

## The Shame and Psychopathology Effect on Somatization. A comparative Study Between Financial and Health Crisis Periods

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### Abstract

The aim of this study is to investigate the similarities and the differences of the psychological reactions during the economic and the health crisis (Covid-19). In total 818 Greek citizens, 408 during the financial and 410 during health crisis, 611 female and 207 male, of median age of 24 years, participated in the study. The participants older than 30 years old found to suffer less psychological strain than the younger ones, and the age effect was larger during health than financial crisis. Women were more prone than men to report health-related symptoms at ages less than 30 years old and they characterized by larger shame and psychopathology scores. During the ongoing health crisis, shame had not a direct somatization effect. It is suggested that interventions aiming to improve the management of shame feelings will reduce the induced psychological tension as well as the consequent occurrence of somatization symptoms.

**Keywords:** Financial Crisis, Health Crisis, Covid-19, Shame, Psychopathology, Somatization

### Introduction

Since the global economic crisis began in 2008, Greece has experiencing a major economic crisis. In April of 2010, the Hellenic Republic asks for help from European and International organizations. Indeed, Greek economy was placed under the surveillance of the International Monetary Fund, European Commission and the European Central Bank. Hellenic Republic signed onto the first Economic Adjustment Programme in 8 May 2010 and this included several austerity measures and structural reforms aimed at reducing the general government deficit and achieving public debt sustainability in the long run [1]. Finally, Greece signed 2

more Economic Adjustment Programs in March of 2012 and July of 2015 [2, 3]

For 10 years the Greek economy was in a phase of severe recession, characterized by high unemployment and reduction of GDP [2]. The bailout packages included several measures, including significant wage and pension reductions as well as tax increases.

The crisis has had a direct effect on the Greek health care system, which faced financial difficulties and structural problems long before the crisis began [4]. Many health reforms, such as the re-

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duction in pharmaceutical expenditures and the structural reform of social health insurance funds, had been on the table for many years, but the absence of political will to promote these changes made these only exercises on paper [5]. However, when these reforms were finally implemented as commitments of bailout packages, the Greek economy was already deteriorating severely. The implementation of public cuts resulted in a 25% reduction in health expenditures between 2008 and 2012 [6].

Several studies have noticed the impact of economic crisis on health of Greek citizens. Specifically, surveys suggest that the current economic crisis is associated with a drop in self-rated health status, a negative impact on self-rated health trends and non-use of health services for economic reasons [7-9].

Also, a gradual but steady rise has been documented in one-month prevalence of major depression in Greek citizens from 3.3 % in 2008 to 6.8 % in 2009 and 8.2 % in 2011 [10, 11].

In addition, financial crises affect the mental health. Indeed, Greece got hurt a lot with a substantial increase in the prevalence of suicidal ideation and reported suicide attempts between 2009 and 2011. People suffering from depression, men, married individuals, and people experiencing financial strain, people with low interpersonal trust, and those with a previous history of suicide attempts were particularly vulnerable [12]. Suicide mortality rates were increased by 55.8% between 2007 and 2011 while the total mortality was increased by 1.1% only [13].

After 10 years Greece eventually exited from bailout programs on 20 August 2018 and on 9 October 2019 in historic first, investors was buying Greece's short-term debt at a negative yield, meaning they volunteered to get less money back than they paid.

Unfortunately, in 2020, period that Greece is trying to keep GDP growth rates, coronavirus is appeared. On December of 2019, China reported a cluster of pneumonia cases of unknown cause that would later be identified as severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) [14- 16].

As of 23 June 2020, there had been 8.993.659 confirmed cases of Covid-19 reported globally, and 469.587 deaths had been reported [17]. In recognition of the widespread global transmission of COVID-19, the World Health Organization declared COVID-19 to be a pandemic on March 11, 2020 [18]. The first case of Covid-19 in Greece appeared on February 26, 2020 [19]. On March 11, 2020, due to virus infection outbreak, Greek government decided the closure of all educational structures and the suspension of the operation of food and drink shops, shopping malls, sports facilities, etc According to Greek National Health Organization, all the cases that have been confirmed as COVID-19 until 5th January 2021 were 141.453 and 5.051 dead [19]. The median age of those who died was 79 years.

Patients with confirmed or suspected 2019-nCoV (new coronavirus disease) may experience with fear of the new virus, and those in quarantine might experience boredom, loneliness, and anger

[20]. The most recent similar situation was the Severe Acute Respiratory Syndrome (SARS) outbreak in 2002. In the early phase of the SARS outbreak, a range of psychiatric morbidities, including persistent depression, anxiety, panic attacks, psychomotor excitement, psychotic symptoms, delirium, and even suicidality, were reported [21-23].

As the COVID-19 pandemic continues to spread and not much is known about changes in levels of psychological impact, stress, anxiety and depression during this pandemic, it is important to investigate the psychological impact on the Greek population and to enlighten the similarities and the differences of the population's psychological reaction to it comparing to the financial crisis period which has been adequately studied in recent years [24].

### **Aim and Scope**

In both financial and the health crisis periods, a fear of a social stigma arises either from the failure to meet financial obligations during financial crisis or the feeling of social exclusion imposed due to the contagion of the virus during health crisis, or even both. Consistently to the biopsychosocial perspective, those inferiority feelings affect the person's innate need for attachment and group belonging [25-27]. Inevitably and shame feelings are created, whether those feelings are related to the inability to meet life pursuits and goals, or inferiority feelings regarding the subject's position comparing to his social environment. These feelings about the subject's social image reflect the global aspects of the self. Consistently with Tracy and Robbins' model, shame can be seen as an indicator of the subject's psychopathology or, as is commonly reported in the literature, shame can be considered as a direct psychopathology effect [28-30]. Even more, since the subsequent increased psychological pressure, is not always being consciously understood undesirable psychosomatic symptoms are reported expressed in rather unpredictable ways as cardiovascular disease or anxiety disorders as panic attacks and phobias [31-33].

The aim of this study is to provide insight into the similarities and the differences between the psychological reaction of Greek citizens during the financial crisis and the first phase of the ongoing pandemic crisis, focusing more specifically on the influence of shame on psychopathology and somatization incidences. In that context, shame was regarded as both external and internal where external shame is considered to be focused on the experience of the self as seen by others, whereas internal shame is conceptualized as self-focused negative evaluations and feelings about the self.

### **Method**

#### **Participants and Study Design.**

The data collection was carried out in two time periods, during spring and summer of 2012 in the midst of the economic crisis in Greece and in winter of 2020 during the coronavirus pandemic. A convenience sample of 818 persons, 611 female and 207 male, of median age of 24 (M = 32,9, SD = 14,8 years) were participated in the study, evenly divided into the two groups (408 during economic crisis and 410 during health crisis). Approximately four out of ten participants (N = 349, 42,7%) were students.

The apparent bimodal age distribution (Figure 1) indicated the replacement of the age variable with a binary factor separating the sample into two groups at age 30 years old and the usage of this

binary age factor in the statistical analysis instead of the original age values. The psycho-demographic sample characteristics for each sampling period are presented in Table 1.

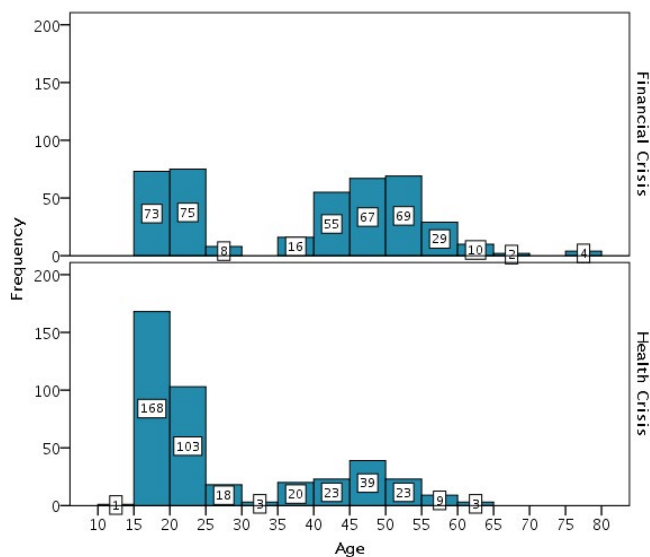


Figure 1: Age distribution by sampling period

Table 1: Psycho-demographic and health indicators of the sample

	Financial Crisis (N = 408)		Health Crisis (N = 410)	
Sampling period	2012 (Spring, Summer)		2020 (Winter)	
Age (AGE)	M (SD)	38,1 (15,2)	M (SD)	27,6 (12,4)
	Median	43 years	Median	20 years
	Range	62 years	Range	52 years
	≤ 30	38,2%	≤ 30	71,0%
	> 30	61,8%	> 30	29,0%
Gender (GND)	N (%)		N (%)	
	Women	268 (65,7%)	343 (83,7%)	
	Men	140 (34,3%)	67 (16,3%)	
Occupation	155 (38,0%)		194 (47,3%)	
	Student	54 (13,2%)	99 (24,1%)	
	Public sector	113 (27,7%)	64 (15,6%)	
	Private sector	86 (21,1%)	53 (12,9%)	
Other (unemployed, retired)				
Heart problems (HRP)	149 (36,5%)		203 (49,5%)	
Tachycardia	129 (31,6%)		190 (46,3%)	
Hypertasis	41 (10%)		28 (6,8%)	
Indicators of psychological burden (MHB)				
Phobia (PHO)	159 (39,0%)		216 (52,7%)	
Panic attacks (PAN)	72 (17,6%)		143 (34,9%)	
Psychological indexes	M (SD)		M (SD)	
Global Severity Index (GSI)	0,81 (0,52)		0,9 (0,59)	
Other As Shamer Scale (OAS)	15,9 (9,8)		19,3 (11)	
Experience of Shame Scale (ESS)	46,7 (13,5)		55,6 (15,6)	

In both periods, the Symptom Check List 90 (SCL – 90 – R), the Experiences of Shame Scale (ESS) and The Other As Shamer Scale (OAS) was assessed in order to evaluate individual’s psychopathology as well as certain types of shame experiences. Further, the participants was asked to report whether they suffer from atypical heart-related symptoms (that is excluding coronary artery disease) as well as whether they experience signs of psychological burden (phobia or panic attacks).

The Experiences of Shame Scale (ESS) is a 25-item measure that assesses the frequency of shame experiences related to one’s character (“Have you ever felt ashamed of the sort of person you are?”), behavior (“Have you tried to cover up or conceal things you felt ashamed of having done?”), and body (“Have you avoided looking at yourself in the mirror?”). Using a scale from 1 (not at all) to 4 (very much), participants rated the frequency of their shame experiences over the past year. Research has shown the ESS to have good discriminant and construct validity, as well as high test-retest reliability [29, 34].

The Other As Shamer Scale (OAS) is a modification of a subset of the items from the Internalized Shame Scale. The original statements were rewritten to reflect a person’s perception of what others feel about him or her, e.g. “I think that other people look down on me”. The total scale consists of 18 items, inferiority (7 items), emptiness (4 items), how others behave when they see me make mistakes (6 items), while an item included in the total scale is not an item on any of the subscales. Answers range on a 5-point scale: 0 = “never,” 1 = “seldom,” 2 = “sometimes,” 3 = “often,” 4 = “almost always” [35, 36].

The Symptom Check List 90 (SCL-90-R) (Derogatis, 1983) is a widely used screening tool for assessing mental well-being. It contains 90 items with a 5-point scale (0 = not at all, 4 = extremely), and assesses symptomatology in nine areas (Somatization - SM, Obsessive-Compulsive - OC, Interpersonal Sensitivity - IS, Depression - DR, Anxiety - AN, Aggression - AG, Phobia - PH, Paranoid Ideation - PI, Psychoticism - PS). The average score of all 90 items yields the global severity index (GSI), which represents the overall level of distress and suggested to be the best single indica-

tor of the current level of the disorder (Derogatis, 1983). Higher scores on the scales of the SCL-90-R indicate higher distress, however it should be noted that individual scales cannot be interpreted in diagnostic categories.

The Greek versions of the OAS and ESS questionnaires have been translated and validated into Greek by members of the research team [34, 36].

### Statistical Analysis

Cohen’s kappa was computed in order to determine the significance of the concurrence among the three reported somatization symptoms. Analysis of variance and logistic regression analysis were applied in order to find the gender (male / female), age ( $\leq 30$  y.o.,  $>30$  y.o.) and sampling period differences on shame, psychopathology and somatic symptoms. Then, a path model was formulated, in order to provide an estimation of the overall demographic and shame variables effect on somatization under the hypothesis that shame is a regressor of psychopathology. The ratio of whole sample size to number of free parameters was equal to 28,2, considered as very good for testing on the whole sample and adequate for testing on each sampling period separately [37]. The model was fitted in the total sample as well as separately on financial and on health crisis samples and maximum likelihood method was used to estimate the model’s parameters. The difference of the overall fit of the model on the two groups as well as between the corresponding coefficients of any selected path of the model was assessed by the likelihood ratio test for nested models [38].

All data were analyzed using SPSS statistical package (version 21) and R statistical language equipped with lavaan package [39, 40].

### Results

The general symptom index was significantly correlated with the SCL-90R subscales, confirming its suitability as a unique index of an individual’s psychopathology (Table 2). The three somatization symptoms had significant concurrence during both sampling periods (Table 3), while shame was significantly positively correlated with the general symptom index (Table 4).

**Table 2: Correlation of general symptom index (GSI) with the subscales of SCL – 90R.**

SOM	OC	IS	DEP	ANX	HOS	PHB	PAR	PSY
,781**	,871**	,854**	,914**	,907**	,713**	,757**	,786**	,854**

\*\* . Correlation is significant at the 0.01 level (2-tailed).

**Table 3: Cohen’s kappa and percent agreement among psychological symptoms**

	Financial Crisis		Health Crisis		Whole sample	
	Phobia	Panic attacks	Phobia	Panic attacks	Phobia	Panic attacks
Panic attacks	0,171** (64,4%)		0,160** (57,3%)		0,185**	
Heart problems	0,197** (62,3%)	0,246** (68,9%)	0,108* (55,4%)	0,315** (65,8%)	0,166** (58,8%)	0,301** (67,3%)

\*\* Kappa coefficient is statistically significant at 0,01 level

\* Kappa coefficient is statistically significant at 0,05 level

**Table 4: Descriptive statistics and correlation among the psychometric scales**

	N	a	M (SD) Financial	Pearson's r Health	Total	OAS	ESS
OAS	18	0,828	15,9 (9,8)	19,3 (11,0)	17,6 (10,5)		
ESS	25	0,826	46,8 (13,4)	55,6 (15,6)	51,2 (15,2)	,658**	
GSI	90	0,808	0,81 (0,52)	0,90 (0,59)	0,85 (0,56)	,691**	,647**

\*\* Correlation is significant at the 0.01 level (2-tailed).

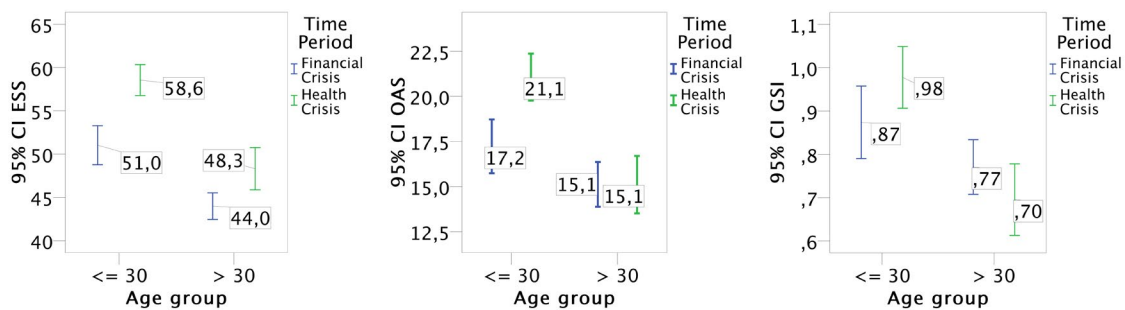
Older than 30 years old participants had smaller shame and psychopathology scores comparing to the younger participants (Table 5, FOAS(1, 811) = 18,885,  $p < 0,001$ , FESS(1, 811) = 38,883,  $p < 0,001$ , FGSI(1, 811) = 10,041,  $p = 0,002$ ), while health crisis period was characterized by a larger difference in external shame and general symptom index scores in favour of the older participants (Figure 2) (FOAS(1, 811) = 8,779,  $p = 0,003$ , FGSI(1, 811) = 7,575,  $p = 0,006$ ). The sampling period main effect on shame

scales (FOAS(1, 811) = 4,927,  $p = 0,027$ , FESS(1, 811) = 18,609,  $p < 0,001$ ) was also vividly demonstrated, due to the higher shame scores during health crisis (Table 4, OAS: 19,3 vs. 15,9, ESS: 55,6 vs. 46,8). Further, women were characterized by a larger internal shame score than men (52,6 vs. 46,9, FESS(1, 811) = 5,225,  $p = 0,023$ ) as well as larger than men general symptoms index score (0,90 vs. 0,70, FGSI(1, 811) = 16,848,  $p < 0,001$ ).

**Table 5: Univariate analysis results for shame and general symptom index**

Factor	df(1)	OAS		ESS		GSI	
		F	p	F	p	F	p
Corrected Model	6	10,280	,000	26,559	,000	8,340	,000
Intercept	1	1373,1	,000	6373,7	,000	1036,8	,000
Sampling Period	1	4,927	,027	18,609	,000	,001	,979
Gender	1	2,058	,152	5,225	,023	16,846	,000
Age	1	18,885	,000	38,883	,000	10,041	,002
Sampling Period * Age	1	8,779	,003	2,987	,084	7,575	,006
Gender * Age	1	,515	,473	,154	,695	,093	,760
Sampling Period * Gender	1	1,050	,306	,111	,739	,181	,671
		$R^2 = ,071$ ( $R^2_{adj} = ,064$ )		$R^2 = ,162$ ( $R^2_{adj} = ,156$ )		$R^2 = ,058$ ( $R^2_{adj} = ,051$ )	

(1) Error: 811, Total: 818, Corrected Total: 817



**Figure 2: Sampling period interaction with age group on shame and psychopathology**

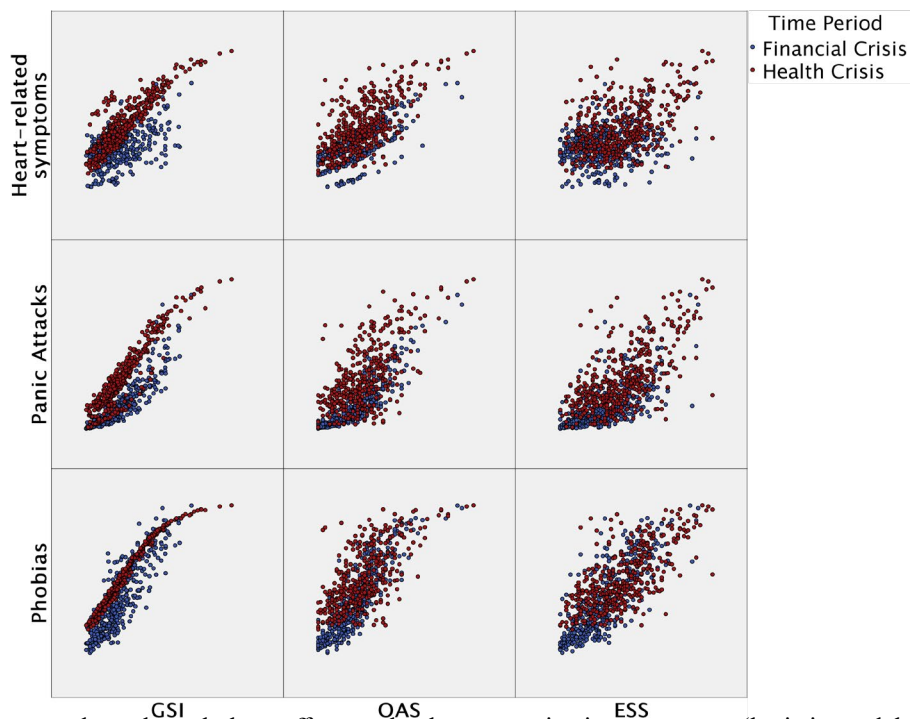
The results of the three logistic regression models are presented in Table 6. An overall positive relation of shame and psychopathology scores on the three somatization symptoms was vividly present (Figure 3). Health crisis period was characterized by a higher probability of reporting phobias ( $B = 1,774$ ,  $OR = 5,892$ , 95% C.I. 1,466 – 23,678,  $p = 0,012$ ).

**Table 6: Logistic regression results for heart symptoms, panic attacks and phobias**

Factor	HRT		PAN		PHO	
	B	p	B	p	B	p
Constant	-1,202	,013	-3,129	,000	-3,087	,000
Sampling Period	,205	,757	,775	,337	1,774	,012
Gender	-,756	,072	-,275	,592	-,465	,258
Age	,389	,132	-,100	,758	,375	,161
Symptom Index (GSI)	,145	,627	,915	,010	,741	,017
External Shame (OAS)	,038	,014	,046	,014	,046	,006
Internal Shame (ESS)	-,007	,509	,000	,984	,024	,041
Sampling Period*Age	-,026	,940	,484	,234	-,345	,322
Sampling Period*Gender	,551	,202	-,709	,192	,260	,548
Sampling Period*GSI	,988	,018	,391	,404	,776	,081
Sampling Period*OAS	-,023	,277	-,039	,111	-,051	,027
Sampling Period*ESS	,000	,998	,007	,704	-,020	,203
Gender * Age	,973	,023	,172	,750	,165	,700
Omnibus test / PAC	c <sup>2</sup> (12) = 77,2** / 64,1%		c <sup>2</sup> (12) = 145,9** / 77,9%		c <sup>2</sup> (12) = 155,3** / 69,3%	
Cox & Snell / Nagelkerke R2	0,09 / 0,121		0,163 / 0,239		0,173 / 0,231	

The probability of reporting panic attacks or phobias was significantly related to an one unit increase on the general symptom index (PAN: B = 0,915, OR = 2,496, 95% C.I. 1,239 – 5,031, p = 0,010 and PHO: B = 0,741, OR = 2,098, 95% C.I. 1,139 – 3,863, p = 0,017), while external shame (OAS) was significantly related to increased probability of reporting all three somatization symptoms

(HRP: B = 0,038, OR = 1,039, 95% C.I. 1,008 – 1,071, p = 0,014, PAN: B = 0,046, OR = 1,047, 95% C.I. 1,009 – 1,085, p = 0,014, PHO: B = 0,046, OR = 1,047, 95% C.I. 1,014 – 1,082, p = 0,006). A significant effect of internal shame (ESS) was also found on the probability of phobias incidences (B = 0,024, OR = 1,024, 95% C.I. 1,001 – 1,048, p = 0,041).



**Figure 3: Shame and psychopathology effect on the three somatization symptoms (logistic model predicted probability)**

The psychopathology somatization effect on heart related symptoms was found to be significantly larger during health crisis period comparing to the financial crisis period. (B = 0,998, OR = 2,687, 95% C.I. 1,185 – 6,093, p = 0,018). In the same vein, an

increase of one unit in external shame (OAS) corresponded to a higher risk for reporting phobias (PHO) during health crisis comparing to financial crisis (Figure 3) (B = -0,051, OR = 0,951, 95% C.I. 0,909 – 0,994, p = 0,027).

**Table 7: Gender effect on heart symptoms by age group and sampling period(1)**

Age	Gender	Logit (B)		Odd Ratio(2)		Expected Probability(3)	
		Financial	Health	Financial	Health	Financial	Health
>30	Male	-0,221	1,474	0,802	4,366	44,5%	81,4%
>30	Female	-0,438	0,706	0,645	2,026	39,2%	66,9%
≤ 30	Male	-1,583	0,138	0,205	1,148	17,0%	53,4%
≤ 30	Female	-0,827	0,343	0,437	1,409	30,4%	58,5%

(1) Computed at mean levels of shame and psychopathology (GSI: 0,56, OAS: 10,5, ESS: 15,2)

(1) Exp(Logit)

(2) Odds / (1 + Odds)

**Table 8: Analysis of variance and logistic regression significant differentiations**

Factor	Analysis of variance			Logistic regression		
	OAS	ESS	GSI	HRP	PAN	PHO
Period	Health > Financial*	Health > Financial**	ns	ns	ns	Health > Financial*
Age	(≤ 30) > (>30)*(Health > Financial)**	(≤30) > (>30)**	(≤30) > (>30)**(Health > Financial)**	ns	ns	ns
Gender	ns	Female > Male*	Female > Male**	ns	ns	ns
OAS	-	-	-	↑ (OR = 1,039)*	↑ (OR = 1,047)*	↑ (OR = 1,047)**
ESS	-	-	-	ns	ns	↑ (OR = 1,024)*
GSI	-	-	-	↑ (Health > Financial)*	↑ (OR = 2,496)*	↑ (OR = 2,098)*

\* Significant at 0,05 level

\*\* Significant at 0,01 level

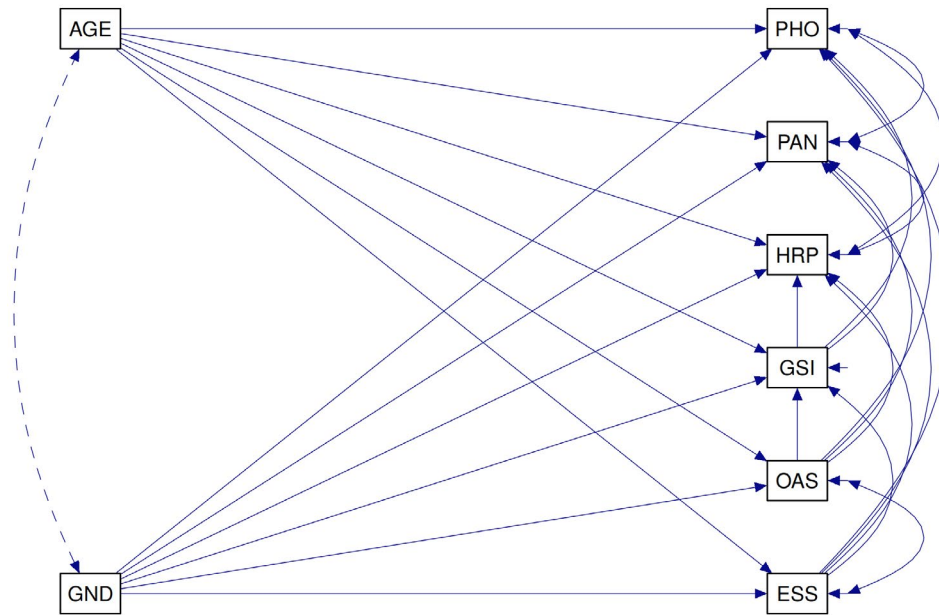
Women reported heart-related symptoms with higher expected probability than men at ages less than 30 years old (Financial: pF = 30,4% vs. pM = 17,0%, Health: pF = 58,5% vs. pM = 53,4%), while men had larger probability than women in the age category over 30 years old (Financial: pF = 39,2% vs. pM = 44,5%, Health: pF = 66,9% vs. pM = 81,4%) (Table 7), a differentiation that was found to be statistically significant in the context of the logistic model (B = 0,973, OR = 2,647, 95% C.I. 1,140 – 6,143, p = 0,023). The analysis of variance and logistic regression results are summarized in Table 8.

### Model Testing For Whole Sample

The shame effect on psychopathology was tested using the path model presented in Figure 4. Shame (ESS, OAS), along with demographic variables (AGE, GND) was regressed on general symptom index (GSI), while both the shame scales and the general symptom index score were regressed on heart related problems (HRP), panic attacks (PAN) and phobias (PHO). The model was first tested for the total sample (N = 818) using the maximum like-

hood estimator. The model explained the 13% of the ESS, 5,1% of OAS, 55,1% of GSI, 5,6 of HRP, 14,5 of PAN and 15,4% of PHO variation.

Shame effect on psychopathology was adequately demonstrated ( $b_{ESS \rightarrow GSI} = 0,353, p < 0,001, b_{OAS \rightarrow GSI} = 0,464, p < 0,001$ ) and the external shame effect on the general symptom index was significantly larger than the corresponding internal shame effect ( $b_{OAS \rightarrow ESS} = 0,111, p < 0,001$ ). In turn, general symptom index had a significant direct effect on all three somatization symptoms (bGSI → HRP = 0,137, p = 0,007,  $b_{GSI \rightarrow PAN} = 0,236, p < 0,001, b_{GSI \rightarrow PHO} = 0,244, p < 0,001$ ). Among the six direct paths originated from the two shame scales (ESS, OAS) to the three somatization symptoms, the coefficients of two was significant ( $b_{ESS \rightarrow PHO} = 0,109, p = 0,022, b_{OAS \rightarrow HRP} = 0,121, p = 0,018$ ), while, when overall effects was considered, external shame had a greater than the corresponding internal shame effect on heart-related symptoms ( $\Delta_{ESS-OAS} = -0,134, p = 0,036$ ).



**Figure 4:** Path model  $ESS + OAS \sim GND + AGE$ ,  $GSI \sim GND + AGE + ESS + OAS$ ,  $HRP + PAN + PHO \sim GND + AGE + GSI + ESS + OAS$

The significant direct effect of both shame scales on the general symptoms index, along with the significant effect of the latter on the three somatization symptoms and the partial lack of direct shame effect on them ( $p_{ESS \rightarrow HRP} = 0,965$ ,  $p_{ESS \rightarrow PAN} = 0,131$ ,  $p_{OAS \rightarrow PAN} = 0,131$ ,  $p_{OAS \rightarrow PHO} = 0,123$ ), implies that the general symptom index is partially mediated the shame effect on somatization symptoms, that is, somatization symptoms are shown to depend on factors that affects psychopathology, other than the trait of shame. That is, shame is emerged as a secondary explanatory factor in interpreting the influence of psychopathology on somatization.

Older than 30 years old participants found to have significantly smaller shame scores ( $b_{AGE \rightarrow ESS} = -0,328$ ,  $p < 0,001$ ,  $b_{AGE \rightarrow OAS} = -0,205$ ,  $p < 0,001$ ) and psychopathology index ( $b_{AGE \rightarrow GSI} = 0,064$ ,  $p = 0,012$ ), having although a greater probability than younger participants to report heart related problems ( $b_{AGE \rightarrow HRP} = 0,090$ ,  $p = 0,015$ ). No significant differences were found concerning age effect on panic attacks ( $p = 0,669$ ) and phobias ( $p = 0,878$ ). Men was characterized by a lower internal shame score ( $b_{GND \rightarrow ESS} = -0,099$ ,  $p = 0,003$ ) and psychopathology index ( $b_{GND \rightarrow GSI} = -0,074$ ,  $p = 0,002$ ) and lower probability than women to report panic attacks ( $b_{GND \rightarrow PAN} = -0,091$ ,  $p = 0,006$ ) and phobias ( $b_{GND \rightarrow PHO} = -0,097$ ,  $p = 0,004$ ).

### Multiple-Group Path Analysis

The constrained model where intercepts and path coefficients were assumed to be equal between financial and health crisis groups, found to have a significantly worse overall fit ( $\Delta c^2(6) = 32,8$ ,  $p < 0,001$ ), thus significant differences in some of the models path's parameters between the two sampling periods was manifested. The

model's regression coefficients for psychopathology are presented in Table 9, while the corresponding somatization effects are presented in Table 10. Age, gender and shame, were adequately explained the general symptom index (GSI) variation ( $R^2_{Financial} = 0,542$  and  $R^2_{Health} = 0,575$ ). The most important of the whole sample analysis findings were confirmed on both crisis periods:

- Younger than 30 years old participants found to have significantly larger internal shame (ESS) score (Financial:  $b_{AGE \rightarrow ESS} = -0,236$ ,  $p < 0,001$ , Health:  $b_{AGE \rightarrow ESS} = -0,298$ ,  $p < 0,001$ ), and lower probability of reporting heart-related symptoms (HRP) than the older participants (Financial:  $b_{AGE \rightarrow HRP} = 0,135$ ,  $p = 0,008$ , Health:  $b_{AGE \rightarrow HRP} = 0,119$ ,  $p = 0,034$ ).
- Women had larger general symptom index (GSI) than men (Financial:  $b_{GND \rightarrow GSI} = -0,206$ ,  $p < 0,001$ , Health:  $b_{GND \rightarrow GSI} = -0,175$ ,  $p = 0,021$ ).
- Shame (ESS, OAS) was significantly affected psychopathology (GSI), (Financial:  $b_{ESS \rightarrow GSI} = 0,369$ ,  $p < 0,001$ ,  $b_{OAS \rightarrow GSI} = 0,437$ ,  $p < 0,001$ , Health:  $b_{OAS \rightarrow GSI} = 0,355$ ,  $p < 0,001$ ,  $b_{OAS \rightarrow GSI} = 0,466$ ,  $p < 0,001$ ) and external shame (OAS) was found to be a significantly more important regressor than internal shame (ESS) onto general symptom index (Financial:  $b_{ESS - OAS} = -0,009$ ,  $p = 0,014$ , Health:  $b_{ESS - OAS} = -0,012$ ,  $p = 0,001$ ).
- The psychopathology (GSI) and external shame (OAS) effects on panic attacks (PAN) and phobias (PHO) was confirmed (Financial:  $b_{GSI \rightarrow PAN} = 0,196$ ,  $p = 0,004$ ,  $b_{OAS \rightarrow PAN} = 0,010$ ,  $p < 0,001$ , Health:  $b_{GSI \rightarrow PAN} = 0,271$ ,  $p < 0,001$ ,  $b_{OAS \rightarrow PAN} = 0,008$ ,  $p = 0,005$ ).
- The general symptom index (GSI) was fully mediating the relation between internal shame (ESS) and heart related symptoms (HRP). Thus, internal shame is emerge as a secondary explanatory variable as far as heart related symptoms are concerned.



Further, group comparison showed that during financial crisis, external shame (OAS) had a larger total effect than internal shame (ESS) on heart-related symptoms (HRP) ( $\Delta_{\text{ESS-OAS} \rightarrow \text{HRP}} = -0,010, p = 0,044$ ). On the other hand, during health crisis, younger participants were characterized by larger external shame (OAS) (bAGE

$\rightarrow \text{OAS} = -0,247, p < 0,001$ ) and larger general symptom index (GSI) score (b<sub>AGE  $\rightarrow$  GSI</sub> = -0,283, p < 0,001). Health crisis was also the period where women had significantly larger probability than men to report panic attacks (PAN) (b<sub>GND  $\rightarrow$  PAN</sub> = -0,194, p = 0,001).

**Table 9: Path model's psychopathology parameters**

	Financial Crisis				Health Crisis				pdiff(3)
	b	b <sub>std</sub> <sup>(1)</sup>	p <sup>(2)</sup>	R <sup>2</sup>	b	b <sub>std</sub> <sup>(1)</sup>	p <sup>(2)</sup>	R <sup>2</sup>	
ESS				0.079				0.092	
GND	-2,950	-0,105	0,033		-2,512	-0,060	0,205		0,856
AGE <sup>(4)</sup>	-6,476	-0,236	0,000		-10,251	-0,298	0,000		0,073
OAS				0.025				0.061	
GND	-2,545	-0,123	0,015		0,029	0,001	0,984		0,143
AGE <sup>(4)</sup>	-1,486	-0,074	0,145		-5,959	-0,247	0,000		0,004
GSI				0.542				0.575	
GND	direct	-0,105	-0,096		-0,143	-0,09	0,005		0.555
	total <sup>(5)</sup>	-0,206	-0,206		-0,175	-0,175	0,021		0.746
AGE <sup>(4)</sup>	direct	0,074	0,069		0,003	0,002	0,952		0.219
	total <sup>(5)</sup>	-0,053	-0,053		-0,283	-0,283	0,000		0.005
ESS	0,014	0,369	0,000		0,013	0,355	0,000		0.695
OAS	0,023	0,437	0,000		0,025	0,466	0,000		0.555
$\Delta_{\text{ESS-OAS}}$	-0,009	-0,009	0,014		-0,012	-0,012	0,001		-

(1) Completely standardized solution

(2) Significance of the hypothesis that the corresponding coefficient is not equal to zero

(3) Significance of the hypothesis that the financial and health crisis coefficients are equal

(4) Age recoded as binary variable at age 30

(5) Total effect computed as the sum of the direct and the indirect effects through ESS and OAS.

**Table 10: Path model's somatization parameters**

	Financial Crisis				Health Crisis				P <sub>diff</sub> <sup>(3)</sup>
	b	b <sub>std</sub> <sup>(1)</sup>	p <sup>(2)</sup>	R <sup>2</sup>	b	b <sub>std</sub> <sup>(1)</sup>	p <sup>(2)</sup>	R <sup>2</sup>	
HRP				0.046				0.088	
GND	direct	0,000	0,009	0,993	0,019	0,294	0,769		0.823
	total <sup>(5)</sup>	-0,020	-0,020	0,697	-0,012	-0,012	0,848		0.927
AGE <sup>(4)</sup>	direct	0,135	0,136	0,009	0,119	0,108	0,030		0.829
	total <sup>(5)</sup>	0,135	0,135	0,008	0,119	0,119	0,034		0.832
GSI	0,036	0,039	0,585	0,246	0,289	0,000	0,021		
ESS	direct	-0,001	-0,041	0,557	-0,001	-0,045	0,524		0.992
	total <sup>(5)</sup>	-0,001	-0,001	0,682	0,002	0,002	0,380		0.370
OAS	direct	0,008	0,169	0,015	0,003	0,056	0,436		0.228
	total <sup>(5)</sup>	0,009	0,009	0,003	0,009	0,009	0,003		0.925
$\Delta_{\text{ESS-OAS}}^{\text{total}}$		-0,010	-0,010	0,044	-0,004	-0,004	0,386		-
PAN				0.117				0.160	
GND	direct	-0,010	-0,012	0,809	-0,152	-0,118	0,010		0.045
	total <sup>(5)</sup>	-0,042	-0,042	0,296	-0,194	-0,194	0,001		0.035
AGE <sup>(4)</sup>	direct	-0,005	-0,007	0,892	0,077	0,073	0,122		0.194

	total(5)	-0,004	-0,004	0,921		0,059	0,059	0,256		0.335
GSI		0,145	0,196	0,004	0,271		0,334	0,000	0,095	
ESS	direct	0,000	-0,005	0,939		0,001	0,044	0,509		0.592
	total <sup>(5)</sup>	0,002	0,002	0,276		0,005	0,005	0,011		0.247
OAS	direct	0,007	0,177	0,008		0,001	0,020	0,770		0.132
	total <sup>(5)</sup>	0,010	0,010	0,000		0,008	0,008	0,005		0.479
$\Delta_{ESS-OAS}^{total}$		-0,007	-0,007	0,057		0,000	0,000	0,911		-
PHO					0.183				0.129	
GND	direct	-0.064	-0.062	0.185		-0,039	-0,029	0,533		
	total <sup>(5)</sup>	-0,117	-0,117	0,020		-0,085	-0,085	0,184		
AGE(4)	direct	0.083	0.083	0.084		0,009	0,008	0,866		
	total <sup>(5)</sup>	0,051	0,051	0,302		0,006	0,006	0,919		
GSI		0.162	0.172	0.009		0,299	0,351	0,000		0.115
ESS	direct	0.005	0.136	0.031		0,001	0,043	0,532		
	total <sup>(5)</sup>	0,007	0,007	0,001		0,005	0,005	0,011		
OAS	direct	0.009	0.173	0.007		-0,002	-0,036	0,608		
	total <sup>(5)</sup>	0,012	0,012	0,000		0,006	0,006	0,048		
$\Delta_{ESS-OAS}^{total}$		-0,004	-0,004	0,417		0,003	0,003	0,502		-

(1) Completely standardized solution

(2) Significance of the hypothesis that the corresponding coefficient is not equal to zero

(3) Significance of the hypothesis that the financial and health crisis coefficients are equal

(4) Age recoded as binary variable at age 30

(5) Total effect computed as the sum of the direct and the indirect effects through GSI and/or ESS, OAS.

## Discussion

In both sampling periods, the prevalence of the three psychosomatic symptoms were significantly larger than the reported global ones before the crises, confirming reports concerning the psychosomatic burden of Greek citizens during financial crisis [11, 12, 41-43]. As expected, shame was positively correlated with general symptom index and heart-related problems were significantly associated with panic attacks [42, 44-46]. The participants older than 30 years old found to suffer less psychological strain than the younger ones, as reflected on the general symptom index and the two shame scales scores and the age effect on shame and psychopathology was bigger during health crisis than on financial crisis. That findings is in agreement with previous reports indicating that shame feelings decreases in middle age until about the age of 50, contributing in addition the remark that an analogous differentiation is valid concerning the general psychopathology of persons older than 30 years old [47]. The common perception that older people's life experience provide them the ability to process more calmly and effectively the great challenges of life is thus confirmed, a finding that was also recently observed on a sample of 3.055 Spanish adults during health crisis [48, 49]. Furthermore, in the context of the path model, older than 30 years old participants, were more prone to report heart-related symptoms reflecting the natural increase with age of the cardiovascular burden [50, 51].

In a recent article, the cross-national lifetime rate of specific phobia was estimated to be 7,4%, being higher in females (9,8%) than

in males (4,9%) [52]. Concerning panic attacks, the estimated affected part of the general population before the financial crisis was reported to be 3,7% with a significant gap between females and males 5,0% vs. 2,0%, [41, 43]. In addition, the epidemiological data of recent decades implies that young women are more vulnerable to heart dysfunctions than men while the relationship seems to reverse in older ages where men seems to be more prone to heart related symptoms [53, 54]. Consistently with that reports, women was found to be more prone than men to report health-related symptoms at ages less than 30 years old, in both sampling periods, while men over 30 had larger probability of reporting analogous problems. Furthermore, under the path model assumptions, the aforementioned gender gap on psychopathology was further demonstrated concerning panic attacks during health crisis and phobias during financial crisis. Women were also found to be more vulnerable than men as far as internal shame and psychopathology is concerned during both periods of time, confirming reports on women's tendency for negative emotions in crisis situations, whether they involve shame or mood disorders in general [47, 55-57].

In the context of the path model, the internal and external shame effect on psychopathology was adequately demonstrated, while external shame found to have a significantly larger than the internal shame effect on psychopathology, suggesting that during both crises, negative experiences of the self as seen by others, as an indicator of a primitive anxiety of being rejected by the group,

have a larger impact on the self than the self-generated negative evaluations and feelings about the self [58].

The general symptom index was found to fully mediate internal shame's effect on tachycardia or hypertasis symptoms. The mediating position of the general symptom index was particularly evident during the health crisis period where this property was confirmed between all the six model paths from the internal and external shame scales to the three psychosomatic symptoms. Thus, the subject's shame feelings, although induce a significant effect on the subject's general mental state, they are not reflected directly to somatization symptoms, indicating the existence of another trait of personality that acts as a moderator between shame and somatization. It is suggested that guilt, as the emotional feeling involving the subject's self-criticism for the harm it may cause to others, is a candidate moderator. Indeed, in both crisis periods unpleasant consequences could be derived from the actions of the subject, either because a financial failure would deteriorate the financial situation of other people as well, or because the potential status of the virus carrier will make the subject the infection cause of other citizens with potential fatal evolution. The role of guilt and shame on the psychological status of a subject has been recently reported for the health crisis period, however, no research efforts have been devoted concerning the suggested moderator effect of guilt on the shame and somatization relation, setting an interesting research goal for future research [59-62].

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#### Conflict of interest statement

The authors have no conflict of interest to declare.

#### References

1. European Commission. (2011). The economic adjustment programme for Greece: Second review, autumn 2010. Publications Office of the European Union.
2. European Commission. (2013). The second economic adjustment programme for Greece: Third review - July 2013. Publications Office.
3. European Council. (n.d.). Greece: The third economic adjustment programme. Retrieved 5 January 2021.
4. Mossialos, E., Allin, S., & Davaki, K. (2005). Analysing the Greek health system: a tale of fragmentation and inertia. *Health economics*, 14(S1), S151-S168.
5. Economou, C., Kaitelidou, D., Kentikelenis, A., Maresso, A., & Sissouras, A. (2015). The impact of the crisis on the health system and health in Greece. In *Economic crisis, health systems and health in Europe: Country experience* [Internet]. European Observatory on Health Systems and Policies.
6. OECD. (2014). *Health Statistics 2014—How does Greece compare?* Organisation for Economic Co-operation and Development.
7. Zavras, D., Tsiantou, V., Pavi, E., Mylona, K., & Kyriopoulos, J. (2013). Impact of economic crisis and other demographic and socio-economic factors on self-rated health in Greece. *The European Journal of Public Health*, 23(2), 206-210.
8. Vadoros, S., Hessel, P., Leone, T., & Avendano, M. (2013). Have health trends worsened in Greece as a result of the financial crisis? A quasi-experimental approach. *The European Journal of Public Health*, 23(5), 727-731.
9. Sakellaropoulos, S. (2019). *Greece's (un) competitive capitalism and the economic crisis*. Springer International Publishing.
10. Economou, M., Madianos, M., Peppou, L. E., Patelakis, A., & Stefanis, C. N. (2013). Major depression in the era of economic crisis: a replication of a cross-sectional study across Greece. *Journal of affective disorders*, 145(3), 308-314.
11. Madianos, M., Economou, M., Alexiou, T., & Stefanis, C. (2011). Depression and economic hardship across Greece in 2008 and 2009: two cross-sectional surveys nationwide. *Social psychiatry and psychiatric epidemiology*, 46(10), 943-952.
12. Economou, M., Madianos, M., Peppou, L. E., Theleritis, C., Patelakis, A., & Stefanis, C. (2013). Suicidal ideation and reported suicide attempts in Greece during the economic crisis. *World Psychiatry*, 12(1), 53-59.
13. Madianos, M. G., Alexiou, T., Patelakis, A., & Economou, M. (2014). Suicide, unemployment and other socioeconomic factors: evidence from the economic crisis in Greece. *The European Journal of Psychiatry*, 28(1), 39-49.
14. WHO. (2020c). *Pneumonia of unknown cause – China*. WHO; World Health Organization.
15. WHO. (2020b). *Novel Coronavirus – China*. WHO; World Health Organization.
16. Zhu, N., Zhang, D., Wang, W., Li, X., Yang, B., Song, J., ... & Tan, W. (2020). A novel coronavirus from patients with pneumonia in China, 2019. *New England journal of medicine*.
17. WHO. (2020a). *Coronavirus disease (COVID-2019) situation reports*. WHO.
18. WHO. (2020d). *Rolling updates on coronavirus disease (COVID-19)*. WHO.
19. NPHO. (2021, January 5). *Daily report | CoVid19.gov*. <https://covid19.gov.gr/covid19-live-analytics/>
20. de Medeiros Carvalho, P. M., Moreira, M. M., de Oliveira, M. N. A., Landim, J. M. M., & Neto, M. L. R. (2020). The psychiatric impact of the novel coronavirus outbreak. *Psychiatry research*, 286, 112902.
21. Liu, T. B., Chen, X. Y., Miao, G. D., Zhang, L., Zhang, Q., & Cheung, T. (2003). Recommendations on diagnostic criteria and prevention of SARS-related mental disorders. *J Clin Psychol Med*, 13(3), 188-91.
22. Maunder, R., Hunter, J., Vincent, L., Bennett, J., Peladeau, N., Leszcz, M., ... & Mazzulli, T. (2003). The immediate psychological and occupational impact of the 2003 SARS outbreak in a teaching hospital. *Cmaj*, 168(10), 1245-1251.
23. Xiang, Y. T., Yang, Y., Li, W., Zhang, L., Zhang, Q., Cheung,

- T., & Ng, C. H. (2020). Timely mental health care for the 2019 novel coronavirus outbreak is urgently needed. *The lancet psychiatry*, 7(3), 228-229.
24. Frاسquilho, D., Matos, M. G., Salonna, F., Guerreiro, D., Storti, C. C., Gaspar, T., & Caldas-de-Almeida, J. M. (2015). Mental health outcomes in times of economic recession: a systematic literature review. *BMC public health*, 16(1), 1-40.
  25. Gilbert, P. (1998). What is shame? Some core issues and controversies.
  26. Gilbert P., Body Shame: A Biopsychosocial Conceptualisation and Overview, with Treatment Implications. In P. Gilbert & J. Miles (Eds.). *Body Shame: Conceptualisation, Research and Treatment* (pp. 3-54). London: Routledge, 2002.
  27. Gilbert, P. (2007). The evolution of shame as a marker for relationship security: A biopsychosocial approach.
  28. Tracy, J. L., & Robins, R. W. (2004). "Putting the Self Into Self-Conscious Emotions: A Theoretical Model". *Psychological inquiry*, 15(2), 103-125.
  29. Andrews, B., Qian, M., & Valentine, J. D. (2002). Predicting depressive symptoms with a new measure of shame: The Experience of Shame Scale. *British Journal of Clinical Psychology*, 41(1), 29-42.
  30. De Rubeis, S., & Hollenstein, T. (2009). Individual differences in shame and depressive symptoms during early adolescence. *Personality and individual differences*, 46(4), 477-482.
  31. Celano, C. M., Daunis, D. J., Lokko, H. N., Campbell, K. A., & Huffman, J. C. (2016). Anxiety disorders and cardiovascular disease. *Current psychiatry reports*, 18(11), 1-11.
  32. Sandrini, L., Ieraci, A., Amadio, P., Zarà, M., & Barbieri, S. S. (2020). Impact of Acute and Chronic Stress on Thrombosis in Healthy Individuals and Cardiovascular Disease Patients. *International journal of molecular sciences*, 21(21), 7818.
  33. Moitra, E., Dyck, I., Beard, C., Bjornsson, A. S., Sibrava, N. J., Weisberg, R. B., & Keller, M. B. (2011). Impact of stressful life events on the course of panic disorder in adults. *Journal of affective disorders*, 134(1-3), 373-376.
  34. Gouva, M., Kaltsouda, A., Paschou, A., Dragioti, E., Kotrotsiou, S., Mantzoukas, S., & Kotrotsiou, E. (2016). Reliability and Validity of the Greek Version of the Experience of Shame Scale (ESS). *Interscientific health care*, 8(4).
  35. Goss, K., Gilbert, P., & Allan, S. (1994). An exploration of shame measures—I: The other as Shamer scale. *Personality and Individual differences*, 17(5), 713-717.
  36. Gouva, M., Paschou, A., Kaltsouda, A., Dragioti, E., Paralikas, T., Mantzoukas, S., & Kotrotsiou, E. (2016). Psychometric properties and factor structure of the Greek version of the Other As Shamer Scale (OAS). *Interscientific health care*, 8(4).
  37. Kline, R. B. (2015). *Principles and practice of structural equation modeling*. Guilford publications.
  38. Satorra, A. (2000). Scaled and adjusted restricted tests in multi-sample analysis of moment structures. In *Innovations in multivariate statistical analysis* (pp. 233-247). Springer, Boston, MA.
  39. [https://cir.nii.ac.jp/crid/1574231874043578752Team,%20R.%20C.%20\(2013\).%20R:%20A%20language%20and%20environment%20for%20statistical%20computing.%20R%20Foundation%20for%20Statistical%20Computing,%20Vienna,%20Austria.%20http://www.%20R-project.%20org/](https://cir.nii.ac.jp/crid/1574231874043578752Team,%20R.%20C.%20(2013).%20R:%20A%20language%20and%20environment%20for%20statistical%20computing.%20R%20Foundation%20for%20Statistical%20Computing,%20Vienna,%20Austria.%20http://www.%20R-project.%20org/)
  40. Rosseel, Y. (2012). lavaan: An R package for structural equation modeling. *Journal of statistical software*, 48, 1-36.
  41. Kessler, R. C., McGonagle, K. A., Zhao, S., Nelson, C. B., Hughes, M., Eshleman, S., ... & Kendler, K. S. (1994). Lifetime and 12-month prevalence of DSM-III-R psychiatric disorders in the United States: results from the National Comorbidity Survey. *Archives of general psychiatry*, 51(1), 8-19.
  42. Fleet, R. P., Dupuis, G., Marchand, A., Burelle, D., & Beitman, B. D. (1994). Panic disorder, chest pain and coronary artery disease: literature review. *The Canadian Journal of Cardiology*, 10(8), 827-834.
  43. Kessler, R. C., Chiu, W. T., Jin, R., Ruscio, A. M., Shear, K., & Walters, E. E. (2006). The epidemiology of panic attacks, panic disorder, and agoraphobia in the National Comorbidity Survey Replication. *Archives of general psychiatry*, 63(4), 415-424.
  44. Tangney, J. P. (1995). Recent advances in the empirical study of shame and guilt. *American Behavioral Scientist*, 38(8), 1132-1145.
  45. Montgomery, C. (2006). The virtue of depression in the secret life of shame: A group-analytic perspective. *Group Analysis*, 39(1), 73-85.
  46. Katerndahl, D. A. (2008). The association between panic disorder and coronary artery disease among primary care patients presenting with chest pain: an updated literature review. *Primary care companion to the Journal of clinical psychiatry*, 10(4), 276.
  47. Orth, U., Robins, R. W., & Soto, C. J. (2010). Tracking the trajectory of shame, guilt, and pride across the life span. *Journal of personality and social psychology*, 99(6), 1061.
  48. Ngo, E. B. (2001). When disasters and age collide: Reviewing vulnerability of the elderly. *Natural Hazards Review*, 2(2), 80-89.
  49. Rodríguez-Rey, R., Garrido-Hernansaiz, H., & Collado, S. (2020). Psychological impact and associated factors during the initial stage of the coronavirus (COVID-19) pandemic among the general population in Spain. *Frontiers in psychology*, 11, 1540.
  50. Yazdanyar, A., & Newman, A. B. (2009). The burden of cardiovascular disease in the elderly: morbidity, mortality, and costs. *Clinics in geriatric medicine*, 25(4), 563-577.
  51. North, B. J., & Sinclair, D. A. (2012). The intersection between aging and cardiovascular disease. *Circulation research*, 110(8), 1097-1108.
  52. Wardenaar, K. J., Lim, C. C., Al-Hamzawi, A. O., Alonso, J., Andrade, L. H., Benjet, C. D., ... & De Jonge, P. (2017). The cross-national epidemiology of specific phobia in the World Mental Health Surveys. *Psychological medicine*, 47(10), 1744-1760.

53. Maas, A. H., & Appelman, Y. E. (2010). Gender differences in coronary heart disease. *Netherlands heart journal : monthly journal of the Netherlands Society of Cardiology and the Netherlands Heart Foundation*, 18(12), 598-602.
54. Arora, S., Stouffer, G. A., Kucharska-Newton, A. M., Qamar, A., Vaduganathan, M., Pandey, A., ... & Caughey, M. C. (2019). Twenty year trends and sex differences in young adults hospitalized with acute myocardial infarction: the ARIC Community Surveillance Study. *Circulation*, 139(8), 1047-1056.
55. Frank, E. (Ed.). (2008). *Gender and its effects on psychopathology*. American Psychiatric Pub.
56. Liu, N., Zhang, F., Wei, C., Jia, Y., Shang, Z., Sun, L., ... & Liu, W. (2020). Prevalence and predictors of PTSS during COVID-19 outbreak in China hardest-hit areas: Gender differences matter. *Psychiatry research*, 287, 112921.
57. Sun, L., Sun, Z., Wu, L., Zhu, Z., Zhang, F., Shang, Z., ... & Liu, W. (2020). Prevalence and risk factors of acute post-traumatic stress symptoms during the COVID-19 outbreak in Wuhan, China. *MedRxiv*, 10(2020.03), 06-20032425.
58. Kim, S., Thibodeau, R., & Jorgensen, R. S. (2011). Shame, guilt, and depressive symptoms: a meta-analytic review. *Psychological bulletin*, 137(1), 68.
59. Cavallera, C. (2020). COVID-19 psychological implications: The role of shame and guilt. *Frontiers in Psychology*, 11, 571828.
60. Gilbert, P. (2016). *Depression: The evolution of powerlessness*. Routledge.
61. Gilbert, P. (2000). The relationship of shame, social anxiety and depression: The role of the evaluation of social rank. *Clinical Psychology & Psychotherapy: An International Journal of Theory & Practice*, 7(3), 174-189.
62. Gilbert, P. (2003). Evolution, social roles, and the differences in shame and guilt. *Social Research: An International Quarterly*, 70(4), 1205-1230.

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