

The Role of Sentinel Events in the Measurement of Work-Related Stress

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Abstract

Literature has shown that sentinel events may be considered as markers for measuring work-related stress levels. This aspect has been recognized by the Italian legislation, which requires its recognition for the measurement of occupational stress. This study aims to understand the role of sentinel events in the measurement of work-related stress. Samples of 249 subjects were divided in two balanced and proportional categories (inside sentinel events and outside sentinel events). At the samples the Organizational and Psychosocial Risk Assessment (OPRA) questionnaire was administered. The tests T-student and ANOVA from the OPRA results didn't show any statistically significant differences between the subjects belonging to the sentinel events and those not belonging.

Keywords

Work-Related Stress, Sentinel Events, OPRA Questionnaire, Occupational Stress

1. Introduction

The increased competitiveness in the job market, has led organizations to urgently ask employees to: be proactive, have initiative, work with all the staff, take full responsibility for their own professional development, adhere to high levels of performance and to complete the assigned tasks in a short time (Schaufeli & Bakker, 2008). These environmental pressures influence both every day behaviours as well as the affective-cognitive sphere, encouraging the development of stress conditions (Cox, Griffiths, & Rial-Gonzalez, 2002; Xanthopoulou, Bakker, Demerouti, & Schaufeli, 2007).

The academics interest for organizational well-being could be found in the increasing scientific production, which gave birth to a large and widespread consensus on work-related stress being a major problem in the

workplace (Damiani, Federico, Pinnarelli, Sammarco, & Ricciardi, 2006; Jackson & Rothmann, 2005; Marinaccio et al., 2013). In fact, it has a significant effect on both the health of employees (Damiani et al., 2006; Deitinge et al., 2009; Nahar, Hossain, Rahman, & Bairagi, 2013; Nieuwenhuijsen, Bruinvels, & Frings-Dresen, 2010; Sakketou, Galanakis, Varvogli, Chrousos, & Darviri, 2014; Thorsteinsson, Brown, & Richards, 2014; Von Onciul, 1996; Xiang, Coleman, Johannsson, & Bates, 2014) as well as the productivity and competitiveness of companies (Damiani et al., 2006; Kerr, McHugh, & McCrory, 2009; Magnavita & Garbarino, 2013; Van der Klink, Blonk, Schene, & Van Dijk, 2001; Xiang et al., 2014). It therefore seems appropriate to make an accurate assessment of the levels of perceived mental and physical fatigue and therefore an adequate management of conflicts at work to ensure the well-being of the production processes.

The commonly accepted idea is that the protection of physical and mental health of workers is closely related to job satisfaction and that this can improve business productivity (Lee, An, & Noh, 2012; Visser, Smets, Oort, & De Haes, 2003). It appears that job satisfaction promotes positive affectivity in employees, thereby increasing their ease in the working environment (Lee et al., 2012). It is believed that job satisfaction is mainly linked to the characteristics of the work environment rather than the individual variables (Cotton & Hart, 2003; Kohantorabi & Abolmaali, 2014; Lee et al., 2012; Xanthopoulou et al., 2007).

The attention given to the work environment is reflected in the prominence given to phenomena such as absenteeism, overtime, interpersonal conflicts, complaints, letters of recall, and injury rates that are reported in the literature as “sentinel events”. These are indicators of possible development of work-related stress (Deitinge et al., 2009; Magnavita & Garbarino, 2013; Marcatto, D’Errico, Di Blas, & Ferrante, 2011; Patronella et al., 2011) which appears to be linked to both the content (e.g. load and pace of work, shifts and working hours) and the work context (e.g. lack of control, lack of decision-making autonomy and support) (Bosma, Peter, Siegrist, & Marmot, 1998; Giorgi, Leon-Perez, Cupelli, Mucci, & Archangels, 2014; Homer, James, & Siegel, 1990; Johnson et al., 2005; Kerr et al., 2009; Mausner-Dorsch, & Eaton, 2000; Urbanetto et al., 2013).

Based on the provisions of the *Agreement on the European Stress in the Workplace* (08/10/2004), the *Legislative Decree No. 81/2008* and the subsequent circular of the Ministry of Labour and Social Policy of 18/11/2010 have made mandatory in Italy the assessment of work-related stress (Deitinge et al., 2009; Magnavita & Garbarino, 2013; Marcatto et al., 2011; Patronella et al., 2011), proposing guidelines that leave operators free to use methodologies deemed most appropriate. This legislation recognizes the sentinel events a prominent role in the development of work-related stress to the point that asks operators to detect their presence and distribution in the preliminary measurement of work-related stress. In particular, the sentinel events are considered strategic elements in the construction of *homogenous classes* of psychosocial risk. These classes may represent risk indicators of stress, which are objective and verifiable (Bosma et al., 1998; Giorgi et al., 2014; Homer et al., 1990; Johnson et al., 2005; Kerr et al., 2009; Mausner-Dorsch & Eaton, 2000; Urbanetto et al., 2013). Their presence in the workplace, however, is not in itself indicative of stress-related diseases (Faragher, Cooper, & Cartwright, 2004) as to adversely affect the worker and his behaviour. There are both individual components (e.g. self-esteem, self-efficacy, *coping* strategies) (Antonioni, Ploumpi, & Ntalla, 2013; Sakketou et al., 2014) as well as the organizational culture and climate (Neal, Griffin, & Hart, 2000; Parker et al., 2003; Zhang & Lee, 2010). However, the current regulations and the most reliable theories on work-related stress give to job characteristics (e.g., autonomy, variety of tasks, job application, social support, feedback, safety at work, gains) a prominent role, compared to the individual variables, in the possible developments of work-related stress. These factors seem to have a decisive influence on the worker perception of the work situation. As a result, they are fundamental aspects of the assessment of psychosocial risks (Deitinge et al., 2009).

This study aims to understand the role of the sentinel events in the measurement of work-related stress on the basis of the information provided by the constraints of the Italian legislation. The following is a presentation of preliminary data from a very complex study, which covered workers of a debt collection company present throughout the Italian territory, of which a significant amount of data is still being processed.

2. Method

2.1. Sample

It consists of a non-probabilistic balanced and reasonably chosen sample in relation to organizational variables related to the job content. It is made up of 249 subjects from a population of 770 people; thus, it represents about 30% of the population. Practically, it is made up of individuals who fall into the following risk categories: inside

sentinel events (ISE) and outside sentinel events (OSE). Considering this partition, it was formed taking into account the work function—corporate (C group), governance (G group), back office (B group)—and organization conditions as well the length of service: Cluster 1 (<5 years), Cluster 2 (5 - 15 years), Clusters 3 (16 - 25 years), Cluster 4 (>25 years).

2.2. Instrument

An OPRA questionnaire (Organizational and Psychosocial Risk Assessment) was used to assess work-related stress (Magnani, Mancini, & Majer, 2011). OPRA is a multifactorial questionnaire developed by Academy to evaluate effectively the presence of psychosocial risk factors as well as work-related stress conditions in accordance to the requirements of the Legislative Decree No. 81/08. The solid theoretical platform on which it was developed the instrument is supported by qualitative and quantitative empirical tests that confirm the psychometrics properties. It is structured in three parts, each of which evaluates different aspects of the work experience based on a 5-point Likert scale (from “never” to “always”) through three indices:

- *Risk index (RI)*. It consists of items that assess the malaise resulted from a condition of low identification with the group or organization to which they belong, by low job satisfaction, poor confidence in the organization and from the consideration of wanting to leave their place of work. This index has Cronbach’s alpha .71.
- *Inventory of the sources of risk (ISR)*. It consists of items distributed over nine factors responsible for evaluating the sources of stress at work that may cause distress or discomfort. This index has Cronbach’s alpha .67.
- *Mental and physical health (MPH)*. It is a two-dimensional scale (16 items) that assesses the presence and frequency of physical and psychological disturbances. It depicts an aggregated score that provides an estimation of the effects resulting from stressful working conditions. This index has Cronbach’s alpha .90.

2.3. Procedure

A sentinel events database (SED) made up of a double-entry table was created: in the line there are the ID codes of the subjects; while in the column there are the variables related to sentinel events (turnover, sick days, overtime, working unit shift, absences etc.). Thus, we were able to perform the intersections between structural variables—namely elements structuring work activities—(e.g., role, work function, etc.) and the sentinel events. Moreover, the sentinel events were monitored in relation to the parameters of average and duration. In this way, the homogeneous classes of risk were obtained. This survey highlights that 71.89% of the population was affected by the sentinel events, while the remaining 28.11% was left out. Thus, we proceeded to performing a sampling that takes into consideration the presence or absence of sentinel events according to the work function, by role, by working unit and territorial unit.

The results obtained after the administration of the OPRA questionnaire were then subjected to statistical analysis using the Software STATA 12.1 (STATA CORP.). The Shapiro Wilk test was used to ensure that the same data were in accordance with a normal distribution. Subsequently the T-student was conducted to operate a comparison between the means of subjects ISE and OSE in relation to the total score of the three indexes OPRA. Furthermore, the correlations between the different OPRA indexes were calculated in order to evaluate a possible relationship between the variables. Subsequent researches were operated by ANOVA in order to understand if there were any differences in the score of the three OPRA indexes in relation to the subjects ISE and OSE due to variables such as length of service and job function.

3. Results

The comparison between the means of subjects ISE and OSE by T-student does not show statistically significant differences in relation to the three indices OPRA, RI, ISR, and MPH with a p value $> .05$ (Table 1). Therefore, the sentinel events do not evidence any difference in the results.

All the stratifications for the three indices (RI, ISR, and MPH) for work functions (B, C, G group) and for the length of service (Cluster 1, 2, 3, 4) were done. The comparison between the means of ISE and OSE is significant only RI in relation to job function G with p value .003 and the length of service (5 - 15) at p value .0174 (Table 2). Consequently, subjects ISE belonging to the functions G and seniority is 5 - 15 have different average

Table 1. T-student between ISE e OSE for OPRA indexes.

	Subject	Risk index		Inventory of the sources of risk		Mental and physical health	
		Mean (SD)	95% conf. inter.	Mean (SD)	95% conf. inter.	Mean (SD)	95% conf. inter.
ISE	179	16.77 (1.82)	[16.50; 17.03]	183.23 (13.68)	[181.21; 185.25]	36.41 (11.86)	[34.66; 38.16]
OSE	70	16.28 (1.97)	[15.81; 16.75]	184.88 (12.34)	[181.94; 187.82]	36.4 (9.87)	[34.04; 38.75]
<i>p</i> value			.065		.38		.98

Note: T student with unpaired data with equal variance.

Table 2. T-student between ISE e OSE stratified for risk index.

RI	obs	ISE		OSE			<i>p</i> value
		Mean (SD)	95% conf. interval	obs	Mean (SD)	95% conf. interval	
Cluster 2	97	16.97 (1.99)	[16.57; 17.38]	47	16.14 (1.82)	[15.61; 16.68]	.017
G group	59	17.01 (1.61)	[16.59; 17.43]	7	15 (1.91)	[13.22; 16.77]	.003

Note: T student with unpaired data with equal variance.

compared to the same belonging to OSE. There is no statistical significance in the stratification made for indexes ISR and MPH in relation to specified variables and related to the subjects ISE and OSE.

The calculation of the Coefficient of Spearman indicates the absence of a significant correlation between RI and the other two indexes ISR ($r_s = .04$; p value .52) and MPH ($r_s = .07$; p value = .23). While ISR and MPH show a significant correlation even if in a medium low average ($r_s = .26$; p value = .00) (Table 3).

The results of ANOVA performed to verify any significant difference in the means between the various company BCG, do not show a statistically significant difference between the means of these groups, respectively, RI, ISR and MPH with a p value > .05 (Table 4).

The ANOVA for length of service does not show significant differences between the means of several groups (Table 5).

4. Discussion

The results show a substantial absence of difference between the scores reported by the subjects ISE and OSE in relation to the OPRA indexes. In our view, this can be explained by the time elapsed between the detection of the data relating to the identification of sentinel events, the subsequent construction of the SED, the definition of the sample and at last the administration of the OPRA questionnaire. These steps have required a whole year of work. This time frame is able to refine the different working conditions (e.g. workload, turnover, overtime, etc.) as these are by nature mutable because of the changes in market conditions (De Croon, Blonk, De Zwart, Frings-Dresen, & Broersen, 2002). This time dimension is not unknown to the diagnostic criteria for disorders related to stress (Halpern, 2005; Leymann & Gustafsson, 1996). The DSM-V with American Psychiatric Association (2013), reports that in fact both the continuous and persistent exposure to stressors promotes the development of certain diseases by stress rather than others. Moreover, the work of *National Institute for Occupational Safety and Health* (1999) has shown how this aspect of temporal continuity is able to have a negative impact on different levels of strain regardless of the personality variables (Fraccaroli & Balducci, 2011).

Hence, the time factor seems to play a crucial role in relation to the value that the sentinel events can assume in the measurement of work-related stress. This element, in our view, also explains the absence of statistical significance compared to the stratification of the results for the work functions (B, C, G group) and the length of service (Clusters 1, 2, 3, 4) in relation to the indexes IRS and MPH. However, these variables become statically significant for RI producing a difference between the subjects ISE and OSE.

This fact, apparently in contradiction with the above statements, may find a possible explanation based on the absence of correlation between the RI and the remaining two indices IRS and MPH. This means that the RI moves independently in relation to the other two indexes. The RI consists of aspects that have to do with the identification with the working group and/or organization, job satisfaction and confidence in the company as the intention to leave the workplace. It is generally accepted that these factors—which refer to a sense of belonging

Table 3. Correlation of spearman between risk index, inventory of the sources of risk, mental and physical health.

	ISR	MPH	ISR	MPH
RI	$\rho = .04$	$\rho = .07$		$\rho = .26$
<i>p</i> value	.52	.23	<i>p</i> value	.00

Table 4. ANOVA for work functions (back office, corporate, governance).

		Risk index	Inventory of the sources of risk	Mental and physical health
Work functions	Subject	Mean (SD)	Mean (SD)	Mean (SD)
Group C	123	16.55 (1.87)	183.76 (13.94)	36.06 (11.04)
Group B	60	16.61 (2)	185.25 (12.47)	36.45 (11.50)
Group G	66	16.80 (1.74)	182.16 (12.89)	37.03 (11.81)
F		.38	.84	.16
Prob > F		.68	.43	.85

Table 5. ANOVA for length of service (<5 years; 5 - 15 years; 16 - 25 years; >25 years).

		Risk index	Inventory of the source of risk	Mental and physical health
Length of service	Subject	Mean (SD)	Mean (SD)	Mean (SD)
Cluster 1	85	16.68 (1.74)	181.51 (13.39)	36.90 (11.51)
Cluster 2	144	16.70 (1.97)	184.60 (13.18)	36.29 (11.17)
Cluster 3	7	15.57 (1.90)	183.28 (17.37)	32.57 (11.29)
Cluster 4	13	16.07 (1.32)	188.15 (11.17)	36.61 (12.56)
F		1.23	1.48	.33
Prob > F		.29	.22	.8

(Mael & Ashforth, 1992; Pozzi, Marta, Marzana, Gozzoli, & Andrisano-Ruggieri, 2014)—may be a protective factor in relation to the development of a disease from stress determining welfare conditions.

However, in our opinion, other factors such as organizational culture may play a decisive role in shaping this sense of belonging in a different way, attributing a different meaning to it (Ruggieri, Pozzi, & Ripamonti, 2014). Compared to our data, for example, subjects G appear most at risk because their job role requires a process responsibility—they perform executive functions and governance—which also involves the activities of the other two roles, that is, a sense of responsibility *tout court*, not closely connected with the mere individual activity of each of them as with the entire business process.

Instead the significant difference reported for RI only by those of Cluster 2, in our opinion, is explained by the difficulties on the behalf of those entities to combine aspects of working life with those of private life. As is known the work-balance (Allen, Herst, Bruck, & Sutton, 2000; Hammeret, Bauer, & Grandey, 2003; Turk, Davas, Tanik, & Montgomery, 2014) plays a crucial role in the prevention of work-related stress. It points out that the average age of workers examined is about 40 years, and most of them fall into this category of service length. The pressures to which they are subjected are as much of working nature as probably related to their new family as well as the original one. In particular, in Italy, the link with the family is as much a constraint as a resource to the condition of well-being (Naldini & Saraceno, 2007; Peery-Jenkis, Repetti, & Crouter, 2000).

5. Conclusion

The results show a substantial absence of difference between the scores reported by the subjects ISE and OSE. They confirm the literature data that work contents and conditions are critical elements in the measurement of work related stress. Concurrently, they point out the need to grasp their variations in order to a time dimension. The time prospective in the measurement of work-related stress can have a crucial role in relation to the value

that the sentinel events can assume, but it can make a useful contribution for understanding the onset of mental and physical condition of malaise.

6. Limitations and Future Research

The study certainly has some limitations. Based on the results obtained, we believe that an appropriate assessment of the relationship between sentinel events and work-related stress is possible only through a longitudinal study. This would allow to properly assess the effects of continuous exposure to stressors in terms of duration and frequency (Gorrese & Ruggieri, 2012, 2013). Other variables not to be overlooked are the personality characteristics (e.g., self-esteem, self-efficacy, coping strategies, sense of coherence) by reason of the fact that they are able to influence the perception and evaluation of stressors as well as provide a different answer in terms of coping strategies (Cotton & Hart, 2003; Rothmann, Steyn, & Mostert, 2005). Exceedingly, it would be necessary to cross these data with those related to organizational culture, in order to have an overall view of the onset of work-related stress. (Xanthopoulou et al., 2007).

Future research should therefore focus on the relationship between stressors and exposure time to these stressors, taking into account the active dynamics in the workplace.

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