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Understanding the relationship between Sentinel Events and Sources of Work Related Stress for prevention programmes. An Italian survey

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ABSTRACT. Objective: According to Legislative Decree n. 81/08 and Ministerial Circular of 18/11/2010, this paper proposes to verify the relationship between the sources of risk of stress, sentinel events and gender.

Method: Sentinel events and their variations are mapped for three years. Successively, a self-reported OPRA (Organizational and Psychosocial Risk Assessment) questionnaire was administered. The sample was not probabilistic and balanced for two categories: Inside Sentinel Event and Outside Sentinel Event. 249 subjects were extracted from a population of 770 subjects of a debt collection firm. A two-way ANOVA was applied.

Results: The results show that sentinel events and Gender have no relationship with the inventory of sources of risk.

Conclusion: Future research should consider the relationship between stressors and their exposure time, considering the working environment dynamics. In this way, the relationship between stressors and sentinel events can be studied and tested in greater detail, showing empirical evidence that may be useful for health prevention programmes.

Key words: Work Related Stress, Sentinel Health Event, occupational stress, OPRA, WSED - Stress Method.

RIASSUNTO. Obiettivo: Il presente lavoro si propone di verificare la relazione tra le fonti di rischio dello Stress, eventi sentinella e genere secondo quanto richiesto dal decreto legislativo n.81/08 e dalla successiva Circolare Ministeriale del 18/11/2010.

Metodo: Si è proceduto alla mappatura degli eventi sentinella lungo un arco temporale di tre anni. I risultati della mappatura sono stati utilizzati per procedere ad un campionamento non probabilistico bilanciato, a scelta ragionata di 249 soggetti estratti da una popolazione di 770 dipendenti di una grande azienda di recupero crediti. I soggetti sono stati contrassegnati per l'appartenenza a due categorie: Dentro gli Eventi Sentinella e Fuori gli Eventi Sentinella. Successivamente si è proceduto alla somministrazione del questionario OPRA (Organizational and Psychosocial Risk Assessment). I risultati ottenuti sono stati sottoposti ad analisi statistica mediante ANOVA a due vie.

Risultati: nessuna significatività statistica è stata riscontrata tra eventi sentinella, fonti del rischio di stress e genere
Conclusioni: Le ricerche future dovrebbero concentrarsi sulla relazione tra stressor e tempo di esposizione agli stessi tenendo conto della dinamica lavorativa propria dell'azienda in questione. In questo modo, la relazione tra eventi sentinella e stressor potrà essere indagata in modo più approfondito, fornendo evidenze empiriche estremamente utili ai fini prevenzione.

Parole chiave: stress da lavoro correlato, eventi sentinella, stress occupazionale, OPRA, WSED - Metodo Stress.

Current literature has highlighted how work-related stress is one of the main health problems in the workplace, whose adverse effects impacts on the physical, social and mental well-being of the workers (1,2) By incorporating the provisions of the *European Agreement on Stress in the workplace (10/8/2004) Legislative Decree no. 81/2008* and the subsequent circular from the Ministry of Labour and Social Policy 18/11/2010 has made the evaluation of work-related stress based on scientific findings mandatory in Italy (3).

Italian law regulates the methods for the detection of work-related stress, by prohibiting the use of individual and subjective variables, e.g. personality characteristics, in order to protect workers from possible discriminatory actions. On the contrary, it prescribes the use of «objective and verifiable indicators, where possible numerically significant, belonging to three distinct categories: sentinel events, factors of job content and work context factors» (3).

Sentinel events are defined in the work of the Joint's Committee as “an unexpected occurrence involving death or serious physical or psychological injury, or the risk thereof. Specifically serious injury includes the loss of limb or function. The event is called “sentinel” because it sends a signal or warning that requires immediate attention” due to the possible onset of disease. They assume a leading role in the development of work-related stress, to a point that the Italian law requires entities to detect their presence, considering them strategic for the construction of homogeneous classes of psychosocial risk (4). These classes can represent risk indicators of stress, both objective and verifiable (absenteeism, turnover, illness, overtime etc.). The legislative factors of the content and context of the work are closely anchored to the results of study as they recognize that the evaluation of the parameters of the working environment appears to be essential for the evaluation of stress or more generally malaise due to organizational condition.

The load and work rate, rotations (working hours, shifts), career development, organizational culture, work-life balance, quality of relationship, social, organization and environmental support and safety are universally defined as aspects of the content and context of the work that determine the main sources of stress (5-7). Gender variable is also considered a marker of difference in the stress on the basis that several studies have shown higher

levels of stress in women than men (8,9), with the law considering this difference in stress measurement.

However, the relationship between stress and sentinel events established by legislation, has not yet been sufficiently studied. The lack of scientific evidence makes it impossible to fully understand this relationship, which is crucial for the development of policies of surveillance and prevention. Furthermore, there are a few studies that investigate this relationship on the basis of gender differences (10).

The present study investigated the relationship between sentinel events and risk factors related to the content and context of work on the basis of gender differences.

In particular, sentinel events were used to obtain homogeneous psychophysical risk classes of workers. Overall, the research investigated the relationship between sentinel events, gender and stress based on three dimensions: risk factor stress, sources of risk of stress, mental and physical symptoms related to stress. The partial data of this work is reported, relating to the relationship between sentinel events, gender and sources of stress since they are considered essential by the Italian law.

Method

A non-probabilistic sample of 249 subjects (98 M; 151F), from a population of 770 employer of a single debt collection company (30% of the population), was balanced for two categories: Inside Sentinel Events (ISE) and Outside Sentinel Events (OSE). An Organizational and Psychosocial Risk Assessment (OPRA) questionnaire was used to assess work-related stress (11). OPRA is a multifactorial questionnaire that was developed by the Academy to effectively evaluate the presence of psychosocial risk factors and work-related stress condition. It evaluates different aspects of the work experience based on a 5-point Likert scale through three indices: *Risk Index (RI)*, *Inventory of the sources of risk (ISR)*, *Mental and Physical Health (MPH)*. For this part of the research, the *ISR* has a Cronbach's alpha of .71. This index consists of

65 items distributed over nine factors responsible for evaluating the sources of stress at work that may cause distress or discomfort: Culture & Organization (10 items), Role (7 items), Career Development (6 items), Autonomy (5 items), Work-Life Balance (5 items), Environment and Safety (7 items), Workload (8 items), Working Time (6 items), Quality of Relationships (11 items).

A work on a Sentinel Events Database (W-SED) comprised of a double-entry table was created to obtain homogeneous classes of risk. The line includes the ID codes of the subjects, whereas the column contains the variables related to sentinel events (e.g., turnover, sick days, overtime, working unit shift, absences.). It was then possible to perform the intersections between Gender and Sentinel Events in order to work place, organization unit etc. Moreover, the sentinel events were monitored in relation to the parameters of average and duration for three years (2009-11). The homogeneous classes of risk were obtained and all information related to the subject is lost. This survey shows that 71.89% of the population was affected by sentinel events, and the remaining 28.11% was left out. Thus, a sampling that considered the presence or absence of sentinel events according to gender was then carried out.

The results obtained by OPRA were then subjected to statistical analysis using the Software STATA 12.1. The *Shapiro Wilk Test* was used to ensure that the data were in accordance with a normal distribution. Subsequently, a two-way ANOVA was carried out to examine the effect of gender and SE (independent variables) on *ISR index*. Gender and sentinel events (both dichotomous variables) were considered independent variables and the *ISR index* was considered dependent variable.

Results

Table I provides details on the relationship between the *ISR*, SE and Gender. Any significance is pointed out. The simple main effects analysis showed that the mean

Table I. Relationship between the *ISR*, SE and Gender

Inventory of Source of Risk					
Source	Partial SS	DF	MS	F	p-value
Model	1201.59	3	400.53	2.29	.05
SE	298.93	1	298.93	1.71	.19
Gender	32.57	1	32.57	.19	.66
Interaction	994.21	1	994.21	5.69	.017
Simple main effects					
	OSE margins	ISE margins	Contrast OSE vs ISE	p-value	C.I. 95% contrast
Male	187.93	180.94	6.99	.016	(1.31; 12.67)
Female	182.6	184.63	-2.03	.4	(-6.81; 2.73)
Simple main effects					
	Male margins	Female margins	Contrast Male vs Female	p-value	C.I. 95% contrast
OSE	187.93	182.6	5.33	.095	(-.92; 11.59)
ISE	180.94	184.63	-3.69	.069	(-7.68; .29)

scores of *ISR* in male subjects were significantly different split by SE: 0 (187.93); 1 (180.94) p.Value 0016, while in the female subjects there were no significance difference SE: 0 (182.6); 1 (184.63) p.Value 0,40. The contrast between Male OSE and ISE (6.99) was statistically significant (p. 0.01 Value).

Discussion

In this work, sentinel events appear to lose consistency with regard to their alarm function, thus failing in their managerial action to promote health in the workplace, acknowledged by the National Institute for Occupational Safety and Health (12).

In fact, the results show a substantial absence of differences between the scores obtained by the ISE and OSE subjects in relation to *ISR*. As a result, the time gap between the various steps of the study may have changed the working conditions, thus affecting the role assumed by sentinel events in the measurement of work-related stress. These facts suggest that sentinel events are not in themselves indicative of the presence of stress-related pathologies. This could be explained by the time that elapsed between the detection of sentinel events and the subsequent administration and processing of the OPRA (13, 14, 15).

If on the one hand this may seem a limitation of the study, on the other, it suggests that future research should consider sentinel events in a dynamic perspective, as factors subject to change due to the change in the work processes. For these reasons, they can or cannot determine a cumulative effect of environmental pressures. Moreover, the absence of a gender difference indicates the need to constrain detection systems stress the cultural changes under way that record the occurrence of equal roles for men and women. For example, it is difficult today to imagine a workplace of only men or only of women, just as it is hard to imagine that a male figure is anchored only in job functions and without commitment to home care.

To better understand the relationship between Sentinel Events and work-related stress, we should therefore carry out a longitudinal study that assesses the continuous exhibition to stressors in terms of duration and frequency as well as in relation to gender. There is a clear need for a system of detection of sentinel events that can grasp the occurrence and co-occurrence between sentinel events. In this way, the event is anchored to a preventive function, due to its projection in a dynamic dimension capable of complying with the proximity in time between events and work activity. A contribution towards this could easily come from Mobile Health and Telemedicine. Building a software that can detect the change of the phenomena may

provide the monthly alert system that would be of great help to limit risks.

Future research must study in further detail the relationship between stressors and exposure time to the same, taking into account the dynamic and specific working environment in which the survey is carried out.

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