
Validation and psychometric properties of the Italian Copenhagen Psychosocial Questionnaire II - short version

Ilaria Setti¹, Angelo d'Errico², Daniela Di Cuonzo^{3,4}, Elena Fiabane^{1,5}, Piergiorgio Argentero¹

¹ Unit of Applied Psychology, Department of Brain and Behavioral Sciences, University of Pavia

² Unit of Epidemiology, Piedmont Region, ASL TO3, Grugliasco

³ Department of Psychology, University of Turin

⁴ Unit of Cancer Epidemiology, "Città della Salute e della Scienza" Hospital and CPO Piemonte, Turin

⁵ Department of Physical and Rehabilitation Medicine, Salvatore Maugeri Foundation, Work and Rehabilitation, IRCCS, Scientific Institute of Genoa

● **ABSTRACT.** Il contributo è finalizzato a fornire una validazione italiana del COPSOQ II - versione breve (*Copenhagen Psychosocial Questionnaire II - short version*; Pejtersen, Kristensen, Borg, & Bjorner, 2010), questionario volto ad indagare alcuni dei principali rischi psico-sociali in ambito lavorativo. L'interesse verso questo strumento deriva dalla numerosità degli aspetti critici considerati e dal suo vasto utilizzo in molti contesti internazionali. Le analisi statistiche, condotte su un vasto campione di lavoratori appartenenti al settore industriale - ed ottenuti tramite EFA, CFA, validità concorrente e discriminante - mostrano buone proprietà psicometriche del questionario. I 4 fattori estratti sono: 1) relazioni con il management, 2) supporto da parte dei superiori, 3) controllo, 4) relazioni tra richieste lavorative e salute. I risultati ottenuti suggeriscono la possibilità di utilizzare il questionario anche nel contesto lavorativo italiano.

● **SUMMARY.** *Introduction: In the current workplace it is important to consider psychosocial risks, as they can lead to negative consequences. The aim of this study is to analyse the psychometric properties of the Italian COPSOQ II - short version, a questionnaire which covers a broad range of psychosocial risks. Methods: The questionnaire was administered to 1,845 industry workers. Information about occupational hazards and health conditions was collected. The psychometric properties of the questionnaire were assessed by means of EFA, CFA, discriminant and concurrent validity. Results: The statistical analyses gave support to the validity of the Italian COPSOQ II. The factorial analyses demonstrated that the 4-factors model had the most reasonable good of fit to the data. Conclusions: The results provide evidence of the validity of the Italian COPSOQ II, that can be used to assess psychosocial risks in the Italian work environment across different economic sectors.*

Keywords: COPSOQ II, Psychosocial factors, Validation

INTRODUCTION

The assessment of psychosocial risk factors is actually a relevant subject since many studies have established that the psychosocial working environment can negatively influence workers' health and organizational outcomes (Backé, Seidler, Latza, Rossnagel & Schumann, 2012; Bernal et al., 2015; Bianchi, Schonfeld & Laurent, 2014; Eurofound, 2016; EU OSHA, 2014; Stansfeld, Shipley, Head & Fuhrer, 2012).

In recent decades, important changes have affected the modern workplaces, such as the increasing globalization and significant demographic changes, such as population ageing (Setti, Dordoni, Piccoli, Bellotto & Argentero 2015). These changes are associated with contractual arrangements, temporary work and, more in general, changes in the workforce (EU OSHA, 2014; Eurofound, 2016). In this framework, both governments and researchers have paid an increasing concern about which effects the new forms of work may have on workers' health. In particular, the interest in studying industry employees' well-being is due to the several risks for their health, especially for those who belong to dangerous sectors, mainly caused by the exposure to physical hazards.

Psycho-social risk factors

Beyond the conventional risk factors, it is also important to consider the risks associated with work organization and management, i.e. psychosocial risks, which can occur in every workplace and negatively affect health and business outcomes (Dollard, Skinner, Tuckey, & Bailey, 2007; EU OSHA, 2014). Furthermore, there is a lack of studies on the health of women workers belonging to the industry sector, even if it has been found that they are likely to develop psychosomatic symptoms and work-life imbalance.

Psychosocial risks at work are defined as aspects of the work design and the organization and management of work, and their social contexts (EU OSHA, 2014). Psychosocial risks are usually assessed through subjective methodologies, since they are mostly determined by the way in which people perceive them. For the individual, the main negative effects of psychosocial risks concern mental disturbances - such as depressive symptoms - and physical illness - such as cardiovascular diseases. Specifically, several studies have previously demonstrated that work stress is a significant risk factor for depression (i.e., Blackmore et al., 2007; Bonde,

2008; Stansfeld et al., 2012; Wang et al., 2015). The main negative organizational effects include, for example, reduced performance, and increased absenteeism and injury rates (Backé et al., 2012; Bianchi et al., 2014).

The assessment of psycho-social risk factors: the Copenhagen Psychosocial Questionnaire (COPSOQ)

A number of self-report questionnaires has been developed in order to assess workplace psychosocial risks, but only some of them have been validated in Italian. A comprehensive questionnaire which covers a broad range of psychosocial work environment stressors and resources, and which is applicable to all types of occupations, is the Copenhagen Psychosocial Questionnaire (COPSOQ; Kristensen, Hannerz, Høgh & Borg, 2005). More recently, a second version of the questionnaire (COPSOQ II; Pejtersen et al., 2010) has been developed. The COPSOQ II includes questions on some new factors, such as Reward, Justice, Trust and Discrimination. Since its validation in Denmark, it has been translated into several languages.¹

The purpose of the present study was to give a first contribution to the validation of the Italian COPSOQ II short version, and to examine its psychometric properties.

METHODS

Study sample and procedure

A survey was targeted to Italian workers employed in 25 companies belonging to the following sectors: mechanics, food production, cleaning, elder and child care, textiles and garment, and trading. All workers were invited to participate in the study and were informed on its goals. Through a structured self-report questionnaire, information about socio-demographics, physical and psychosocial occupational hazards, and health conditions was collected. 1,874 questionnaires were filled in and returned to the research team, together with an informed

¹ Documentation on the different COPSOQ questionnaires and on the construction of the psychosocial scales can be found at: <http://www.arbejdsmiljoforskning.dk/en/publikationer/spoergeskemaer/psykisk-arbejdsmiljoe>

consent form signed by each participant. Participation rate was approximately 50%: 1,845 questionnaires have been used for the analysis (completion rate: 98.5%).

Structure of the COPSOQ II - short version

The English version of the short version of the COPSOQ II questionnaire (Pejtersen et al., 2010) was translated into Italian language by one of the authors and subsequently back-translated in English by another author.

The Italian COPSOQ II consisted of 34 items, 28 of which were combined into 14 scales made of two items, and 2 items were used as single variables; the remaining 4 items were dichotomous and were not considered for the analysis. Items were assessed through Likert scales, ranging from 0 (never/disagree) to 3 or 4 (always/agree). As for other national adaptations of the COPSOQ II (see for example the French version by Dupret, Bocéréan, Teherani, Feltrin & Pejtersen, 2012 and the Spanish version by Moncada et al., 2014), not all the original scales were included in the Italian version. As suggested by Persson and Kristiansen (2012), three scales strongly influenced by current mental health conditions, namely the *Meaning of work*, the *Stress* and the *Commitment to the workplace* scales, were not included in this Italian version. The *Meaning of work* scale was excluded also because of the low test-retest reliability shown in the validation study by Thorsen and Bjorner (2010), as well as its uncertain predictive validity reported by a prospective study on burnout among hospital workers, according to which - and in contrast with expectations - higher perceived meaning of work corresponded to higher levels of burnout (Borritz et al., 2005). The *Stress* scale was not included also because it was quite similar to questions of the General Health Questionnaire-12 (GHQ-12; Ware et al., 1996), which was already present in the main questionnaire. Last, the *Commitment to the workplace* scale - which in the original short version of the COPSOQ questionnaire is intended to capture mainly the affective dimension of the organizational commitment - was not included, since in one study it was largely explained by other psychosocial exposures in the workplace, such as influence at work, role ambiguity and quality of leadership (Clausen & Borg, 2010).

The Italian COPSOQ II - short version, included also 4 dichotomous variables on offensive behaviours (bullying,

sexual harassment, physical violence, threat of violence), which were excluded from the factor analysis after verifying that no model, constructed using such variables, was found that displayed an acceptable fit.

Data analysis

Psychometric properties of the COPSOQ II - short version questionnaire were assessed by the following statistical analyses: exploratory and confirmatory factor analysis, discriminant and concurrent validity.

All the dimensions considered, in the COPSOQ II - short version questionnaire, were assessed through two items, except for job satisfaction and general health (1 item) (Kristensen et al., 2005). For the scales made of two items, a composite scale score was computed as the sum of the two items and factorial analyses were conducted using such composite scale scores. If an item of a scale was missing, the scale score was not computed. To make scale scores comparable, they were normalized to 0-100 scales points. Cronbach's alphas and Pearson's correlation coefficients were computed for each scale to evaluate its internal consistency and correlation of the items within each scale. The factor structure of the Italian COPSOQ II - short version was analysed through SEM (Structural Equation Modelling), using the MPlus statistical software, version 7, in two steps:

- an Exploratory Factor Analysis (EFA) was conducted on a 50% random sample of the study population, stratified by sex, age class and economic sector. EFA was performed with oblique GEOMIN rotation and maximum likelihood extraction. Extending previous work done on COPSOQ-II by Bjorner and Pejtersen (2010) and Dupret et al. (2012), the fit of the data was tested for models from 2 to 6 factors, choosing the most parsimonious model, i.e. that with the least number of factors, which displayed acceptable fit indices (Hu & Bentler, 1998); factor loadings below .32 were not considered and are not shown in the results (Tabachnick & Fidell, 2001);
- a Confirmatory Factor Analysis (CFA) was run on the other half of the sample.

Discriminant validity of the questionnaire was assessed comparing means of the factor scores obtained from the CFA by gender and economic sector, through ANOVA, on the ground that scores of the psychosocial factors obtained should show differences across these groups.

The concurrent validity was assessed through multiple linear regression, using as the dependent variable a depression score, obtained by administering the Personal Health Questionnaire Depression Scale, which is a validated instrument for assessing depressive symptoms (PHQ-9; Kroencke, Spitzer & Williams, 2001)². In these analyses, missing values for the categorical variables (age, gender and economic sector) were kept as a separate category, in order to avoid their exclusion from the analysis.

Both discriminant and concurrent validity were evaluated on the factors obtained from a new 4-factors CFA performed on the whole dataset.

RESULTS

The study population was mainly composed of females (71.2%), with more than half subjects in the mid-age (≥ 40 years). The great majority was blue collars (90%), mainly employed in food production (48%), followed by the textile industry (20%), mechanics (17%), elder and child care (6%), trading (5%) and cleaning (2.7%).

Table 1a reports scale names, number of items, Cronbach's alphas, correlation coefficients between items in each scale, mean scores (standard deviations) and number of missing values. Table 1b shows the frequency distribution of the COPSOQ II "General health" variable in the sample. Internal consistency of the scales was generally high, although six of them did not reach the threshold value of .70 and one - Skill Discretion - was even below .60.

Exploratory factor analysis

Results of the Exploratory Factor Analysis indicated that the goodness of fit started to be satisfying above 3 factors (see Table 2). The 4-factors solution showed satisfactory levels in chi-square test, RMSEA, CFI, TLI and SRMR indices, so it was chosen as the most parsimonious model, including the least number of factors, on which the CFA was conducted.

The analysis allowed identifying the following factors, together with their associated scales (see Table 3):

1. *Relations with Management*: Predictability, Reward, Role

Clarity, Trust, Justice;

2. *Supervisor Support*: Quality of Leadership, Supervisor Support, Job Satisfaction;
3. *Job Control*: Decision Authority, Skill Discretion, Predictability;
4. *Job Demands-Health Interface*: Work Pace, Emotional Demand, Quantitative Demand, Work-Family Conflict, Burnout, Perceived General Health.

Confirmatory factor analysis

In order to obtain a satisfactory model fit, and as indicated by modifications indices, in the CFA one variable, i.e. Predictability, was allowed to load on different factors (*Relations with Management* and *Job Control*).

The results of the CFA demonstrated that the 4-factors model had a reasonable good of fit to the data (see Table 4).

Discriminant validity

The results of the ANOVA indicate that all factors were sufficiently capable of discriminating among genders and different economic sectors (all $p < .01$), with the strongest differences found for *Job Control* and for the *Demand-Health* factor ($p < .0001$) (see Table 5).

Concurrent validity

A multiple regression analysis with PHQ-9 (Kroencke et al., 2001) depression score as the predicted variable and the Italian COPSOQ II - short version factors' scores as independent variables was setup. Only one factor was included in each regression model, as factors were strongly correlated, with the consequence of multicollinearity among them when put together in a single model (see Table 6). Therefore, Table 6 displays the regression coefficient of depression associated with each factor, together with the R squared, p -value and confidence limits of the four regression models, adjusted for age, gender, and economic sector. Depression was significantly associated with all factors in the expected direction (all $p < .001$), with the strongest association and the largest explained variability observed for the *Demand-Health* dimension ($\beta = .142$; $R^2 = .32$).

2 available at: www.sipc.eu/share/pagine/55/PHQ-9.pdf

Table 1a – Summary statistics of the COPSOQ II – short version - variables

COPSOQ continuous scales	N° items (alpha)	Correlation between items (r)	Mean (SD)	Missing values (%)
Quantitative demand	2 (.62)	.45	2.79 (1.98)	120 (6.5)
Work pace	2 (.89)	.81	5.60 (2.06)	68 (3.7)
Emotional demand	2 (.66)	.49	3.08 (2.44)	96 (5.2)
Decision authority	2 (.66)	.50	2.65 (2.36)	94 (5.1)
Skill discretion	2 (.55)	.38	2.76 (2.13)	60 (3.3)
Predictability	2 (.63)	.46	3.22 (2.14)	62 (3.4)
Reward	2 (.70)	.54	2.90 (1.92)	153 (8.3)
Role clarity	2 (.60)	.43	4.81 (1.99)	116 (6.3)
Quality of leadership	2 (.76)	.62	3.44 (2.15)	132 (7.2)
Supervisor support	2 (.83)	.70	3.96 (2.35)	87 (4.7)
Job satisfaction	1	-	1.67 (.78)	70 (3.8)
Work-family conflict	2 (.84)	.72	3.21 (1.87)	66 (3.6)
Trust	2 (.78)	.64	3.75 (1.73)	163 (8.8)
Justice	2 (.74)	.59	3.32 (1.98)	152 (8.2)
Burnout	2 (.81)	.67	4.42 (2.19)	70 (3.8)

Table 1b – Frequency distribution of the “General health” COPSOQ II – short version - variable

General health	N° items	%	Missing values
Very poor		2.71	
Poor		6.47	
Fair	1	55.84	38 (2.1)
Good		28.61	
Very good		6.36	

DISCUSSION

The aim of this study was to provide evidence of the validity of the Italian COPSOQ II - short version with data obtained from a large sample of industry employees. In the last decades, the COPSOQ has become a popular and relevant tool for

both research and preventive practice in the workplace, it was translated in several languages and used in many international studies. As for other countries, also the Italian context may benefit from the diffusion of this instrument in order to measure the psychosocial work environment (Pejtersen et al., 2010). As the French validation (Dupret et al., 2012), we decided to use the

Table 2 – Goodness of fit indices for 2, 3, 4, 5 and 6-factor models from Exploratory Factor Analysis

Model	Chi-square	df	Chi-square p-value	RMSEA	RMSEA 90% CI	CFI	TLI	SRMR
2 factors	703.39	89	<.0001	.087	.081 – .093	.877	.834	.051
3 factors	350.26	75	<.0001	.064	.057 – .070	.945	.912	.029
4 factors	198.65	62	<.0001	.049	.042 – .57	.973	.947	.024
5 factors	127.971	50	<.0001	.041	.033 – .050	.984	.963	.016
6 factors	119.83	39	<.0001	.048	.038 – .058	.984	.950	.016

Table 3 – COPSOQ scales with loadings associated with the 4 factors identified by Exploratory Factor Analysis (loadings factors <.3 not shown)

COPSOQ scales	1-Relations with Management	2-Job Control	3-Supervisor Support	4-Job Demands-Health Interface
Quantitative demand				.305
Predictability	.469	.362		
Reward	.626			
Role clarity	.378			
Trust	.598			
Justice	.766			
Job satisfaction			.335	
Decision authority		.657		
Skill discretion		.785		
Emotional demand				.478
Quality of leadership			.945	
Supervisor support			.574	
Work pace				.447
Work-family conflict				.632
Burnout				.837
Perceived general health				-.465

Table 4 – Goodness of fit indices for the 4-factor model from Confirmatory Factor Analysis

Model	Chi-square	df	Chi-square p-value	RMSEA	RMSEA 90% CI	CFI	TLI	SRMR
CFA	412.380	97	<.0001	.059	.053–.065	.937	.922	.046

Table 5 – Analysis of variance on factor scores by gender and economic sector

Covariates	1 - Relations with Management	2 - Supervisor Support	3 - Job Control	4 - Job Demands-Health interface
Gender				
<i>p</i> -value	.0083	.0114	<.0001	<.0001
R-squared	.004	.004	.039	.017
Economic sector				
<i>p</i> -value	.0011	.0021	<.0001	<.0001
R-squared	.011	.01	.06	.046

Table 6 – Multiple linear regression models of depression with psychosocial factors, adjusted for age class, sex and economic sector ^a

Factors	Beta	R ²	<i>p</i> -value	95% CI
1. Relations with Management	-.090	.15	<.001	-.102 - -.783
2. Supervisor Support	-.091	.15	<.001	-.102 - -.079
3. Job Control	-.048	.06	<.001	-.060 - -.037
4. Job Demands-Health Interface	.142	.32	<.001	.132 - .153

Note. Coefficients corresponding to a 1% increase in the factor scales normalized to 0-100 points.

^a R² of the regression model with only age class, sex and economic sector: .022

short version, which is designed for use in firms and it is more likely to be accepted by Italian organizations which generally do not use long questionnaires. Whilst the original long version of the COPSOQ II is made of 128 items, and the medium one of 87 items, we propose the following model of the relationships among the factors: the 30 items of the questionnaire, excluding four dichotomous ones on offensive behaviors, are grouped in 16 scales (14 of them made of two items, and the remaining two

items used as single variables) that resulted in 4 factors. Some differences with the dimensions intended to be captured by the original questionnaire (Kristensen et al., 2005; Pejtersen et al., 2010) emerged. A main difference is that the *Interpersonal Relations* and *Leadership* factor was replaced in our analysis by two separate factors, one representing the quality of the relationship with the management and with the company in general terms, the other one that with the direct supervisor.

This finding suggests that it is possible to separate a dimension concerning the relationship of the workers with the company's organizational structure, its way of functioning and the social climate perceived at the workplace, from one specifically addressing the relation with a person who is in charge of supervising and support the worker. It has been commented that the dimension of interpersonal relationships at work is a construct partially overlapping with that of social support, but that they differ in that the latter refers more to social relations specifically oriented towards task performing, whereas the former to the opportunity for pleasant and meaningful contacts and for feeling part of a greater social system (Schabracq, 2003). The observation that job satisfaction loaded on the Supervisor Support factor, rather than on that of *Relations with Management*, suggests that job satisfaction is more strongly determined by a supportive work environment, where the relationship with supervisors is characterized by getting help in performing the job, than by good social relationships with the management. Another important difference is that the demand and health dimensions, conceptualized as distinct by the COPSOQ authors, in the present study were merged in a single factor together with work-family conflict, which is an established mediator of the relationship between demand and health (du Prel & Peter, 2015), indicating that the demand dimension is very intertwined with that of work-family conflict and with health. This observation could be explained either by the consideration that psychological demand is the dimension having more impact on health, as suggested by several reviews on mental health (Bonde, 2008; Netterstrom et al., 2008; Stansfeld & Candy, 2006), or that in cross-sectional studies - like the present one - exposure to demand, among workers with health problems or high levels of work-family conflict, is affected by overestimation more than the other psychosocial exposures examined, as observed by Tang (2014).

As for the French and the Danish versions of the questionnaire, some of the Cronbach's alphas values are relatively weak, as 6 out of 14 scales show an internal consistency lower than the threshold value of .7. As suggested by Dupret et al. (2012), the medium and short versions of the questionnaire have been developed by focusing mainly on the content validity of the instrument, and not only on high internal consistency. Furthermore, it is widely recognized that the internal consistency is affected by the number of items (Cortina, 1993): the low internal consistency of some scales of the COPSOQ II - short version, appears explained by the fact that the scales are based at most on only two items.

The ANOVA analysis allowed assessing the discriminant validity of the questionnaire, with results showing that all factors' means were significantly different across gender and economic sector, meaning that they were all able to discriminate among these groups. In general, the ability of the COPSOQ factors to discriminate among different economic sectors gives support to the opinion that this questionnaire is applicable to a wide range of occupations (Dupret et al., 2012).

The concurrent validity was assessed through multiple regression analyses with depression as the predicted variable: the focus on depression is due to its detrimental effects on individuals' quality of life, functioning and job performance. All the factors - especially the *Demand-Health* one - predict depressive symptoms. Our results confirm previous research on the direct association of well-being with job control, showing that the perception of low decision latitude is associated to depressive symptoms (Arcury, Grzywacz, Chen, Mora & Quandt, 2014), as well as with *Supervisor Support*, according to which supervisors' support would buffer the effects of job demands against negative effects (Arcury et al., 2014; Hall, Dollard, Winefield, Dormann & Bakker, 2013). The mechanisms of the development of depression in relation to these stressors are mostly unknown, with several neurotransmitters likely playing a role, but a sustained activation of the hypothalamus-pituitary-adrenal cortex (HPA) axis appears involved in chronic stress, as suggested by persistently high cortisol levels in both subjects exposed to different types of stressors and patients affected by depression (Chida and Steptoe, 2009). The relation between poor health and depression has been widely demonstrated, with particular attention for the role of burnout: recent research demonstrated that people with severe symptoms of burnout meet also diagnostic criteria for depression (Bianchi et al., 2014). Another critical psychosocial exposure, known to be associated with depression and loading on the *Demand-Health* factor, is work-family conflict, since the need to conciliate work and family demands may produce negative health effects (Garcia, Milkovits & Bordia, 2014). With regard to the factor *Relations with Management*, there is evidence of the link between job characteristics, management conditions and mental health problems. Because individuals spend large part of their time at work, it is conceivable that job relations play a key role in the aetiology of health complaints. That is, stressful work conditions - due, for example, to low predictability or unfair rewards - may predict poor mental health. Indeed, employees who report high levels of job

strain due to job characteristics are more likely to suffer from depression (Wang & Patten, 2001). In particular, it seems that some “job context” management practices (such as the level of role clarity), if not properly managed, are relevant in determining negative health effects: role ambiguity seems to be related to depression. More in general, and as confirmed by our results, management practices based on organizational justice, fair rewards, and role clarity can reduce health complaints, also in terms of depression (Mackie, Holahan & Gottlieb, 2001).

The results of this study should be interpreted in light of some limitations. First of all, even if our sample was drawn from several economic sectors, it was not representative of the general population, as it mainly included blue-collar workers. Furthermore, we are aware of the importance of being prudent in comparing our results with others, based on medium or long versions of the COPSOQ. Because the medium and short scales do not need to be made of the same number of items across different countries (Dupret et al., 2012), we chose to use not all the items of the short version of COPSOQ II, and this could represent a further limitation. However, the items selection was firstly due to parsimony reason and secondly because three scales may be strongly influenced by participants' current mental state.

This study has also a number of strengths, including the large sample size and the extensive collection of information,

which allowed verifying not only the psychometric properties of the questionnaire, but also relationships among variables. Furthermore, the ability of the COPSOQ factors to discriminate among different economic sectors confirms the applicability of this questionnaire to a wide range of occupations (Dupret et al., 2012). Finally, the prevalent presence of females should be considered a strength of this study because there is a dearth of research specifically focused on female industry workers (Arcury et al., 2014).

From an applicative perspective, the assessment of psychosocial risks may be considered as the first preventive step that represents a relevant topic in the current workplace, since psychosocial risk control can help reducing accidents and absenteeism. Accordingly, organizations engaged in managing psychosocial risks can be more competitive, also by improving employees' health at the organizational level. Indeed greater job satisfaction and productivity, and lower absenteeism, have been found as the main organizational outcomes resulting from an effective psychosocial risks management (EU OSHA, 2014). Management practices should be focused at improving the psychosocial safety climate, which represents the first and main step towards higher levels of employees' well-being.

In conclusion, our results support the validity of the Italian COPSOQ II - short version, but further studies might be carried out in order to confirm these findings.

References

- ARCURY, T.A., GRZYWACZ, J.G., CHEN, H., MORA, D.C. & QUANDT, S.A. (2014). Work organization and health among immigrant women: Latina manual workers in North Carolina. *American Journal of Public Health, 104*, 2445-2452.
- BACKÉ, E.M., SEIDLER, A., LATZA, U., ROSSNAGEL, K. & SCHUMANN, B. (2012). The role of psychosocial stress at work for the development of cardiovascular diseases: a systematic review. *International Archives of Occupational and Environmental Health, 85* (1), 67-79.
- BERNAL, D., CAMPOS-SERNA, J., TOBIAS, A., VARGAS-PRADA, S., BENAVIDES, F.G. & SERRA, C. (2015). Work-related psychosocial risk factors and musculoskeletal disorders in hospital nurses and nursing aides: A systematic review and meta-analysis. *International Journal of Nursing Studies, 52* (2), 635-648.
- BIANCHI, R., SCHONFELD, I.S. & LAURENT, E. (2014). Is burnout a depressive disorder? A reexamination with special focus on atypical depression. *International Journal of Stress Management, 21*, 307-324.
- BJORNER, J.B. & PEJTERSEN, J.H. (2010). Evaluating construct validity of the second version of the Copenhagen Psychosocial Questionnaire through analysis of differential item functioning and differential item effect. *Scandinavian Journal of Public Health, 38*, 90-105.
- BLACKMORE, E.R., STANSFELD, S.A., WELLER, I., MUNCE, S., ZAGORSKI, B.M., & STEWART, D.E. (2007). Major depressive episodes and work stress: results from a national population survey. *American Journal of Public Health, 97* (11), 2088-2093.
- BONDE, J.P.E. (2008). Psychosocial factors at work and risk of

- depression: A systematic review of the epidemiological evidence. *Occupational and Environmental Medicine*, 65 (7), 438-445.
- CHIDA, Y. & STEPTOE, A. (2009). Cortisol awakening response and psychosocial factors: a systematic review and meta-analysis. *Biological Psychology*, 80, 265-278.
- CORTINA, J.M. (1993). What is coefficient alpha? An examination of theory and applications. *Journal of applied psychology*, 78, 98.
- DOLLARD, M., SKINNER, N., TUCKEY, M.R. & BAILEY, T. (2007). National surveillance of psychosocial risk factors in the workplace: An international overview. *Work & Stress*, 21 (1), 1-29.
- DUPRET, E., BOCÉRÉAN, C., TEHERANI, M., FELTRIN, M. & PEJTERSEN, J.H. (2012). Psychosocial risk assessment: French validation of the Copenhagen Psychosocial Questionnaire (COPSOQ). *Scandinavian Journal of Public Health*, 40, 482-490.
- du PREL, J.B. & PETER, R. (2015). Work-family conflict as a mediator in the association between work stress and depressive symptoms: cross-sectional evidence from the German lidA-cohort study. *International Archives of Occupational and Environmental Health*, 88, 359-68.
- EUROFOUND (2016) *The sixth European Working Conditions Survey*, <https://www.eurofound.europa.eu/surveys/european-working-conditions-surveys/sixth-european-working-conditions-survey-2015>
- EUROPEAN AGENCY FOR SAFETY AND HEALTH AT WORK (2014). *Calculating the cost of work-related stress and psychosocial risks*. Luxembourg: Publications Office of the European Union.
- GARCIA, P.R.J. M., MILKOVITS, M. & BORDIA, P. (2014). The impact of work-family conflict on late-career workers' intentions to continue paid employment: A social cognitive career theory approach. *Journal of Career Assessment*, 22 (4), 682-699.
- HALL, G.B., DOLLARD, M.F., WINEFIELD, A.H., DORMANN, C. & BAKKER, A.B. (2013). Psychosocial safety climate buffers effects of job demands on depression and positive organizational behaviors. *Anxiety Stress et Coping*, 26 (4), 355-377.
- HU, L.T. & BENTLER, P.M. (1998). Fit indices in covariance structure modeling: Sensitivity to underparameterized model misspecification. *Psychological methods*, 3 (4), 424.
- KRISTENSEN, T.S., HANNERZ, H., HØGH, A. & BORG, V. (2005). The Copenhagen Psychosocial Questionnaire-a tool for the assessment and improvement of the psychosocial work environment. *Scandinavian Journal of Work, Environment et Health*, 438-449.
- KROENCKE, K., SPITZER, R. & WILLIAMS, J. (2001). The phq-9: Validity of a brief depression severity measure. *Journal of General Internal Medicine*, 16, 606-613.
- MACKIE, K.S., HOLAHAN, C.K. & GOTTLIEB, N.H. (2001). Employee involvement management practices, work stress, and depression in employees of a human services residential care facility. *Human Relations*, 54 (8), 1065-1092.
- MONCADA, S., UTZET, M., MOLINERO, E., LLORENS, C., MORENO, N., GALTÉS, A. & NAVARRO, A. (2014). The Copenhagen Psychosocial Questionnaire II (COPSOQ II) in Spain: A tool for psychosocial risk assessment at the workplace. *American Journal of Industrial Medicine*, 57, 97-107.
- NETTERSTROM, B., CONRAD, N., BECH, P. et al. (2008). The relation between work-related psychosocial factors and the development of depression. *Epidemiologic Reviews*, 30, 118-132
- PEJTERSEN, J.H., KRISTENSEN, T.S., BORG, V. & BJORNER, J.B. (2010). The second version of the Copenhagen Psychosocial Questionnaire. *Scandinavian Journal of Public Health*, 38, 8-24.
- PERSSON, R. & KRISTIANSEN, J. (2012). The challenge of assessing the psychosocial working environment: why some self-reports should not be interpreted as environmental exposures. *Occupational and Environmental Medicine*, 69, 932-933.
- SCHABRACQ, M.J. (2003). Organizational culture, stress and change. In: M.J. Schabracq, J.A.M. Winnubst & C.L. Cooper (Eds.), *The handbook of work and health psychology*. Chichester (UK): John Wiley.
- SETTI, I., DORDONI, P., PICCOLI, B., BELLOTTO, M. & ARGENTERO, P. (2015). Proactive personality and training motivation among older workers: A mediational model of goal orientation. *European Journal of Training and Development*, 39, 681-699.
- STANSFELD, S.A. & CANDY, B. (2006). Psychosocial work environment and mental health: A meta-analytic review. *Scandinavian Journal of Work Environment & Health*, 32, 443-462.
- STANSFELD, S.A., SHIPLEY, M.J., HEAD, J. & FUHRER, R. (2012). Repeated job strain and the risk of depression: Longitudinal analyses from the Whitehall II Study. *American Journal of Public Health*, 102 (12), 2360-2366.
- TABACHNICK, B.G. & FIDELL, L.S. (2001). *Using Multivariate Statistics*. Boston: Allyn and Bacon.
- WANG, J. & PATTEN, S.B. (2001). Perceived work stress and major depression in the Canadian employed population, 20-49 years old. *Journal of Occupational Health Psychology*, 6, 283.
- WANG, S.M., LAI, C.Y., CHANG, Y.Y., HUANG, C.Y., ZAUSZNIIEWSKI, J.A. & YU, C.Y. (2015). The relationships among work stress, resourcefulness, and depression level in psychiatric nurses. *Archives of Psychiatric Nursing*, 29 (1), 64-70.