Translation and Psychometric Properties of the Occupational Stress Questionnaire (OSQ) in a sample of Greek workers

Corresponding Author

Vasiliki-Maria Tsopoki

National & Kapodistrian University of Athens, Faculty of Nursing, Department of Public Health, Laboratory of Prevention, Papadiamantopoulou 123, P.C. 11527, Goudi, Athens, Greece, e-mail: valiatsopoki@gmail.com; tsopokivalia@med.uoa.gr, mob. phone: +306934645545, fax number: 2107461475.

Co-authors

Elpiniki Laiou

Teaching Fellow, University of Ioannina, Department of Nursing, Ioannina, Greece.

Styliani Tziaferi

Assistant Professor, University of Peloponnese, Department of Nursing, Laboratory of Integrated Health Care, Sparta, Greece.

Emmanouil Velonakis

Professor, National & Kapodistrian University of Athens, Faculty of Nursing, Department of Public Health, Laboratory of Prevention, Athens, Greece.

Panayota Sourtzi

Professor, National & Kapodistrian University of Athens, Faculty of Nursing, Department of Public Health, Laboratory of Prevention, Athens, Greece.

Translation and Psychometric Properties of the Occupational Stress Questionnaire (OSQ) in a sample of Greek workers

Abstract

Background: Interactions between the financial crisis in Greece and workers' occupational stress may lead to adverse health effects. The Occupational Stress Questionnaire (OSQ) is a 4-dimensions and 7-subscales tool, developed by the Finnish Institute of Occupational Health, to measure occupational stress.

Objective: To translate, culturally adapt and validate OSQ in the Greek workforce, in order to measure occupational stress among employees, during the financial crisis.

Methods: A standardized forward backward translation was performed. Reliability, stability, construct validity and internal consistency were evaluated in a sample of 604 employees during a 2-years study. Statistical analysis was performed using SPSS 21.0 for Windows.

Results: OSQ demonstrated good acceptability, with missing items below 10% for all dimensions and subscales. Cronbach's alpha coefficients for all dimensions and the global score ranged from 0.71 to 0.89, indicating good internal consistency reliability. All dimensions demonstrated high stability in 2-weeks interval, with values of Spearman's r above 0.73. OSQ scores were higher among single employees ($p<0.01$), affected by the crisis ($p=0.003$), with an adaptable work schedule ($p=0.012$), absent for more than sixteen days the current year ($p<0.01$) and working for their employers one to five years ($p<0.01$). OSQ score was significantly lower among employees working the typical forty hours per week ($p<0.01$).

Conclusions: The Greek version of OSQ is a reliable and valid instrument, nevertheless additional items could improve subscales' internal consistency. Employees affected by the financial crisis and employment conditions reforms are at high risk for occupational stress and further studies are needed to investigate possible adverse effects on health.

Key words: Occupational stress, work-related stress, psychometric properties, Greece, OSQ.

Translation and Psychometric Properties of the Occupational Stress Questionnaire (OSQ) in a sample of Greek workers

1. Introduction

Occupational stress is the main psychosocial risk in the contemporary workplace [1]. It is related to the way employees use to cope with a wide range of work circumstances, including their job demands, especially in the case where these demands are considered incompatible with the available resources and the workers' background, such as skills and knowledge [2]. The subjectivity of the reactions of individuals to a variety of stressful work conditions has led to the development of several models, which aim to address the dimensions of occupational stress, using a structured approach. The most commonly applied models include the "person-environment fit model" [3], which focuses on the compatibility between the employee and the environment; the "demand-control model" [4], which emphasizes in the importance of work control; the "high effort and low reward model" [5], which postulates that a combination of high effort and low reward can lead to adverse health effects; the "job demands resources model" [6], which suggests that the workplace demands interact with the resources available and the "organizational justice model" [7], which focuses on the extent to which employees receive just treatment at the workplace. These models establish specific factors and dimensions of occupational stress, which can affect an individual in a variety of ways.

With regards to psychosocial work exposures, significant differences exist within Europe [8], where the highest prevalence of stress is met in the countries of the South, confirming that the psychosocial risks at work, such as occupational stress, affect the employees in each country in a different degree of intensity and frequency. Work related stress has been reported to be experienced by 55% of the workforce in Greece, while in Europe it has been reported by 22% of the workforce on average, slightly more frequently by men [9]. The possible interactions between occupational stress and the increasing trend in fair and poor self-reported health observed over the last years, as an adverse effect of the financial crisis [10], could prove to be harmful for the working population of Greece and of Europe.

It is well established that occupational stress has an adverse effect on several health outcomes, such as increased risk of metabolic syndrome [11,12], high frequency of occupational injuries [13], high risk of hypertension, type 2 diabetes mellitus and dyslipidemia [14], high risk of developing acute coronary syndromes [15,16], poor quality of working life [17], poor mental health [18], high incidence of musculoskeletal disorders in the lower extremities [19] and both high frequency of absenteeism [20] and presenteeism [21].

In workplaces where structural reforms have been applied, as a response to economic issues, higher levels of work intensity in terms of workload, work pressure and job demands have been reported [22]. Given the fact that employees in Greece have been facing the consequences of the current financial crisis since 2008 [23], occupational stress in the content of the crisis is considered to be one of the biggest challenges that occupational health professionals are called to manage in the workplace.

The Occupational Stress Questionnaire

The Occupational Stress Questionnaire (OSQ) is a survey tool for occupational health professionals, developed by the Finish Institute of Occupational Health (FIOH) to measure the level of work-related stress among employees. OSQ was published as an official instrument of FIOH, in 1992 and was available in Finnish, Swedish, Italian and English, [24]. It is based on a model which supports that the perception of control and social support that an employee has defines, to a significant degree, the interactions that occur between the external and the perceived environment, as well as the levels of stress and satisfaction [25]. The questionnaire evaluates the psychological work environment and the developmental needs, by involving the respondents in a feedback discussion for the initiation of improvements towards stress-reduction.

The aim of the present study was to translate, culturally adapt and validate the OSQ in employees in Greece, in order to determine the prevalence of occupational stress in the workforce during the financial crisis.

2. Methods

2.1 Translation

A translation team and an expert committee were established to translate into Greek and culturally adapt the OSQ for use in Greece, following written permission from the FIOH. In this paper, we document the translation, the cultural adaptation and the results of the initial testing of the Greek version. We describe the process in chronological order, emphasizing the importance of the fact that translation, evaluation (both qualitative and quantitative) and revision were done iteratively.

The development of the Greek version involved six phases [26] that led to the Greek OSQ version 1.2.

Phase 1: Initial translations (English to Greek)

Two forward translations were made from English to Greek. Working separately, translators T1 and T2 produced independently of each other two initial Greek versions of the OSQ, along with a written report, explaining their choices for wordings that contained a degree of uncertainty. Both translators were bilingual, with Greek as their first language, and both had an occupational health background.

Phase 2: Synthesis for Version 1.0

The configuration of Version 1.0 came as the result of the synthesis of the original questionnaire and both the two initial Greek translations. T1 and T2 were involved in this synthesis, which included a comparison between the two translations, produced during the previous phase, focusing on any translation discrepancies. The progress towards Version 1.0 was reported in written, although no major nonconformity arose.

Phase 3: Backward translations

Two translators, T3 and T4, independently produced two backward translations of Version 1.0 into English, having no access to the original version of the OSQ. Both

translators were bilingual and one had a medical background. The objective of these backward translations was to preserve the item content of the original version.

Phase 4: Expert committee review

An expert committee, comprised of three health professionals, evaluated the two backward translations and compared them with the original English version. This phase resulted in version 1.1, a pre-final version of the Greek translation of OSQ. The progress towards version 1.1 was reported in written, including all alternative wordings in cases of debating translation phrases.

Phase 5: Test of the pre-final version

Version 1.1 of the questionnaire was tested on 50 employees from 6 different workplaces in Greece. Each subject self-completed the OSQ version 1.1 and was questioned about any difficulties encountered in completing the questionnaire or understanding the purpose or meaning of each question. Following the interview process, the expert committee discussed the findings and proposed the final version.

Phase 6: Final version

Version 1.2, the final version of the OSQ questionnaire, was established.

2.2 Validation

The validation study took place throughout 2012-2014 and involved a convenience sample of employees living and working in Greece. Participants were selected according to social and demographic characteristics, ensuring the representativeness of the sample for the workforce of Greece.

OSQ has a structured form, that includes an initial section of demographic items, under the theme of "personal background" and a section that measures occupational stress as the combination of four dimensions; "modifying factors and resources at work",

"perceived environment", "stress and wellbeing" and "need for support and interventions". Furthermore, two dimensions include subscales; the "*job control*", "*social relations and esteem*", "*workplace atmosphere*" and "*leadership and supervision*" subscales constitute the dimension of the "modifying factors and resources at work", whereas the "*work demands*", "*hazards and environment*" and "*work strain*" subscales constitute the dimension of the "perceived environment". Along with the demographic items, a question regarding the degree to which employees feel affected by the financial crisis was added, in order to capture and assess the possible influence of the current crisis-driven conditions on the workforce. The scores for each item of the subscales and dimensions can be used to compute the total score of occupational stress.

The questionnaire was self-administered, aiming for an optimal sense of confidentiality among participants, which would facilitate their volition for sincere responses. The responses to the items of the OSQ were coded, recoded where applicable, and finally transformed into seven subscale scores, four dimension scores and the total OSQ score, ranging from 0 (lowest level of occupational stress) to 5 (highest level of occupational stress).

The Greek OSQ version 1.2 went through internal consistency reliability testing, utilizing a convenience sample of employees. The normality of the distribution of the data was determined visually as well as through the Shapiro- Wilk normality test, according to which parametric statistical tests were used. Internal consistency was measured using Cronbach's α coefficient. Stability was evaluated using the test-retest reliability technique, with a 2-weeks interval between the first and the second response. Bivariate analysis was performed using the t-test for comparisons between two groups and the one-way Anova for comparisons between multiple groups. Construct validity was assessed using a multitrait-multimethod matrix. Inter-scale correlations of the four OSQ dimensions were assessed using the Spearman correlation coefficient. Statistical analysis was performed using SPSS 21.0 for Windows.

3. Results

The study population consisted of 604 out of 815 employees (response rate 74.11%) of 34 random companies. Participant mean age was 42 years old and 65.5% of the

responders were men. The occupational characteristics of the study participants are presented in Table 1.

Table 1. Occupational characteristics of the study sample (N=604)

Variable	N	%	Mean age	% men	% women
Years in company					
< 1	47	8	32.9	66	34
1 to 5	126	21.6	35.8	71.4	28.6
5 to 10	127	21.7	38.5	54	46
>10	284	48.6	49	66.5	33.4
Weekly working hours					
<40	55	9.1	35.6	35.2	64.8
40	331	54.8	45.5	73.3	26.7
≥40	201	33.3	39.5	60.7	39.3
Work schedule					
Standard morning shift	436	72.9	43.3	66.4	33.6
Standard evening shift	10	1.7	41.2	70	30
Rotating shift	54	9	40.7	66.8	35.2
Split shift	13	2.2	42.4	69.2	30.8
Adaptable to requirements	85	14.2	39.5	60.7	39.3
Absenteeism					

0 days	391	66.3	43.8	71.4	28.6
1-3 days	108	18.3	38.1	51.8	48.1
4-10 days	60	10.2	41.2	53.3	46.7
11-15 days	10	1.7	44.1	70	30
>16 days	21	3.6	42.9	52.4	47.6
Type of contract					
Permanent	514	85.8	43.3	63.1	36.9
Temporary	85	14.2	37.4	80.9	19.1
Type of job					
White collar worker	437	76.8	42.7	57.6	42.4
Blue collar worker	132	23.2	41.7	90.8	9.2

The vast majority of the sample (91.2%) completed all the questionnaire items, thus the proportion of subjects with missing items was below 10% for all dimensions and subscales. Not all observed score ranges coincided with the theoretical range (1-5). Cronbach's α coefficients for the four dimensions of occupational stress were above 0.70, nevertheless this did not apply to all seven subscales; for subscales which are defined by five or less items, such as "*job control*", "*social relations and esteem*", "*workplace atmosphere*" and "*work strain*", Cronbach's α coefficients was below 0.70, with the exception of the "*hazards and environment*" subscale.

The dimension with the highest mean score was "perceived environment", which includes the subscale of "*work strain"*, which also had the highest score among all subscales.

Table 2. Distribution and reliability of the OSQ in a population sample of 604 workers (Greece, 2012- 2014)

OSQ dimensions and subscales	Number of items	Mean score	SD	Missing items (%)	Observed range	Cronbach's α
Modifying factors/ resources at work	19	2.2	0.4	4.8	1.27 - 3.73	0.88
Job control	4	2.6	0.7	2.6	1 – 4.75	0.66
Social relations and esteem	5	1.9	0.5	1.5	1 – 3.6	0.65
Workplace atmosphere	3	2.5	0.5	2.8	1 - 4	0.52
Leadership and supervision	7	2	0.7	2.6	1 – 4.71	0.88
Perceived environment	15	2,7	0.6	4.8	1.19 – 4.63	0.76
Work demands	9	2.6	0.5	3.6	1.3 – 4.4	0.74
Hazards and environment	4	2.2	0.9	2.6	1 - 5	0.79
Work strain	2	3.4	0.9	2.3	1 - 5	0.07
Stress and wellbeing	7	2.2	0.6	2.64	1 - 4	0.78
Need for support and interventions	8	2.3	0.6	2.9	1 – 4	0.71

OSQ score	49	2.3	0.4	8.77	1.27 – 3.37	0.89

The correlations between the 2 weeks interval responses in the items of the OSQ are presented in Table 3. Spearman's r values for the dimensions and subscales range from 0.579 for the sub-scale "*workplace atmosphere*" ($p<0.001$) to 0.921 for the "*leadership and supervision*" sub-scale ($p<0.001$).

Table 3. Test-retest reliability of the OSQ in a subsample of 50 workers (Greece, 2012- 2014)

OSQ dimensions and subscales	Spearman's r	p-value
Modifying factors/ resources at work	0.902	<0.001
Job control	0.722	<0.001
Social relations and esteem	0.795	<0.001
Workplace atmosphere	0.579	<0.001
Leadership and supervision	0.921	<0.001
Perceived environment	0.897	<0.001
Work demands	0.859	<0.001
Hazards and environment	0.874	<0.001
Work strain	0.796	<0.001
Stress and wellbeing	0.733	<0.001
Need for support and interventions	0.792	<0.001

OSQ score patterns among employee subgroups are shown in Table 4. The mean OSQ score was the same among men and women (2.23), but higher among singles (2.41) than all other marital status subgroups ($p<0.01$) and higher among those who feel affected by the crisis due to their jobs (2.33) or other reasons (2.21) than those who haven't felt affected at all (2.13) or the company they work for has been affected without any individual impact (2.12) ($p<0.05$). In addition, the mean OSQ score was higher in those who adapt their work schedule according to the company's requirements (2.44) than those who have a standard morning (2.27), evening (2.31), rotating (2.35) or split shift (2.34) ($p<0.01$) and higher among those who were absent due to health issues for more than sixteen days during the current year (2.62) than all other subgroups ($p<0.01$). Finally, the mean OSQ score was higher among employees working for their employer for one to five (2.41) and five to ten years (2.33) than those working for less than a year (2.27) or more than ten years (2.23) ($p<0.01$) and lower among those working the typical forty hours per week (2.23) than those working more (2.39) or less (2.36) than forty hours per week ($p<0.01$). No statistically significant differences on OSQ mean scores were found among white or blue collar workers, young or older participants and permanent or temporary employees.

Table 4. Mean OSQ scores (N=604) according to personal and occupational characteristics (Greece, 2012-2014).

Personal and Occupational Characteristic	OSQ mean score	p-value
Weekly working hours		
>40	2.3859	<0.001
40	2.2326	
<40	2.3589	
Years in company		
>10	2.2324	<0.001

5-10	2.3264	
1-5	2.4139	
<1	2.2676	
Marrital status		
Widow/ Widower	2.1973	<0.001
Single	2.4097	
Divorced	2.3009	
Married	2.2408	
Sex		
Men	2.2981	0.941
Women	2.3006	
Absenteism this year in days		
>16	2.6176	<0.001
11-15	2.2388	
4-10	2.3962	
1-3	2.4025	
0	2.2387	
Type of job		
Blue collar	2.3165	0.505
White collar	2.2886	
Work schedule		

Adaptable to requirements	2.4378	0.012
Split shift	2.3395	
Rotating shift	2.3508	
Standard evening shift	2.3122	
Standar morning shift	2.2675	
Age		
<30	2.3818	0.602
>30	2.2793	
Type of contract		
Temporary	2.3785	0.063
Permanent	2.2870	
Affected by crisis		
Yes, due to my job	2.3319	0.003
Yes, not due to my job	2.2149	
Only my company	2.1224	
Not at all	2.1293	

The multitrait- multimethod matrix of comparisons is shown in Table 5. Inter-scale correlations of the four dimensions were all positive and low to moderate (0.03-0.61). Correlations between the total OSQ score and the questionnaire dimensions were substantial for three of the four dimensions (0.59- 0.85).

Table 5. Spearman correlation coefficients: multitrait- multimethod matrix of the Greek version of the OSQ in a population sample of 604 workers (Greece, 2012-2014)

	MF-RW	PE	SW	NSI	OSQ
Modifying factors- Resources at work (MF-RW)	0.88^{α}				
Perceived environment (PE)	0.34^{**}	0.76^{α}			
Stress and wellbeing (SW)	0.61^{**}	0.34^{**}	0.78^{α}		
Need for support and interventions (NSI)	0.04	0.16^{**}	0.03	0.71^{α}	
OSQ score	0.85^{**}	0.59^{**}	0.74^{**}	0.11^{**}	0.89^{α}

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

* Correlation is significant at the 0.05 level (2-tailed).

$^{\alpha}$ Cronbach's α for the corresponding dimension

4. Discussion

For the purpose of having a reliable tool for measuring occupational stress among employees in Greece, the Occupational Stress Questionnaire (OSQ) [24], a 4-dimensions and 7-subscales tool, that facilitates the report of employee needs with respect to stress reduction interventions in the workplace, was translated, culturally adapted and validated. The results of this study support that the Greek version of the OSQ is a reliable and valid instrument, given the good internal consistency reliability and stability of the tool.

The devolution of the Greek version of the OSQ was unhampered, as the consensus of the syntheses of the independent translations, two forward and two backward ones, was reached effortlessly and the compliance with the conceptual content of the original version of OSQ was confirmed through the testing of the pre-final version. The outcomes of these processes suggest that the OSQ is a survey tool which can successfully be applied in Greece for occupational health research purposes.

Following the translation, the psychometric properties of the Greek version of OSQ were evaluated, using a representative of the crisis-hit Greek workforce [27] sample of 604 employees. The notably high level of data completion indicates good acceptability of the self-administered Greek version. The homogeneity of the scale was assessed with Cronbach's alpha coefficient and the high values of Cronbach's alpha with regard to the four occupational stress dimensions indicate that "modifying factors- resources at work", "perceived environment", "stress and wellbeing" and "need for support and interventions" are internally consistent.

However, not all seven subscales demonstrated high values of Cronbach's alpha; "*leadership and supervision*", "*work demands*" and "*hazards and environment*" had Cronbach's α coefficients above 0.7, but "*job control*", "s*ocial relations and esteem*", "*workplace atmosphere*" and especially "*work strain*" had values below 0.7, denoting that additional questionnaire items would need to be included if the use of these subscales is considered anciallary or essential for future research. This applies especially in the case of the "*work strain*" subscale, which is assessed by only two questions. Nevertheless, the high value of Cronbach's α of the total OSQ score suggests a high level of reliability of the Greek OSQ.

Moreover, scale stability was evaluated with the test-retest technique, evaluating the correlations between the two-weeks interval responses to the OSQ. All four dimensions and six out of seven subscales demonstrated high stability, with values of Spearman's r, for the scores taken in a 2-weeks interval, being above 0.70. The "*workplace atmosphere*" subscale had a relatively to the other subscales and dimensions lower stability, nevertheless the relationships that affect the atmosphere in the workplace is a vulnerable to change factor [28] and accordingly the stability index for the subscale was considered to be satisfying. Given that workplace conditions that potentially affect a worker's occupational stress level are in general affected quite easily [29], the results

of the test-retest reliability support the high level of response stability of the OSQ as a survey tool.

It is worth mentioning that- to our knowledge- reliability and validity studies of the available versions of OSQ, as an integrated tool, have not been published yet, nevertheless our results are compatible with the satisfactory values of indexes based on factor analysis (0.58-0.93) that was performed on the dimensions and subscales of the original questionnaire [25].

In this study, "perceived environment" as a dimension and "*work strain*" as a subscale of occupational stress presented the highest scores, intimating that the labor market reforms and adjustments resulting from the economic recession in Greece [30] have affected not only the unemployment rates, which since 2012 remain at high levels [31], but also the employment conditions in terms of workload for the workers remained employed, who have been reported to hold the first place regarding labor market precariousness and the second place regarding job strain among all OECD countries [32]. The lowest values, on the other hand, were observed in the subscale of "*social relations and esteem*", suggesting that satisfactory supportive relations between co-workers prevail in the Greek workplace and that occupational activities are appraised from the point of the worker's families and the community in general.

The levels of occupational stress that the study population demonstrated through the Greek OSQ were similar to those reported in other studies that refer to the Greek workforce, specifically among bank employees [33], telecommunication employees [34], police officers [35], nurses [36] and teachers [37].

The OSQ score differences, with respect to several variables found in this study, imprint the occupational stress experienced by the Greek workforce during the financial crisis. Higher levels of perceived stress in women than in men, not necessarily work-related, have been previously reported [38] in Greece, nevertheless the levels of occupational stress in this study did not differ between male and female employees. Furthermore, employees who are single, absent due to health issues for more than sixteen days during the current year, working for the same employer for more than one and less than ten years.

Regarding the employment related factors, occupational stress was found to be higher among employees having a work schedule that in not standard but adapts according to the company's requirements and lower among those working for 40 hours per week, in comparison with all other subgroups. The present study also poses the current financial crisis as a statistically significant factor that affects occupational stress, a well known health determinant [39]. Studies have already shown that modifications in employment conditions and structural reforms that result from the wider instability caused by the financial crisis affect the levels of work-related stress [40, 41, 42] as well as personal and work-related burnout [43]. Further studies in Greece are needed to assess the possibility of an adverse impact of the crisis on perceived health.

Regarding the limitations of the study, immigrant employees were excluded from the study population, due to the fact that the OSQ was self-administered, thus, employees who had not mastered the Greek language would not have been able to participate. Due to the study design, workers without a contract and dependent self-employed workers were also not included, although they constitute an important part of the Greek workforce [44].

In conclusion, this was the first study to evaluate occupational stress during the Greek financial crisis among a representative sample of the workforce. The results of the psychometric properties evaluation indicate that the Greek version of the OSQ retains the characteristics of the English original, it can provide a standardized measure of worker perceptions regarding the stress factors pertaining to their work and is appropriate for application in the workforce of Greece. Future cross-national comparisons of occupational stress between countries affected on a different degree by the financial crisis would be particularly useful for understanding the effects of the crisis on the quality of life of employees in Greece as well as globally.

Conflict of interest

The authors have no conflict of interest or disclosures pertaining to this manuscript.

References

[1] CSDH, “Closing the gap in a generation: health equity through action on the social determinants of health,” Final Report of the Commission on Social Determinants of Health, Geneva, World Health Organization, 2008.

[2] S. Leka, A. Griffiths, T. Cox, “Work Organization and stress: systematic problem approaches for employers, managers and trade union representatives,” World Health Organization, Geneva, 2003, http://www.who.int/iris/handle/10665/42625.

[3] RD. Caplan, “Person-Environment Fit Theory and Organizations: Commensurate Dimensions, Time Perspectives, and Mechanisms,” Journal of Vocational Behavior, vol. 31, no.3, December 1987, pp. 248-267, https://doi.org/10.1016/0001-8791(87)90042-X.

[4] R. Karasek, “Job demands, job decision latitude, and mental strain: Implication for job redesign,” Administrative Science Quarterly, vol. 24, no. 2, June 1979, pp. 285-308, http://doi:10.2307/2392498.

[5] J. Siegrist, R. Peter, A. Junge, P. Cremer, D Seidel D, “Low status control, high effort at work and ischemic heart disease: prospective evidence from blue-collar men,” Social Science and Medicine, vol. 31, no.10, 1990, pp. 1127-1134.

[6] E. Demerouti, AB. Bakker, F. Nachreiner, WB. Schaufeli, “The job demands-resources model of burnout,” Journal of Applied Psychology, vol. 86, no. 3, June 2001, pp. 499–512.

[7] M. Kivimäki, J. Vahtera, M. Elovainio, M. Virtanen, J. Siegrist, “Effort reward imbalance, procedural injustice and relational injustice as psychosocial predictors of health: complementary or redundant models?,” Occupational and Environmental Medicine, vol. 64, no. 10, October 2007, pp. 659-665.

[8] I. Niedhammer, H. Sultan-Taieb, JF. Chastang, G. Vermeylen, A. Parent-Thirion, “Exposure to psychosocial work factors in 31 European countries,” Occupational Medicine (Oxford, England), vol. 62, no. 3, April 2012, pp. 196-202, http://doi: 10.1093/occmed/kqs020.

[9] European Agency for Safety and Health at Work, “OSH in figures: stress at work-facts and figures,” Office for Official Publications of the European Communities, Luxembourg, 2009.

[10] DS. Abebe, AG. Tøge, E. Dahl, “Individual-level changes in self-rated health before and during the economic crisis in Europe,” International Journal for Equity in Health, vol. 5, no.15, January 2016, pp. 1-8, http://doi: 10.1186/s12939-015-0290-8.

[11] H. Zhao, L. Song, Y. Qiang, HR. Liu, FY. Qiu, XZ. Li, H. Song, “Association between occupational stress and aminotransferase activity in patients with metabolic syndrome,” Chinese journal of industrial hygiene and occupational diseases, vol. 34, no. 12, December 2016, pp. 911-916, http://doi: 10.3760/cma.j.issn.1001-9391.2016.12.007.

[12] RP. Ribeiro, MH. Marziale, JT. Martins, PH. Ribeiro, ML. Robazzi, JC. Dalmas, “Prevalence of Metabolic Syndrome among nursing personnel and its association with occupational stress, anxiety and depression,” Revista latino-americana de enfermagem. vol. 23, no. 3, June 2015, pp. :435-440, http://doi: 10.1590/0104-1169.0383.2573.

[13] X. Liu, Y. Zong, G. Huang, S. Wang, Y. Zhou, Z. Guo, W. Chen, “Association between occupational stress, social support, and occupational unintentional injuries: a case-control study,” Chinese journal of industrial hygiene and occupational diseases, vol. 33, no. 2, February 2015, pp.110-112.

[14] N. Djindjic, J. Jovanovic, B. Djindjic, M. Jovanovic, JJ. Jovanovic, “Associations between the occupational stress index and hypertension, type 2 diabetes mellitus, and lipid disorders in middle-aged men and women,” The annals of occupational hygiene, vol. 56, no. 9, November 2012, pp.1051-1062, http://doi: 10.1093/annhyg/mes059.

[15] M. Kornitzer, P. deSmet, S. Sans, M. Dramaix, C. Boulenguez, G. DeBacker, M. Ferrario, I. Houtman, SO. Isacsson, PO. Ostergren, I. Peres, E. Pelfrene, M. Romon, A. Rosengren, G. Cesana, L. Wilhelmsen, “Job stress and major coronary events: results from the Job Stress, Absenteeism and Coronary Heart Disease in Europe study,” European journal of cardiovascular prevention and rehabilitation : official journal of the European Society of Cardiology, Working Groups on Epidemiology & Prevention

and Cardiac Rehabilitation and Exercise Physiology, vol. 13, no. 5, October 2006, pp. 695-704, http://doi:10.1097/01.hjr.0000221865.19415.e9.

[16] DB. Panagiotakos, C. Chrysohoou, C. Pitsavos, S. Antoniou, E. Vavouranakis, P. Stravopodis, AD. Moraiti, C. Stefanadis, PK. Toutouzas, "The association between occupational stress and the risk of developing acute coronary syndromes: the CARDIO2000 Study," Central European journal of public health, vol. 11, no. 1, March 2003, pp. 25-30.

[17] Q. Zhang, YJ. Lan, HM. Chen, "Association of occupational stress with quality of working life," Journal of Sichuan University. Medical science edition, vol. 42, no. 4, July 2011, pp. 540-543.

[18] WQ. Chen, TW. Wong, TS. Yu, "Influence of occupational stress on mental health among Chinese off-shore oil workers," Scandinavian journal of public health, vol. 37, no. 7, September 2009, pp. 766-773, http://doi: 10.1177/1403494809341097.

[19] SF. Yu, GZ. Gu, WH. Zhou, HS. Wang, SY Sun, XF. Yang, SY Zhou, "Association between occupational stress and musculoskeletal disorders in lower extremity," Chinese journal of industrial hygiene and occupational diseases, vol. 29, no. 12, December 2001, pp. 882-886.

[20] M. Virtanen, J. Vahtera, J. Pentti, T. Honkonen, M. Elovainio, M. Kivimäki, "Job strain and psychologic distress influence on sickness absence among Finnish employees," American journal of preventive medicine, vol. 33, no. 3, September 2007, pp. 182-187, http://doi:10.1016/j.amepre.2007.05.003.

[21] SH. Jeon, JH. Leem, SG. Park, YS. Heo, BJ. Lee, SH. Moon, DY. Jung, HC. Kim, "Association among Working Hours, Occupational Stress, and Presenteeism among Wage Workers: Results from the Second Korean Working Conditions Survey," Annals of occupational and environmental medicine, vol. 26, no. 6, March 2014, http://doi: 10.1186/2052-4374-26-6.

[22] European Foundation for the Improvement of Living and Working Conditions, "Impact of the crisis on working conditions in Europe," Eurofound 2013,

https://www.eurofound.europa.eu/da/publications/report/2013/impact-of-the-crisis-on-working-conditions-in-europe.

[23] A. Kentikelenis, M. Karanikolos, I. Papanicolas, S. Basu, M. McKee, D. Stuckler, "Health effects of financial crisis: omens of a Greek tragedy," Lancet (London, England), vol. 378, no. 9801, October 2011, pp. 1457-1458, http://doi: 10.1016/S0140-6736(11)61556-0.

[24] AL. Elo, A. Leppänen, K. Lindström, T. Ropponen, "OSQ—Occupational Stress Questionnaire: user's instructions," Reviews/ Institute of Occupational Health, no. 19, Helsinki: Finnish Institute of Occupational Health, 1992.

[25] K. Lindstrom, V. Borg, M. Dallner, AN. Elo, F. Gamberale, S. Knardahl, E. Orhede, P. Raivola, "Measurement of Psychological and Social Factors at Work," Nordic Council of Ministers, Copenhagen 1995, pp. 84-86.

[26] DE. Beaton, C. Bombardier, F. Guillemin F, MB. Ferraz, "Guidelines for the process of cross-cultural adaptation of self-report measures," Spine, vol. 25, no. 24, December 2000, pp. 3186-3191.

[27] OECD, "Labour Force Statistics: Summary tables," OECD Employment and Labour Market Statistics (database), 2018, http://doi.org/10.1787/data-00286-en.

[28] Y. Brunetto, M. Xerri, A. Shriberg, R. Farr-Wharton, K. Shacklock, S. Newman, J. Dienger, "The impact of workplace relationships on engagement, well-being, commitment and turnover for nurses in Australia and the USA," Journal of advanced nursing, vol. 69, no. 12, December 2013, pp. 2786-2799, http://doi: 10.1111/jan.12165.

[29] National Research Council, "The Changing Nature of Work: Implications for Occupational Analysis," The National Academies Press, 1999, https://doi.org/10.17226/9600.

[30] T. Kosma, E. Papapetrou, G. Pavlou, C. Tsochatzi, P. Zioutou, "Labour market adjustment and labour market reforms in Greece during the crisis: microeconomic evidence from the third wave of the wage dynamics survey," The Bank of Greece Printing Works, June 2017.

[31] OECD, “OECD Employment Outlook 2018,” OECD Publishing, Paris, 2018.

[32] OECD, “How does GREECE compare? OECD Employment Outlook 2017,” OECD Publishing, Paris, June 2017, https://www.oecd.org/greece/Employment-Outlook-Greece-EN.pdf

[33] D. Belias, A. Koustelios, M. Koutiva, E. Zournatzi, “Occupational Stress and Emotional Intelligence among Greek Bank Employees,” International Journal of Human Resource Studies, vol. 3, no. 4, October 2013, pp. 79-101, http://doi:10.5296/ijhrs.v3i4.4372.

[34] L. Lazuras, A. Rodafinos, G. Matsiggos, A. Stamatoulakis, “Perceived occupational stress, affective, and physical well-being among telecommunication employees in Greece,” Social science & medicine, vol. 68, no. 6, March 2009, pp. 1075-1081 http://doi:10.1016/j.socscimed.2008.12.020.

[35] EC. Alexopoulos, V. Palatsidi, X. Tigani, C. Darviri, “Exploring stress levels, job satisfaction, and quality of life in a sample of police officers in Greece,” Safety and health at work, vol. 5, no. 4, December 2014, pp. 210-215, http://doi:10.1016/j.shaw.2014.07.004.

[36] P. Sarafis, E. Rousaki, A. Tsounis, M. Malliarou, L. Lahana, P. Bamidis, D. Niakas, E. Papastavrou, “The impact of occupational stress on nurses' caring behaviors and their health related quality of life,” BMC Nursing, vol. 15, no. 56, September 2016, pp. 15-56, http://doi:10.1186/s12912-016-0178-y.

[37] N. Kourmousi, C. Darviri, L. Varvogli, EC. Alexopoulos, “Teacher Stress Inventory: validation of the Greek version and perceived stress levels among 3,447 educators,” Psychology research and behavior management, vol. 6, no. 8, March 2015, pp. 81-88, http://doi:10.2147/PRBM.S74752.

[38] E. Andreou, EC. Alexopoulos, C. Lionis, L. Varvogli, C. Gnardellis, GP. Chrousos, C. Darviri, “Perceived Stress Scale: Reliability and Validity Study in Greece,” International Journal of Environmental Research and Public Health, vol. 8, no. 8, August 2011, pp. 3287–3298, http://doi:10.3390/ijerph8083287.

[39] J. Dixon, “Social Determinants of Health,” Health Promotion International, vol. 15, no. 1, March 2000, pp. 87–89, https://doi.org/10.1093/heapro/15.1.87.

[40] G. Giorgi, G. Arcangeli, N. Mucci, V. Cupelli, “Economic stress in the workplace: The impact of fear of the crisis on mental health,” Work, vol. 51, no.1, 2015, pp.135-142, http:// doi:10.3233/WOR-141844.

[41] Á. Snorradóttir, R. Vilhjálmsson, G. Rafnsdóttir, K. Tómasson, “Financial crisis and collapsed banks: psychological distress and work related factors among surviving employees--a nation-wide study,” American journal of industrial medicine, vol. 56, no. 9, September 2013, pp. 1095-1106, http://doi:10.1002/ajim.22210.

[42] CM. Boyd, MR. Tuckey, AH. Winefield, “Perceived effects of organizational downsizing and staff cuts on the stress experience: the role of resources,” Stress and health: journal of the international society for the investigation of stress, vol. 30, no.1, February 2014, pp. 53-64, http://doi:10.1002/smi.2495.

[43] FJ.Tsai, CC. Chan, “The impact of the 2008 financial crisis on psychological work stress among financial workers and lawyers,” International archives of occupational and environmental health, vol. 84, no.4, April 2011, pp. 445-452, http://doi:10.1007/s00420-010-0609-0.

[44] N. Fondeville, E. Ozdemir, O. Lelkes, T. Ward, “Recent changes in self-employment and entrepreneurship across the EU,” Brussels, European Union, December 2015.