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An association of economic hardship with depression and suicidality in times of recession in Greece

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ABSTRACT

The interplay between objective and subjective measures of economic hardship on influencing mental health has not been explored during a period of enduring recession. The present study aims to fill this gap by investigating the relationship between income and economic difficulties in evoking major depression and suicidality in Greece, while taking into consideration gender differences. A random and representative sample of 2188 adults participated in a telephone survey in 2013 (response rate = 81%). Major depression and suicidality were assessed with the pertinent modules of SCID-IV; while financial difficulties were measured by the Index of Personal Economic Distress. Information on confounder variables was also gleaned. Income exerted an independent effect on major depression (OR = 0.37, 95%CI = 0.22–0.63), which was more pronounced among men than women. On the contrary, financial difficulties exerted a strong and independent effect on depression (OR = 1.16, 95%CI = 1.13–1.2). Income was found to bear a strong association with suicidality only among men; whereas financial difficulties were unrelated in both genders. Subjective and objective indices of economic hardship exert a differential impact on mental health outcomes amid recession. Gender-sensitive policies and interventions should be geared towards softening the social effects of the recession in the country.

1. Introduction

Since 2009, Greece has experienced a long-lasting socio-economic crisis with dire implications on the health and mental health of the population. The socio-demographic and economic landscape has been characterized by sharp increases in unemployment rates, precarious work regimes, growing rates of poverty, a stark increase in the number of uninsured citizens, widened income inequalities and substantial income loss in the majority of households. Specifically, rates of unemployment rocketed from 7.8% in 2008 to 24.9% in 2015 and 23.1% in December 2016 (Eurostat, 2017). In a similar vein, the proportion of the population who is at risk of poverty or social exclusion rose from 28.1% in 2008 to 36% in 2014 and 35.7% in 2015 (Hellenic Statistical Authority, 2016). Furthermore, a survey by the Hellenic Confederation of Professionals,Craftsmen and Merchants (Hellenic Confederation of Professionals) recorded marked income loss for 93.7% of households since the outset of the crisis; whereas 75.3% of them reported additional reductions between 2015 and 2016. Roughly one out of three households was found to be in arrears, while roughly one in two respondents was pessimistic about the adequacy of their income to meet upcoming financial obligations. It merits noting that the documented increasing income inequality was in favour of the high income population layers (Hellenic Confederation of Professionals (2015).

From the outset of the recession, the National Health System (NHS) had already been in a state of crisis; however the financial crisis has brought it on the verge of collapse (Simou and Koutsogeorgou, 2014). Converging evidence substantiates a noteworthy increase in unmet health needs and important obstacles to care (Zavras et al., 2016). The Health Outcomes Patient Environment study on patients with rheumatoid arthritis demonstrated that one out of four respondents tackled barriers to accessing his/her doctor and one out of two to accessing his/her prescribed medication (Souliotis et al., 2013). In a similar vein, 31% of cancer patients reported difficulty in healthcare access and one out of four in medication access (Souliotis et al., 2015). Moreover, while in 2008 100% of citizens was covered by public health insurance, this figure dropped to 86% in 2015 (OECD, 2016). Inevitably, similar

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problems can be traced in the mental health care system. Existing mental health services have downsized their operations and personnel, while public funding for mental health has been reduced by 20% between 2010 and 2011 and by an additional 55% the time period 2011–2012 (Anagnostopoulos and Soumaki, 2013).Moreover, the percentage of compulsory admissions is also on the rise (i.e. 57.4%, Stylianidis et al., 2017). In this reasoning, the health care system, including its mental health branch, cannot adequately respond to the emerging needs of the population.

The impact of the financial crisis on suicide rates has engendered a lively debate in the country. Nonetheless, recent data by the Hellenic Statistical Authority corroborate a growing increase in total suicide rate by 35.7% as a corollary of new austerity measures in June 2011 (Branas et al. 2014). This finding concurs with Rachiotis et al. (2015) who demonstrated a 35% increase in total suicide rate the time period 2010–2012. In addition, evidence from the same study bolsters a significant correlation between suicide mortality and unemployment, especially among men of working age. A similar pattern of results is also observed with respect to suicidality and major depression.

The University Mental Health Research Institute (UMHRI) designed and implemented a series of repeated cross sectional surveys in 2008, 2009, 2011 and 2013, so as to monitor the mental health effects of the financial crisis in the country. Data were gleaned in the form of a telephone interview and the presence of major depression and suicidality were assessed with the pertinent modules of the Structured Clinical Interview. Evidence from this research initiative reveals a sizeable increase in one-month prevalence of major depression from 3.3% in 2008 to 6.8% in 2009, 8.2% in 2011 and 12.3% in 2013 (Economou et al., 2013a; Economou et al., 2016b). On the contrary, suicidality displayed an upward course until 2011: 2.4% in 2008, 5.2% in 2009 and 6.7% in 2011 and henceforth it returned to its pre-crisis levels: 2.8% in 2013 (Economou et al., 2013b; Economou et al., 2016b). A further exploration of the prevalence rates of major depression as a function of gender and age revealed that men of working age have become increasingly more vulnerable to manifesting the disorder amidst the recession, probably due to the omnipresence of unemployment (Economou et al., 2016a). This is in line with evidence indicating that unemployment and financial strain constituted important risk factors for both major depression and suidicality in 2013 (Economou et al., 2016b). Interestingly, the effect of unemployment and hardship on suicidality was retained, even after controlling for the effect of major depression. In this reasoning, suicidality cannot be explained solely by the presence of mental disorders and thus it may be attributed to social causes.

Building upon this work, and following the study of Jenkins and colleagues who showed that the effect of low income on mental disorder was attenuated after adjusting for debt, while it disappeared completely after controlling for other key socio-demographic variables (Jenkins et al., 2008), the present report aimed to investigate the mechanisms whereby objective and subjective dimensions of economic hardship influence mental health, after taking into account the moderating influence of gender (Antonakakis and Collins, 2014; Dagher, Chen & Thomas, 2015; Economou et al., 2016a). In particular, the following objectives were examined:

(i) the effect of individual income on major depression and suicidality, after adjusting for a confounding effect of financial difficulties as well as other confounders
(ii) the effect of financial difficulties on major depression and suicidality after adjusting for a confounding effect of individual income as well as other confounders.

To this end, it followed a similar methodology to the one delineated by Jenkins and colleagues (2009); however, it incorporated a separate analysis for men and women, in concordance with the research work by Ahnquist and Wamala (2011) and Ahnquist et al. (2007).

2. Methods

2.1. Study sample

The sampling frame of the study was the national phone-number databank, which provides coverage for the majority of households in the country. The particular directory entails only landline telephone numbers and therefore mobile phone numbers were excluded. A stratified sampling procedure was employed taking into consideration three variables: (i) geographic region, (ii) gender and (iii) age. Phone numbers belonging to businesses were excluded for statistical and ethical reasons (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 and they were fluent in Greek. At least 5 call backs were allowed.

In total, out of the 2700 people contacted, 2.188 successfully completed 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, there was no statistically significant difference in terms of geographic region. Furthermore, no statistically significant differences were recorded in terms of gender and age between respondents and those who refused to take part/did not complete the survey. The sample was weighted as regards gender, age and geographic region in accord with the last available population census (i.e. 2001 population census). As in previous studies, the maximum sampling error was +/− 2.06.

2.2. Instrument

2.2.1. Assessment of major depression and suicidality

The presence of major depression was assessed with the relevant module of the Structured Clinical Interview (SCID, First et al., 1996). 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 two 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 physical illness, use of medication or substance and bereavement. The SCID-I has been standardized in the Greek population and has been extensively used in clinical and epidemiological studies (Madianos et al., 1997). Suicidality was assessed with two questions enquiring about suicidal thoughts and suicidal attempt during the previous month. Specifically, the questions were phrased in the following way: “During the previous month, have you experienced recurrent thoughts about ending your life?” (suicidal ideation item) and “During the previous month, have you tried to end your life?” (suicidal attempt). Participants who responded affirmatively at least in one of these two questions, scored positive in the suicidality variable.

2.2.2. Dimensions of economic hardship

Individual income was divided into percentiles on the grounds of sample distribution: “0–600 €”, “601€ − 1000€”, “1001€ − 1500€” and “1501€ and higher”. The particular categorisation is in accordance to other epidemiological studies (Alegria et al., 2000; McMillan et al., 2010; Sareen et al., 2011) and it ensures adequate power per category, overcoming in this way the problems often pertaining to the skewed distribution of income in general population surveys.

Participants’ degree of financial difficulties was measured by the Index of Personal Economic Distress (IPED, Madianos et al., 2011). In particular, the index taps participants’ difficulty in meeting daily financial demands during the 6 months preceding the interview, such as

paying electricity bills, the rent, the super market, taxes and health/pension contributions. It entails 9 items, rated on a three-point scale reflecting a frequency dimension (1 = never, 2= sometimes and 3 = often). Higher composite scores indicate higher levels of financial distress. The internal consistency of the scale was deemed good (Cronbach a = 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 obtained.

2.3. Procedure

After an oral informed consent was attained from respondents, the interview was initiated. The interview questions were stored centrally, recalled in programmable sequences and displayed on each of the 20 interviewers' computer terminal (Computer Assisted Telephone Interviewing method). Each interviewer entered the answers he/she 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. 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.

2.4. Statistical analysis

Prevalence figures, along with 95% Confidence Intervals, for depression and suicidality were calculated for the whole sample. Moreover, prevalence rates were computed in each income category for men and women separately as well as for the total sample. With respect to exploring whether the effect of income and financial difficulties on major depression and suicidality is different by gender, two multiple logistic regression models were conducted: (1) included major depression as outcome variable and the following predictors: income, financial difficulties, sex and urbanicity, family status, employment and educational status along with two interaction terms (an interaction term between sex and income and an interaction term between sex and financial difficulties), (2) included suicidality as outcome variable and the following predictors: income, financial difficulties, sex, employment and educational status along with the two interaction terms above-described.

Wald statistic tests from the first model showed that the effect of income ($p = 0.041$) and financial difficulties ($p = 0.015$) was differentiated by gender. Regarding the second model, the effect of the interaction between income and gender yielded marginal statistical significance ($p = 0.057$); whereas the effect of the interaction between sex and financial difficulties was not significant ($p = 0.522$).

The analysis of the present study concurred with that of Jenkins and colleagues (2008). In this rationale, two sets of logistic regressions were performed. In the first set, crude odds ratios were computed for income and major depression (Model 1). The analysis was subsequently adjusted for financial difficulties alone and for other confounding variables: gender, age, family status, educational attainment, rural vs. urban area of residence and employment status (Model 2). In the second set, crude odds ratios were calculated for financial difficulties and major depression (Model 1). Subsequently the analysis was adjusted for income and other socio-demographic confounders (Model 2).

For the suicidality outcome variable, two models were computed in the two sets: one consisting of income and suicidality alone, one consisting of income and suicidality adjusted for financial difficulties, one entailing income and suicidality adjusted for financial difficulties and major depression and another one encompassing income and suicidality adjusted for financial difficulties, major depression and the other socio-economic confounders. Similarly, in the second set 2 models were computed: (i) financial difficulties and suicidality, (ii) financial difficulties and suicidality adjusted for income major depression and other confounders. Despite the fact that the interaction term between financial difficulties and gender was not statistically significant, a gender specific analysis is presented on the grounds of homogeneity of results; however, focus is given on the overall result in both genders.

Linear trend was computed by treating exposure as a continuous variable. Multicollinearity was assessed using variance inflation factor statistic tests (VIF). We considered VIF < 5 as an indication of reasonable independence among predictor variables. Moreover, Spearman's rank correlation test ($r_s > 0.5$) was performed to identify the collinearity between income and financial difficulties.

The analysis was conducted separately for men and women as well as for the total sample by using SPSS Version 19.0 and Stata Version 13.1.

3. Results

3.1. Sample characteristics

The majority of participants were women (50.5%) and belonged to the 35–54 years old age band (35.4%). Roughly three out of four respondents reported living in an urban area (73.6%) and one out of two had completed undergraduate/postgraduate studies (49%). Regarding participants' marital status, most of them were married (59.9%). In terms of their employment status, the vast majority were employed (44.6%) or economically inactive (42.6%). Sample characteristics with corresponding weighted frequencies can be found in eTable 1 (online supplementary material).

Table 1 depicts weighted overall prevalence rates of major depression and suicidality. Table 2 demonstrates the prevalence of these conditions per individual income category for the total sample as well as for men and women separately. Overall, low levels of income were found to be associated with heightened rates of both major depression and suicidality. Interestingly, more men than women were found to meet criteria for suicidality in the lowest and the highest income category.

3.2. Income, financial difficulties and major depression

As shown in Table 3, the effect of income on major depression was found to be largely explained by the influence of financial difficulties and other key socio-demographic variables for the total sample. Nonetheless, even after adjusting for these variables, a protective effect

Table 1
Prevalence of major depression and suicidality in total sample.

	Major depression		Suicidality	
	N	% (95% CI)	*N*	% (95% CI)
Total sample (*N* = 2188)	270	12.3% (11.0% – 13.8%)	61	2.8% (2.2% – 3.6%)
Gender				
Men (*N* = 1082)	97	9.0% (7.4% – 10.8%)	24	2.2% (1.5% – 3.3%)
Women (*N* = 1106)	173	15.6% (13.6% – 17.9%)	37	3.3% (2.4% – 4.6%)

CI: Confidence Intervals.

Table 2
Prevalence of major depression and suicidality by income category for the total sample, men and women.

	Major depression						Suicidality					
	Total		Men		Women		Total		Men		Women	
	N	% (95% CI)	*N*	% (95% CI)	*N*	% (95% CI)	*N*	% (95% CI)	*N*	% (95% CI)	*N*	% (95% CI)
Income												
0–600€	70	22.1% (17.9–27.1%)	27	19.3% (13.5–26.7%)	43	24.4% (18.6–31.3%)	23	7.3% (4.9% – 10.7%)	11	7.9% (4.4% – 13.7%)	12	6.8% (3.9% – 11.6%)
601–1000€	79	15% (12.2–18.3%)	31	12.4% (8.9% – 17.2%)	48	17.3% (13.2%-22.2)	19	3.6% (2.3% – 5.6%)	6	2.4% (1.1% – 5.3%)	13	4.7% (2.7% – 7.9%)
1001–1500€	54	11.9% (9.2% – 15.2%)	18	6.9% (4.4% – 10.8%)	36	18.4% (13.5–24.4%)	8	1.8% (0.9% – 3.5%)	3	1.2% (0.4% – 3.5%)	5	2.5% (1.1% – 6.0%)
1501€ and above	28	5.4% (3.7% – 7.7%)	7	2.7% (1.3% – 5.6%)	21	8% (5.3% – 12.0%)	6	1.2% (0.5% – 2.6%)	3	1.2% (0.4% – 3.6%)	3	1.1% (0.4% – 3.5%)

CI: 95% Confidence Interval.

of the highest income category (i.e. 1501 € and above) was observed (OR = 0.37, 95%CI = 0.22–0.63, *p*-trend < 0.01).

Income and financial difficulties were found to be poorly correlated ($r_s = -0.192$, $p < 0.001$). Since $r_s < 0.5$ no collinearity can be assumed. Regarding each gender separately, income was found to bear an independent association with major depression in men: respondents whose monthly income was higher than 1001€ displayed decreased odds of suffering from major depression as compared to respondents with low income. In women only the higher income category was found to have a significant protective effect against major depression, even after adjusting for financial difficulties and other key socio-demographic variables.

Table 3
Associations between income and major depression (unadjusted and adjusted for financial difficulties and other confounders) and between financial difficulties and major depression (unadjusted and adjusted for financial difficulties and other confounders.

	Model 1 Crude OR (95%CI)	Model 2 Adjusted OR (95%CI)
Total sample		
Income categories[1]	1.00	1.00
0–600 €	0.62 (0.43–0.89)**	0.74 (0.5–1.08)NS
601–1000 €	0.47 (0.32–0.7)**	0.66 (0.43–1.01)NS
1001–1500 €	0.2 (0.13–0.32)**	0.37 (0.22–0.63)**
1501 € and higher		
Men		
Income categories[2]	1.00	1.00
0–600 €	0.6 (0.34–1.05)NS	0.69 (0.37–1.29)NS
601–1000 €	0.31 (0.17–0.59)**	0.38 (0.19–0.76)**
1001–1500 €	0.12 (0.05–0.28)**	0.19 (0.07–0.5)**
1501 € and higher		
Women		
Income categories[3]	1.00	1.00
0–600 €	0.65 (0.41–1.03)NS	0.8 (0.49–1.3)NS
601–1000 €	0.7 (0.42–1.15)NS	1.03 (0.6–1.78)NS
1001–1500 €	0.27(0.15–0.47)**	0.52 (0.27–0.98)*
1501 € and higher		

	Model 3 Crude OR (95%CI)	Model 4 Adjusted OR (95%CI)
Total Sample		
Financial difficulties	1.18 (1.14–1.21)*	1.16 (1.13–1.2)*
Men		
Financial Difficulties	1.23 (1.17–1.28)*	1.23 (1.16–1.3)*
Women		
Financial difficulties	1.14 (1.1–1.18)*	1.12 (1.08–1.17)*

OR: odds ratio, 95% CI: confidence intervals, VIF: variance inflation factor,.
Model 1: income and major depression association.
Model 2: income and major depression association, adjusted for financial difficulties, urbanicity, family status, education and employment status.
Model 3: financial difficulties and major depression association.
Model 4: financial difficulties and major depression association, adjusted for income, urbanicity, family status, education and employment status.
Model 2 and Model 4: VIF Total sample 1.66; VIF Men 1.68; VIF Women 1.70.
* statistically significant association at $p < 0.05$,.
** statistically significant association at $p < 0.01$,.
NS statistically non-significant association.
[1] Test for linear trend was statistically significant in Model 1 ($p < 0.001$) and Model 2 ($p = 0.005$).
[2] Test for linear trend was statistically significant in Model 1 ($p < 0.001$) and Model 2 ($p = 0.003$).
[3] Test for linear trend was statistically significant in Model 1 ($p < 0.001$) but not in Model 2 ($p = 0.210$).

Table 4
Associations between income and suicidality (unadjusted and adjusted for financial difficulties and other confounders) and between financial difficulties and suicidality (unadjusted and adjusted for financial difficulties and other confounders.

	Model 1 Crude OR (95%CI)	Model 2 Adjusted OR (95%CI)
Total sample		
Income categories[1]	1.00	1.00
0–600 €	0.48 (0.26–0.89)*	0.62 (0.31–1.22)[NS]
601–1000 €	0.23 (0.1–0.52)**	0.36 (0.15–0.86)*
1001–1500 €	0.15 (0.06–0.37)**	0.34 (0.12–1.02)[NS]
1501 € and higher		
Men		
Income categories[2]	1.00	1.00
0–600 €	0.29 (0.11–0.8)*	0.35 (0.11–0.95)*
601–1000 €	0.14 (0.04–0.5)**	0.22 (0.05–0.91)*
1001–1500 €	0.14 (0.04–0.51)**	0.19 (0.03–0.78)*
1501 € and higher		
Women		
Income categories[3]	1.00	1.00
0–600 €	0.67 (0.3–1.51)[NS]	0.85 (0.35–2.08)[NS]
601–1000 €	0.36 (0.12–1.04)[NS]	0.51 (0.16–1.59)[NS]
1001–1500 €	0.16 (0.04–0.57)**	0.41 (0.1–1.71)[NS]
1501 € and higher		

	Model 3 Crude OR (95%CI)	Model 4 Adjusted OR (95%CI)
Total sample		
Financial difficulties	1.14 (1.08–1.2)**	1.07 (1–1.14)[NS]
Men		
Financial difficulties	1.17 (1.08–1.27)**	1.07 (0.97–1.18)[NS]
Women		
Financial difficulties	1.11 (1.04–1.19)**	1.05 (0.97–1.15)[NS]

OR: odds ratio, 95% CI : confidence intervals, VIF: variance inflation factor,.
Model 1: income and suicidality association.
Model 2: income and suicidality association, adjusted for financial difficulties major depression, education and employment status.
Model 3: financial difficulties and suicidality association.
Model 4: financial difficulties and suicidality association, adjusted for income, major depression, education and employment status.
Model 2 and Model 4: VIF Total sample 1.74; VIF Men 1.82; VIF Women 1.72.
* statistically significant association at $p < 0.05$.
** statistically significant association at $p < 0.01$.
[NS] statistically non-significant association.
[1] Test for linear trend was statistically significant in Model 1 ($p < 0.001$) but not in Model 2 ($p = 0.090$).
[2] Test for linear trend was statistically significant in Model 1 ($p < 0.001$) and in Model 2 ($p = 0.043$).
[3] Test for linear trend was statistically significant in Model 1 ($p < 0.001$) but not in Model 2 ($p = 0.392$).

Contrary to the pattern of results observed with respect to income, financial difficulties were found to exert a strong significant effect on major depression, even after controlling for the influence of income and other socio-demographic variables. This finding was documented for the sample as a whole as well as for men and women separately (Table 3).

3.3. Income, financial difficulties and suicidality

Concerning the effect of income on suicidality, a different pattern of results was recorded for men and women, influencing thus the findings for the overall sample (Table 4). In men, income was found to exert a substantial effect on the prevalence of suicidality, which was largely retained even after controlling for financial difficulties, the presence of major depression and key socio-demographic variables. On the other hand, in women income was not found to yield a substantial influence on suicidality even in the context of univariate analysis-apart from the highest income category. Nonetheless, this effect was eliminated after controlling for financial difficulties and the presence of major depression.

Taken together, the effect of income on suicidality for the overall sample was accounted by financial difficulties and other confounders; however, it did exert an independent influence, with respondents with income higher than 1000 € displaying decreased odds of manifesting suicidality as compared to respondents who belonged to lower income bands.

Interestingly, with respect to the effect of financial difficulties on suicidality, its influence remained largely unchanged when income and major depression were controlled for; however, the inclusion of other key socio-demographic variables in the model resulted in elimination of its effect. This pattern of findings was observed for the sample as a whole as well as for the two genders separately (Table 4).

The multicollinearity tests among independent variables indicated that there was no multicollinearity within the regression models (VIF < 5) (Tables 3 and 4).

4. Discussion

The particular study investigated the effect of objective (i.e. income) and subjective (i.e. self-reported financial difficulties) aspects of economic hardship on mental health outcomes (i.e. major depression and suicidality) amid recession. To this end, a separate analysis was conducted for men and women. The main findings of this survey were the following: (i) the association between income and major depression was

Table 5
Associations between financial difficulties and suicidality: unadjusted, adjusted for income and adjusted for financial difficulties and other confounders.

	Model 1 Crude OR (95%CI)	Model 2 Adjusted OR (95%CI)	Model 3 Adjusted OR (95%CI)	Model 4 Adjusted OR (95%CI)
Total sample				
Financial difficulties	1.14 (1.08–1.2)**	1.14 (1.08–1.21)**	1.14 (1.07–1.21)**	1.07 (1–1.14)[NS]
Men				
Financial difficulties	1.17 (1.08–1.27)**	1.18 (1.08–1.28)**	1.18 (1.08–1.29)**	1.07 (0.97–1.18)[NS]
Women				
Financial difficulties	1.11 (1.04–1.19)**	1.12 (1.03–1.21)**	1.11 (1.02–1.2)*	1.05 (0.97–1.15) [NS]

Model 1: financial difficulties and suicidality association.
Model 2: financial difficulties and suicidality association adjusted for income.
Model 3: financial difficulties and suicidality association adjusted for income and major depression.
Model 4: financial difficulties and suicidality association, adjusted for income, major depression, education and employment status.
OR: odds ratio, 95%CI : confidence intervals,.
* statistically significant association at $p < 0.05$.
** statistically significant association at $p < 0.01$.
NS statistically non-significant association.

differentiated by gender only to some extent: low income was a risk factor for major depression in men; while high income was a protective factor against major depression in women; (ii) the association between income and suicidality was differentiated by gender: income had a negative impact on suicidality in men but not in women; (iii) financial difficulties were found to exert a strong independent effect on the prevalence of major depression, but not on suicidality in both genders (iv) the strength of association between economic hardship (objective and subjective) and mental health outcomes (major depression and suicidality) was stronger for men than for women (Table 5).

4.1. Economic hardship and major depression

The influence of income on major depression should be regarded separately for men and women, as the results that emerged for the total sample were largely driven by findings in women. In male participants, income lower than 1000€ was found to constitute a risk factor for major depression. On the contrary, monthly income higher than 1500€ acted in a protective manner against depression in women. Nonetheless, the strength of association between income and major depression was reduced, when financial difficulties were entered into the models. Congruent with this, the impact of income on major depression is explained to a large extent by financial difficulties and other socio-demographic variables; however it also exerts an independent effect. In this reasoning, our study verifies the mediating influence of financial difficulties in the association between income and common mental disorders, as raised by other studies (Ahnquist and Wamala, 2011; Jenkins et al., 2008); however, it extends their findings by highlighting that low to medium income constitutes a risk factor for major depression in men; whereas high income constitutes a protective factor against major depression in women.

On the other hand, financial difficulties bore a strong and independent effect on major depression in both genders. This finding is concordant with a growing body of research corroborating a strong influence of subjective measures of economic hardship on common mental disorders (Ahnquist et al., 2007,Ahnquist and Wamala, 2011; Jenkins et al., 2008; Laaksonen et al., 2007; Meltzer et al., 2013; Muntaner et al., 2004; Skapinakis et al., 2006; Weich and Lewis, 1998).

4.2. Economic hardship and suicidality

Findings on the association between income and suicidality resemble those of the US National Epidemiologic Survey of Alcohol and Related Conditions (NESARC). In particular, low levels of income were found to bear a significant association with mental disorders and suicide attempts, after controlling for key socio-demographic variables (Sareen et al., 2011). Nonetheless, evidence from our study reveals that the results observed for the total sample were driven by those recorded in male participants. Congruent with this, similarly to the association between income and major depression, the link between income and suicidality is gender-specific. Income is an independent risk factor for suicidality in men, but not in women. It is noteworthy that this association in men was observed even after controlling for the influence of major depression. This finding concurs with evidence indicating that economic factors may predict suicide independent of mental health status (Hintikka et al., 1998).

Interestingly, financial difficulties were not found to have an association with suicidality. This is in stark contrast to studies highlighting the importance of subjective measures of economic hardship in driving mental health outcomes (e.g. Ahnquist and Wamala, 2011; Jenkins et al., 2008; Meltzer et al., 2013; Skapinakis et al., 2006). Furthermore, it is in disagreement with the work by Meltzer et al. (2011), which showed that people in debt displayed twice the odds of reporting suicidal ideation, after controlling for various socio-demographic, economic, social and lifestyle factors.

4.3. Interpretations

The conflicting results between our study and findings from previous studies can be explained by cultural issues and the enduring nature of the recession in Greece, including its strict austerity measures.

As regards the cultural context, in the wake of the economic crisis, Greece had already had weak welfare safety nets with expenditure on social protection being substantially lower than the European average (Matsaganis, 2013; Souliotis et al., 2016). While the recession could have provided a window of opportunity for reforms that would bolster the welfare state (Pierson, 2004), the social safety nets in the country have not been properly tightened. In fact, in accordance to data emanating from the OECD Social Expenditure Database, social expenditure fell steeply in 2013 in the country; whereas reductions in social spending were greater than reductions in GDP (−27.2% vs. −20.9% in real terms the time period 2009–2013, OECD, 2013). Congruent with these, these gaps in social safety nets may explain the adverse impact of income on major depression and suicidality in our study. This is in line with the contention that the egalitarian socio-economic policies in the Nordic countries have managed to offset the impact of income on health (Lorant et al., 2003). Additionally, the presence of an association between income and suicidality, and not between economic difficulties and suicidality, is probably explained by the limited potential of an upward change in income levels in Greece among the recession. This may also provide an explanation for the alarmingly high prevalence of both major depression and suicidality among the low income groups. Throughout the recession, unemployment rates have soared and almost 36% of the population is at risk of poverty or social exclusion (Hellenic

Statistical Authority, 2016). In this rationale, any improvement in income levels appears illusory (GSEEVE, 2015). It is perhaps this income level stagnation that triggers a generalized feeling of hopelessness and dead-end, which in turn impinges on suicidality. On the other hand, the more subjective measures of economic hardship are perhaps experienced as being more manageable. People can delay payments to manage their debt and they can speak about their difficulties to other people, who may provide emotional or instrumental support accordingly

4.4. Socio-economic variable and mental health outcomes from a gender perspective

Results of the particular study substantiate a moderating influence of gender. This parallels findings from another study which investigated the impact of the enduring recession on suicide rates in the country (Antonakakis and Collins, 2014). Specifically, these authors demonstrated that the influence of fiscal austerity on suicides was gender specific, as it drove increases in male suicide rates but not in females.

A possible account for this gender influence pertains to the traditional structure of the Greek society, where men are still considered family breadwinners. This is in line with evidence suggesting that the global financial crisis has gravely hit men due to its disproportionate impact on traditional male industries (Dunlop and Mletzko, 2011). In particular, roughly 75% of jobs lost since the outset of the crisis worldwide were occupied by men (Taylor et al., 2010). Likewise in Greece the decline in employment rate was more pronounced among male workers aged between 30–44 years old: from 93.8% in 2008 to 74.1% in 2013, a stark drop of 21% in less than 5 years (Matsaganis, 2013). As a corollary of these, men with low or no income may feel worthless, as they fail to fulfill their social role, and hence symptoms of major depression and suicidality may ensue. On the contrary, women seem to derive their self-worth mainly from the family-relationships domain and therefore the impact of income on their mental health is of secondary importance. This is in line with evidence suggesting that domestic responsibilities and marital issues are stronger predictors of suicidality in women than socio-economic stressors (Andres et al., 2010; Payne et al., 2008). Alternatively, alcohol use, which is a reported risk factor for suicide and is more prevalent among low socio-economic groups and men (Cavelaars et al., 1997; Kessler et al., 1994), may be another explanation for the differential influence of income on suicidality in the two genders. Therefore, a future study should investigate the mediating influence of alcohol use in the association between economic variables and mental health outcomes in the two genders.

4.5. Strengths & limitations

To the authors' knowledge, this is the first study to investigate the influence of a conventional indicator of economic hardship (i.e. income) as well as of a subjective measure (i.e. financial difficulties) on salient mental health outcomes (major depression and suicidality) during a time of enduring recession. Moreover, the analysis was also performed separately for men and women, in line with the international literature (e.g. Ahnquist and Wamala, 2011; Ahnquist et al., 2007. Among the methodological strengths of the present study was that major depression was assessed with a clinical tool rather than a screening test.

Nonetheless, the study has certain limitations that warrant consideration. The cross-sectional design of the study does not allow for causal inferences to be made and especially one cannot disentangle between the social causation (i.e. socio-economic variables cause mental illness) and the social selection hypothesis (i.e. the presence of mental illness cause low income and economic difficulties). Furthermore, respondents' information on income was not cross-validated. Thus the possibility that false information regarding one's economic status was provided (for example due to feelings of embarrassment) cannot be excluded. We believe that due to the economic crisis, which has "normalized" the presence of financial strain to a large extent, respondents would not object to disclosing truthfully their financial state; however, one cannot exclude the possibility of misclassification bias in the design. Similarly, there was a mismatch between financial difficulties which refer to the financial state of a household and personal income, which denotes the respondent's financial state. It would have been more suitable to include household income, after adjusting for the number of household members; however, in previous surveys of our research group women respondents' had some difficulty in computing their household's monthly income, jeopardizing in this way the validity of their answers.

In addition, the mode of sampling and data collection - i.e. telephone survey- may have resulted in sampling bias, as it is likely that people with low income or dire financial difficulties could not have afforded a fixed phone line and thus they were missed from the study. This drawback could have been circumvented, if a household survey was conducted. Nonetheless, the study was a part of a series of repeated cross-sectional surveys following the same methodology and therefore refinements in the methods could not have occurred throughout the years. Furthermore, household surveys have a low response rate in Greece amid the recession (e.g. Skapinakis et al., 2013) raising concerns over sample representativeness and sampling bias. In a similar vein, men, people with financial difficulties, persons with depression and people with suicidality may have declined to respond to the survey and hence non-response bias may have occurred.

It is noteworthy that assessing suicidality with two questions enquiring about the presence/absence of suicidal ideation and suicidal attempt (i.e. binary variables) may also constitute a limitation of the study design, as evidence substantiates a dimensional conceptualisation of suicidality (Rudd, 2009). Nonetheless, our study was designed to be comparable to previous studies conducted in Greece prior to the crisis as well as to those of the international literature, where a similar assessment approach may be discerned (e.g. Kessler, Borges & Walters, 1999).

Findings from the present study substantiate the sheer impact of both objective and subjective measures of economic hardship on mental health outcomes in times of enduring recession. Gender-sensitive policies and interventions should be geared towards softening the social effects of the recession in the country.

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Conflict of interest

The authors have no conflicts of interest to declare.

Ethical standards

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, as revised in 2008.

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Supplementary materials

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