regarding suicidality, one-month prevalence of suicidal ideation was found to be

2.4 % in 2008, 5.2 % in 2009 and 6.7 % in 2011; while one-month prevalence of suicide attempt was found to be 0.6, 1.1 and 1.5 %, respectively [16, 28]. Congruent with these, in 2013 another study was conducted in an endeavor to investigate the impact of the enduring recession on the mental health of the population. In line with this, in the current report, the following objectives were explored and thus presented:

- to estimate one-month prevalence of major depression,
- to identify the socio-demographic risk factors for major depression,
- to estimate one-month prevalence of suicidality,
- to identify the socio-demographic risk factors for suicidality.

Methods

Sample

The sampling frame of the study has been the national phone number databank, which provides coverage for the majority of household in the country. The particular directory entails only landline telephone numbers and thus mobile phone numbers are excluded. A stratified sampling procedure was employed taking into account the following three variables: (1) geographic region, (2) gender and (3) age. Phone numbers belonging to businesses were excluded on statistical and ethical grounds (e.g., employees display uneven odds for being selected in the final sample, through both their residential phone number as well as the business phone number). Within each household, the person who had their birthday last was selected for the interview, provided their age was within the 18–79 age range. At least 5 call backs were allowed and to be included into the sample, participants had to be fluent Greek speakers.

In total, out of the 2700 people contacted, 2,188 completed successfully the interview (response rate = 81 %). Among the remaining 512 people, 144 hung up immediately (11.1 %), 299 refused to take part (10.3 %) and 69 did not manage to complete the interview (2.6 %). Between participants who participated and those who did not, no statistically significant difference was recorded in terms of geographic region. Furthermore, no statistically significant differences were observed in terms of gender nor age between respondents and those who refused to take part/did not complete the survey.

The sample was weighted with regards to gender age and geographic region in accord with the 2001 population census. As in previous studies, the maximum sampling error was ± 2.06 .

Instrument

As in previous studies, the presence of major depression was assessed with the relevant module of the Structured Clinical Interview (SCID) [29]. To be classified as “depressed”, a respondent had to manifest at least one of the two core symptoms of major depression as well as 5 symptoms overall (at least 5 out of the 2 core symptoms and the 7 additional ones) most of the time for at least 2 weeks in the previous month. Furthermore, the presence of these symptoms should have impeded his/her functioning at work/university, home or in interpersonal relations and could not have been accounted for by a physical illness, the influence of medication, the use of substance or bereavement. The SCID-I has been standardized in the Greek population and has been extensively used in clinical and epidemiological studies [30]. Suicidality was assessed with two questions enquiring about suicidal thoughts and suicidal attempt during the previous month. Participants who responded affirmatively in at least one of these two questions, scored positive in the suicidality variable.

Participants’ degree of financial hardship was measured by the Index of Personal Economic Distress (IPED), which has been extensively described elsewhere [25]. In short, the index taps participants’ difficulty in meeting ordinary financial demands during the previous 6 months, such as paying electricity bills, the rent, the super market, etc. In the 2013 survey, on the 8-item index, another item was added, as the enduring nature of the financial crisis has surfaced different sources of financial strain for a household and, therefore, has necessitated a revision of the measure. Consistent with this, participants’ difficulty in paying taxes and health/pension contributions to the social security funds has been taken into consideration in the revised scale. Therefore, the Index encompassed 9 items, rated on a three-point scale reflecting the frequency with/by which participants find it difficult to fulfill their obligations (1 = never, 2 = sometimes and 3 = often). Higher scores indicate higher levels of financial hardship. The internal consistency of the scale was deemed good (Cronbach $\alpha = 0.72$). Information on participants’ socio-demographic characteristics (urban vs rural area of residence, gender, age, family status, employment status and educational attainment) was also gleaned.

Data were collected during the time period February–April 2013.

Procedure

After an oral informed consent was attained from participants, the interview was initiated. The interview questions were stored centrally, recalled in programmable sequences and displayed for each of the 20 interviewers’ computer

terminal (Computer-Assisted Telephone Interviewing method). Each interviewer entered the answers received directly in his/her computer. This method allows greater accuracy and efficiency during data collection.

All interviews were conducted by well-trained interviewers who were predominantly graduates of social sciences. The training was similar to the one delivered in the previous surveys. Data were collected the time period February to April 2013 and the study had previously received approval from the University Mental Health Research Institute Ethics Committee, in accordance with the ethical standards delineated in the 1964 Declaration of Helsinki.

Statistical analysis

Continuous variables are presented with mean and standard deviation (SD) or with median and interquartile range (IQR). Qualitative variables are presented with absolute and relative frequencies. The association between financial hardship (measured via IPED) and MDE or suicidality was explored first using univariate logistic regression analysis. Afterwards, multivariate logistic regression analysis was conducted adjusting for sex, age, place of residence, family status, education and employment status. Suicidality adjustment for the presence of MDE was also done in the multivariate model. Unadjusted and adjusted odds ratios (OR) with 95 % confidence intervals (95 % CI) were computed from the results of the logistic regression analyses. Hypothesized interactions of variables in the models were not significant. All reported *p* values are two tailed. Statistical significance was set at $P < 0.05$ and analyses were conducted using SPSS statistical software (version 19.0).

Results

Sample characteristics

Sample characteristics are presented in Table 1. Almost half of them were males (49.5 %). In addition, 35.4 % of the participants were between 35 and 54 years, 33.2 % were between 18 and 34 years and the remaining 31.4 % were between 55 and 80 years. Most participants were married with the percentage being equal to 62.9 %. More than half of the participants (59.9 %) had more than 12 years of education. In addition, 73.6 % of the participants lived in an urban centre. Regarding employment status, 12.8 % of the samples were unemployed and 42.6 % were economically inactive. Mean IPED score was found to be 7.5 (SD = 3.9).

Table 1 Sample characteristics

	<i>N</i> (%)
Sex	
Males	1082 (49.5)
Females	1106 (50.5)
Age	
18–34	726 (33.2)
35–54	775 (35.4)
55–80	687 (31.4)
Place of residence	
Urban	1610 (73.6)
Rural	578 (26.4)
Family status	
Single	670 (30.7)
Married	1306 (59.9)
Divorced/widow/widower	204 (9.4)
Years of education	
≤9	425 (19.6)
10–12	684 (31.5)
>12	1064 (49.0)
Employment status	
Economically active population	969 (44.6)
Unemployed	278 (12.8)
Economically inactive population	925 (42.6)
IPED score, mean (SD)	7.5 (3.9)
MDE	
No	1918 (87.7)
Yes	270 (12.3)
Suicidality	
No	2126 (97.2)
Yes	61 (2.8)

Prevalence of major depression and suicidality

The prevalence of depression for the total sample was 12.3 % (95 % CI 11.0–14.1 %), while the proportion of participants who displayed suicidality was 2.8 % (95 % CI 2.1–3.5 %). The particular results can be also found in Table 1.

Risk factors for major depression

Table 2 presents results from univariate and multivariate logistic regression analyses for major depression. Multivariate analysis showed a significant effect of IPED on depression. For one unit increase in the IPED score the odds of MDE increased about 19 %. Additionally, economically active and economically inactive population had 58 and 53 % lower likelihood for major depression, as

Table 2 Results from univariate and multivariate logistic regression analyses with dependent variable the presence of MDE

	% MDE	Unadjusted OR (95 % CI) ^a	<i>P</i>	Adjusted OR (95 % CI) ^a	<i>P</i>
Sex					
Males	9.0	1.00 ^b		1.00 ^b	
Females	15.6	1.88 (1.45–2.45)	<0.001	1.80 (1.33–2.43)	<0.001
Age					
18–34	9.2	1.00		1.00	
35–54	14.5	1.66 (1.2–2.29)	0.002	1.08 (0.71–1.64)	0.711
55–80	13.2	1.5 (1.07–2.10)	0.017	1.28 (0.77–2.13)	0.340
Place of residence					
Urban	11.0	1.00		1.00	
Rural	16.1	1.55 (1.18–2.04)	0.001	1.51 (1.12–2.04)	0.007
Family status					
Single	7.2	1.00		1.00	
Married	14.5	2.21 (1.58–3.07)	<0.001	1.21 (0.78–1.87)	0.400
Divorced/widow/widower	14.7	2.23 (1.37–3.63)	0.001	1.24 (0.67–2.28)	0.492
Years of education					
≤9	20.9	1.00		1.00	
10–12	13.7	0.60 (0.44–0.83)	0.002	0.70 (0.48–1.01)	0.054
>12	7.7	0.32 (0.23–0.44)	<0.001	0.40 (0.27–0.59)	<0.001
Employment status					
Unemployed	9.8	1.00		1.00	
Economically active population	19.8	0.44 (0.31–0.63)	<0.001	0.42 (0.28–0.63)	<0.001
Economically inactive population	12.5	0.58 (0.41–0.83)	0.003	0.47 (0.30–0.73)	0.001
IPED score		1.19 (1.16–1.23)	<0.001	1.19 (1.15–1.23)	<0.001

^a Odds ratio (95 % confidence interval)

^b Indicates reference category

compared to unemployed population in multivariate analysis.

In addition, it was found that women and residents of rural areas displayed greater odds for having major depression. Furthermore, participants with more than 12 educational years had lower odds for major depression as compared with those having 9 or less educational years.

Risk factors for suicidality

Unadjusted and adjusted odds ratios for suicidality are shown in Table 3. IPED score had a significant effect on suicidality in both univariate and multivariate analysis. For one unit increase in the IPED score the odds of suicidality increases about 14 %. In addition, economically active and economically inactive population had 60 and 67 % lower likelihood for suicidality compared to unemployed population. Multivariate analysis also showed that participants with more than 12 educational years had lower odds for suicidality in comparison with those having 9 or less educational years and that subjects aged 35 to 54 years had 2.35 greater likelihood for suicidality compared to those aged less than 35 years. Furthermore, as expected the

presence of MDE showed a strong association with the presence of suicidality. Interestingly, when all variables are entered into the multivariate model, one can observe that the strength of association between unemployment and financial hardship on the one hand and suicidality on the other is reduced, perhaps due to the influence of one another as well as the inclusion of major depression in the model. Interestingly, even in the multivariate model they continue to exert a substantial and independent effect on suicidality.

Discussion

The findings of the study indicate that 1-month prevalence of major depression continues to be on the rise. In particular, prior to the outset of the crisis the prevalence of major depression was as low as 3.3 %; however, since then a gradual but steady upward course is documented: 6.8 % in 2009, 8.2 % in 2011 and 12.3 % in 2013 [25, 26]. This finding makes major depression one of the largest public health concerns in Greece amid the economic downturn and it is consistent with a short report suggesting an

Table 3 Results from univariate and multivariate logistic regression analyses with dependent variable the presence of suicidality

	% suicidality	Unadjusted OR (95 % CI) ^a	<i>P</i>	Adjusted OR (95 % CI) ^a	<i>P</i>
Sex					
Males	2.2	1.00 ^b		1.00 ^b	
Females	3.3	1.53 (0.91–2.57)	0.111	1.2 (0.65–2.22)	0.561
Age					
18–34	1.7	1.00 ^b		1.00 ^b	
35–54	4.1	2.56 (1.31–5.01)	0.006	2.35 (1.01–5.49)	0.048
55–80	2.5	1.51 (0.71–3.18)	0.281	1.50 (0.51–4.46)	0.463
Place of residence					
Urban	2.9	1.00 ^b		1.00 ^b	
Rural	2.6	0.91 (0.5–1.63)	0.741	0.70 (0.36–1.35)	0.288
Family status					
Single	2.1	1.00 ^b		1.00 ^b	
Married	2.8	1.36 (0.73–2.54)	0.328	0.59 (0.25–1.35)	0.209
Divorced/widow/widower	4.9	2.41 (1.05–5.51)	0.037	1.23 (0.41–3.67)	0.712
Years of education					
≤9	5.9	1.00 ^b		1.00 ^b	
10–12	2.9	0.48 (0.26–0.88)	0.018	0.58 (0.28–1.18)	0.132
>12	1.5	0.24 (0.13–0.46)	<0.001	0.35 (0.16–0.76)	0.008
Employment status					
Unemployed	2.0	1.00 ^b		1.00 ^b	
Economically active population	7.2	0.26 (0.14–0.49)	<0.001	0.40 (0.19–0.83)	0.013
Economically inactive population	2.3	0.30 (0.16–0.56)	<0.001	0.33 (0.14–0.77)	0.010
IPED score	2.2	1.16 (1.09–1.22)	<0.001	1.14 (1.08–1.22)	<0.001
MDE					
No	1.0	1.00 ^b		1.00 ^b	
Yes	15.6	18.4 (10.52–32.18)	<0.001	11.81 (6.36–21.94)	<0.001

^a Odds ratio (95 % confidence interval)

^b Indicates reference category

increase in self-reported depressive symptoms between 2006 and 2011 [31]. Furthermore, the impact of financial crises on the prevalence of major depression has been documented in Hong Kong [32], Canada [33] and Spain [34]. On the contrary, one-month prevalence of suicidality displays a downward pattern throughout the recession in Greece. Previous reports of our research group recorded a rise in suicidal ideation from 2.4 % in 2008 to 5.2 % in 2009 and 6.7 % in 2011; while corresponding figures for suicide attempt were 0.6, 1.1 and 1.5 %, respectively [25, 28]. Data from these studies are in agreement with recent reports of a rise in suicide rates since the beginning of 2011 [21, 22]. Nonetheless, evidence from the current study indicates a return of the prevalence of suicidality (i.e., 2.8 %) to its pre-crisis levels. This is in line with evidence suggesting that while depression is likely to involve a prolonged course of symptoms prior to reaching a clinical diagnosis; suicide acts may reflect an acute response to the economic crisis [35]. It is noteworthy that South Korea

witnessed a surge in suicides in 1998, as a result of the recession; however, rates dropped hereafter [36].

With regard to predictors of major depression, multivariate analysis identified five risk factors: female gender, residence in rural areas, low educational attainment, unemployment and financial hardship. Interestingly, low educational attainment, unemployment and financial hardship were found to yield an independent and substantial effect on suicidality—even after controlling for the presence of major depression—substantiating further the impact of these socio-economic indicators on mental ill health. The elevated rates of major depression among women is among the most consistent finding in the epidemiology of major depression worldwide [37]; although the factors underlying these gender differences are far from clear [38] and beyond the scope of the particular report.

The finding that the majority of individuals suffering from major depression resides in rural areas, as compared to urban areas, is contrary to expectations, as international

evidence indicates that living in rural areas is linked to lower prevalence of major depression (for a meta-analysis, see [39]). Furthermore, since the beginning of the crisis living in rural areas in Greece was deemed a better choice, as unemployment rates were lower (e.g., 22 vs 29 % in 2013 [40] and quality of life was higher [41]). Therefore, it is surprising that in year 2013, residents of rural areas showed heightened risk of major depression as compared to residents in urban areas. A possible explanation may be a potential time lag between the onset of the crisis and its adverse consequences. The crisis started off in the urban centres, where unemployment rates rose sharply, while at the same time life in rural areas was more stable, secure and self-contained. This is in line with evidence supporting that there was at least a year delay for the economic crisis to influence agricultural economy [41]. However, the prolonged duration of the recession resulted in its spreading to all parts of the country permeating every facet of daily life. Alternatively, the higher prevalence of major depression in rural areas can be explained by the dismantling of health services in the country, especially after 2011 [10, 42], and the various access constraints documented amid the recession [43], making even harder for people in rural areas to access services and to have appropriate treatment for either physical or mental health complaints. In addition, the last years of the crisis, a migration shift from urban centres to rural areas has been observed [41]. As a corollary of this, it is highly likely that people previously residing in urban areas face difficulty in adjusting to the new lifestyle surrounding rural regions and, therefore, they influence the prevalence of depression in these areas.

Low educational status, unemployment and economic hardship constitute fundamental socio-economic determinants of health and, therefore, it is not surprising that they exert a noteworthy and independent effect on major depression in the multivariate analysis. After all, high rates in unemployment and economic hardship have become the defining features of the sustained recession in Greece. These findings underline the contribution of socio-economic stresses to the manifestation of major depression; without of course overlooking the genetic component in the etiopathogenesis of the disorder [44].

Findings pertaining to the harmful influence of low educational status on major depression are similar to the ones reported by Hessel and colleagues [12] with respect to health. In particular, Greeks with only secondary or less education experienced a marked health decline as compared to the control population incorporated in the study design. This pattern of results is congruent with evidence showing that the impact of recessions on the labor market is borne disproportionately by different population subgroups, with people who are less educated being more likely to lose their job or face greater job uncertainty [45].

With regard to unemployment, converging evidence corroborates its link to major depression and suicidality in times of prosperity [46, 47] and recession [33, 34, 48]. In Greece, unemployment has been found to have an association with suicides [20, 22], self-reported ill health [49] and clinically significant depressive symptomatology [50]. Interestingly, in the previous survey conducted by our research group, unemployment was not found to be a risk factor of major depression [25, 26]. A possible explanation for this is that unemployment rates rocketed after 2011, with pertinent rates being 9.5 % in 2009, 12.6 % in 2010, 17.7 % in 2011, 24.3 % in 2012 and 27.5 % in 2013 [6]. At the same time, it started becoming clear that unemployment would be predominantly of long duration. It is noteworthy that in accord to a release by the Manpower Employment Organization (OAED), in May 2013 the total number of registered unemployed individuals who were seeking employment was 876.364 [51]. Among them, 376.916 people (i.e., 43 %) were seeking for employment for more than a year.

On the contrary, the association between economic hardship and major depression/suicidality has been a consistent finding in all four surveys conducted by our research group, confirming the importance of the particular socio-economic indicator in both periods of prosperity and recession. In a cross-sectional survey conducted in England in 2007, indebtedness emerged as a key correlate of common mental disorders, including major depression [52] as well as of suicidal ideation [53]. Interestingly, a recent publication based on data from the Swedish National Public Health Survey showed that self-reported financial difficulties were substantially associated with mental health problems (depression and anxiety symptoms) in a graded manner, while income was unrelated [54]. This association has important implications for Greece, where evidence indicates that a substantial proportion of the population delays payment of its debts [4] and is at risk of poverty or social exclusion [3].

Finally, with respect to the predictors of suicidality, it is not surprising that major depression was found to constitute the strongest risk factor of the multivariate model, in line with compelling evidence verifying the link between the two mental health outcomes [55, 56]. Nonetheless, an important finding of the study is that the association between economic hardship and suicidality as well as between unemployment and suicidality is only partly attributed to the mediating–confounding effect of major depression, as both socio-economic variables retain their effect even in the multivariate model. Congruent with this, amid financial crisis there are suicidality symptoms related to the presence of major depression; however, there are suicidality symptoms which are independent of major depression and are driven by socio-economic determinants.

This is in line with evidence from the UK, suggesting that in 2010 and 2011 financial and employment-related issues contributed substantially to 13 % of deaths and were considered to be the key contributing factor in 4 % [57]. Researchers of the particular study describe these suicides as recession-related deaths. A potential mediating pathway in the association between unemployment/financial hardship and suicidality is through the construct of hopelessness; a hypothesis which will be tested in an ensuing survey by our research group. It is noteworthy that hopelessness has been shown to mediate the relationship between depression and suicidal behavior; while it also has an independent effect on suicidal ideation [58].

Therefore, the sustained recession in Greece necessitates social protection responses for mitigating the mental health effects of the crisis. Restructuring of mental health services for treating existing psychiatric morbidity as well as active labor market programs and debt relief programs should be implemented simultaneously; while enhancing the social capital of the population [59]. Tailored interventions should be geared towards high-risk population groups: women, people living in rural areas, unemployed individuals and people experiencing financial strain. Moreover, any intervention undertaken should be multifaceted, evidence based, cost effective and culture specific [60].

Limitations

The present study is the fourth one in a series of repeated cross-sectional surveys. In spite of the similar methodology employed in all four surveys, the study is not a cohort study and, therefore, the increasing number of Greek people meeting the criteria of major depression may not be “new cases” of the disorder (i.e., incidence of major depression), but a mixture of new cases, older cases who have relapsed and/or chronic cases. In a similar vein, variables other than the existing economic crisis may have influenced the observed upward course—these may be methodological in nature (e.g., throughout the years we may have experienced shifts in the population composition due to immigration) or psycho-social (e.g., less stigma attached to the disorder, making people more open to disclose this type of information). Furthermore, cross-sectional surveys cannot shed light on the temporal sequence of events, raising concerns about the direction of causality between the socio-economic determinants and major depression/suicidality.

Another limitation of the study pertains to its sampling strategy and the telephone mode of data collection. The telephone mode was preferred to face-to-face due to the benefits conferred in terms of time and cost, especially in the context of repeated studies. In addition, in all four of our studies the response rate was found to be around 80 %, which is substantially higher than the corresponding (i.e., 54 %) reported by the household psychiatric morbidity survey conducted in Greece in 2009–2010 [61]. Concerning the sampling frame, it included only landline numbers, as the majority of households in Greece have a fixed telephone access [62] and the inclusion of mobile phone numbers would have made random selection of participants difficult to achieve. Furthermore, the present survey had to follow the same methodology employed in the previous surveys and, therefore, a change in the sampling frame of the study would have made the current data difficult to compare with the previous ones. Nonetheless, the sampling frame and the data collection of the study raise concern about particular population subgroups that may have been omitted (e.g., homeless or living in extreme poverty) or been under-represented (e.g., immigrants). As these population subgroups are susceptible to developing major depression and suicidality, sampling bias may have emerged in the study design.

reported by the household psychiatric morbidity survey conducted in Greece in 2009–2010 [61]. Concerning the sampling frame, it included only landline numbers, as the majority of households in Greece have a fixed telephone access [62] and the inclusion of mobile phone numbers would have made random selection of participants difficult to achieve. Furthermore, the present survey had to follow the same methodology employed in the previous surveys and, therefore, a change in the sampling frame of the study would have made the current data difficult to compare with the previous ones. Nonetheless, the sampling frame and the data collection of the study raise concern about particular population subgroups that may have been omitted (e.g., homeless or living in extreme poverty) or been under-represented (e.g., immigrants). As these population subgroups are susceptible to developing major depression and suicidality, sampling bias may have emerged in the study design.

Conclusion

In conclusion, the sustained recession in Greece has incurred adverse effects on the mental health of the population. Rising rates of major depression as well as the prominent role played by unemployment and financial hardship in predicting both major depression and suicidality stress the imperative need for the implementation of social policies and interventions that would offset the grave impact of the downturn.

Compliance with ethical standards

Conflict of interest None to declare.

References

1. The World Bank (2015) GDP growth (% annual), 2015. <http://data.worldbank.org/indicator/NY.GDP.MKTP.KD.ZG>. Accessed 18 Aug 2015
2. Eurostat (2015) Eurostat statistics database 2015. <http://epp.eurostat.ec.europa.eu>. Accessed 18 Aug 2015
3. Hellenic Statistical Authority (2015) Press release: risk of poverty. Research on income and living conditions of households 2014. HAS, Piraeus
4. Hellenic Confederation of Professionals, Craftsmen and Merchants (2014) Research on household income and expenses. GSEEVE, Athens
5. United Nation's Children's Fund (2014) Children of the recession: the impact of the economic crisis on child well-being in rich countries. UNICEF, Florence
6. Eurostat (2013) Eurostat statistics database 2013. <http://epp.eurostat.ec.europa.eu>. Accessed 17 Aug 2015
7. Eurostat (2015) Euro area unemployment rate at 11.1 %. Eurostat, Luxembourg
8. Manpower Employment Organization (2015) Brief report: Registry of Manpower Employment Organization-April 2015. Manpower Employment Organization, Athens

9. Kentikelenis A, Karanikolos M, Reeves A et al (2014) Greece's health crisis: from austerity to denialism. *Lancet* 383:748–753
10. Simou E, Koutsogeorgou E (2014) Effects of the economic crisis on health and healthcare in Greece in the literature from 2009 to 2013: a systematic review. *Health Policy* 115:111–119
11. Vantoros S, Hessel P, Leone T et al (2013) Have health trends worsened in Greece as a result of the financial crisis? A quasi-experimental approach. *Eur J Public Health* 23:727–731
12. Hessel P, Vantoros S, Avendano M (2014) The differential impact of the financial crisis on health in Ireland and Greece: a quasi-experimental approach. *Public Health* 128:911–919
13. Bonovas S, Nikolopoulos G (2012) High-burden epidemics in Greece in the era of economic crisis. Early signs of a public health tragedy. *J Prev Med Hyg* 53:169–171
14. Tapia Granados JA, Rodriguez JM (2015) Health, economic crisis and austerity. A comparison of Greece, Finland and Iceland. *Health Policy* 119:941–953
15. Kentikelenis A, Karanikolos M, Papanicolas I et al (2011) Health effects of the financial crisis: omens of a Greek tragedy. *Lancet* 378:1457–1458
16. Economou M, Madianos M, Theleritis C et al (2011) Increased suicidality amid economic crisis in Greece. *Lancet* 378:1459
17. Stuckler D, Basu S, Suhrche M et al (2011) Effects of the 2008 recession on health: a first look at European data. *Lancet* 378:124–125
18. Fountoulakis KN, Grammatikopoulos IA, Koupidis S et al (2012) Health and the financial crisis in Greece. *Lancet* 379:1001–1002
19. Liaropoulos L (2012) Economic crisis and health in Greece, 2009–2012. *BMJ* 345:e7988
20. Madianos M, Alexiou T, Patelakis A et al (2014) Suicide, unemployment and other socioeconomic factors evidence from the economic crisis in Greece. *Eur J Psychiatry* 28:39–49
21. Branas CC, Kastanaki A, Michalodimitrakis M et al (2014) The impact of economic austerity and prosperity events on suicide in Greece: a 30-year interrupted time-series analysis. *BMJ Open* 5:e005619
22. Rachiotis G, Stuckler D, McKee M et al (2015) What has happened to suicides during the Greek economic crisis? Findings from an ecological study of suicides and their determinants (2003–2012). *BMJ Open* 5:e007295
23. Antonakakis N, Collins A (2014) The impact of fiscal austerity on suicide: on the empirics of a modern Greek tragedy. *Soc Sci Med* 112:39–50
24. Economou M, Peppou LE, Souliotis K (2016) Mental health repercussions of the economic disaster in Greece. In: Christodoulou G (ed) *Crises and disasters*. Cambridge Scholars Publishing, Cambridge (in press)
25. Madianos M, Economou M, Alexiou T et al (2011) Depression and economic hardship across Greece in 2008 and 2009: two cross-sectional surveys nationwide. *Soc Psychiatry Psychiatr Epidemiol* 46:943–952
26. Economou M, Madianos M, Peppou LE et al (2013) Major depression in the era of economic crisis: a replication of a cross-sectional study across Greece. *J Affect Disord* 145:308–314
27. Economou M, Madianos M, Le Peppou et al (2014) Cognitive social capital and mental illness during economic crisis: a nationwide population-based study in Greece. *Soc Sci Med* 100:141–147
28. Economou M, Madianos M, Peppou LE et al (2013) Suicidal ideation and reported suicide attempts in Greece during the economic crisis. *World Psychiatry* 12:53–59
29. First MB, Spitzer R, Gibbon M et al (1996) Structured clinical interview for DSM IV axis I disorders, patient edition. Biometric Research, New York State Psychiatric Institute, New York
30. Madianos M, Papaghelis M, Philippakis A (1997) The reliability of SCID-I in Greece in clinical and general population. *Psychiatriki* 8:101–108
31. Mylona K, Tsiantou V, Zavras D et al (2014) Determinants of self-reported frequency of depressive symptoms in Greece during economic crisis. *Public Health* 128:752–754
32. Lee S, Guo W, Tsang A et al (2010) Evidence for the 2008 economic crisis exacerbating depression in Hong Kong. *J Affect Disord* 126:125–133
33. Wang JL, Smailes E, Sareen J et al (2010) The prevalence of mental disorders in the working population over the period of global economic crisis. *Can J Psychiatry* 55:598–605
34. Gili M, Roca M, Basu S et al (2013) The mental health risks of economic crisis in Spain: evidence from primary care centres 2006 and 2010. *Eur J Public Health* 23:103–108
35. Hong J, Knapp M, McGuire A (2011) Income-related inequalities in the prevalence of depression and suicidal behaviour: a 10-year trend following economic crisis. *World Psychiatry* 10:40–44
36. Organization for Economic Cooperation and Development (2007) OECD health report. Organization for Economic Cooperation and Development, Paris
37. Hasin DS, Fenton MC, Weissman MM (2011) Epidemiology of depressive disorders. In: Tsuang MT, Tohen M, Jones P (eds) *Textbook in psychiatric epidemiology*. John Wiley & Sons, West Sussex
38. Piccinelli M, Wilkinson G (2008) Gender differences in depression: critical review. *Br J Psychiatry* 177:486–492
39. Peen J, Shoeners RA, Beekman AT et al (2010) The current status of urban-rural areas in psychiatric disorders. *Acta Psychiatr Scand* 121:84–93
40. Hellenic Statistical Authority (2013) Research on labor force 2013. HSA, Piraeus
41. Kasimis C, Zografakis S (2014) Crisis and return to agriculture. In: Zampourloukou S, Kousi M (eds) *Social aspects of the crisis in Greece*. Pedio, Athens
42. Economou C, Kaitelidou D, Kentikelenis A et al (2014) The impact of the financial crisis on the health system and health in Greece. WHO, Copenhagen
43. Souliotis K, Papageorgiou M, Politi A et al (2014) Barriers to accessing biologic treatment for rheumatoid arthritis in Greece: the unseen impact of the fiscal crisis—the Health Outcomes Patient Environment (HOPE) study. *Rheumatol Int* 34:25–33
44. McGuffin P, Rivera M (2015) The interaction between stress and genetic factors in the etiopathogenesis of depression. *World Psychiatry* 14:162–165
45. Hoynes HW, Miller DL, Schaller J (2012) Who suffers during recessions? NBER Work Pap 17951
46. Blakely TA, Collings SCD, Atkinson J (2003) Unemployment and suicide. Evidence for a causal association? *J Epidemiol Community Health* 57:594–600
47. Jefferis BJ, Nazareth I, Marston L et al (2011) Association between unemployment and major depressive disorder: evidence from an international, prospective study (the predict cohort). *Soc Sci Med* 73:1627–1634
48. Reeves A, McKee M, Stuckler D (2014) Economic suicides in the Great Recession in Europe and North America. *Br J Psychiatry* 205:246–247
49. Drydakis N (2015) The effect of unemployment on self-reported health and mental health in Greece from 2008 to 2013: a longitudinal study before and during the financial crisis. *Soc Sci Med* 128:43–51
50. Economou M, Peppou LE, Louki E et al (2012) Depression telephone helpline: help-seeking during the financial crisis. *Psychiatriki* 23:17–28
51. Manpower Employment Organization (2013) Brief report: Registry of Manpower Employment Organization-May 2013. Manpower Employment Organization, Athens
52. Meltzer H, Bebbington P, Brugha T et al (2011) Personal debt and suicidal ideation. *Psychol Med* 41:771–778

53. Melzter H, Bebbington P, Brugha T et al (2012) The relationship between personal debt and specific mental disorders. *Eur J Public Health* 23:108–113
54. Ahnquist J, Wamala SP (2011) Economic hardships in adulthood and mental health in Sweden: the Sweden National Public Health Survey 2009. *BMC Public Health* 11:788–798
55. Blair-West GW, Cantor CH, Mellsop GW et al (1999) Lifetime suicide risk in major depression: sex and age determinants. *J Affect Disord* 55:171–178
56. Malone KM, Haas GL, Sweeney JA et al (1995) Major depression and the risk of attempted suicide. *J Affect Disord* 34:173–185
57. Coope C, Donovan J, Wilson C et al (2015) Characteristics of people dying by suicide after job loss, financial difficulties and other economic stressors during a period of recession (2010–2011): a review of coroners' records. *J Affect Disord* 183:98–105
58. Beck A, Steer R, Beck J et al (1993) Hopelessness, depression suicidal ideation and clinical diagnosis of depression. *Suicide Life Threat Behav* 23:139–145
59. Wahlbeck K, McDaid D (2012) Actions to alleviate the mental health impact of the economic crisis. *World Psychiatry* 11:139–145
60. Christodoulou NG, Christodoulou GN (2013) Management of the psychosocial effects of economic crises. *World Psychiatry* 12:178
61. Skapinakis P, Bellos S, Koupidis S, Grammatikopoulos I, Theodorakis PN, Mavreas V (2013) Prevalence and sociodemographic associations of common mental disorders in a nationally representative sample of the general population. *BMC Psychiatry* 13:163–176
62. European Commission (2012). Special Eurobarometer 381: E-communications household survey report. http://ec.europa.eu/public_opinion/archives/ebs/ebs_381_en.pdf. Accessed 14 Dec 2015