

Work-Related Stress Questionnaire (WRSQ): a new tool to assess psychosocial risks at workplaces

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Abstract

Introduction. Work-related stress (WRS) can harm both physical and mental health but it shouldn't only be considered in its negative sense. The evaluation of WRS cannot be separated from the analysis of the subjective perception of workers, usually made by questionnaires. The aim of this pre-pilot study is to identify a new questionnaire capable of exploring as many psychosocial risk domains as possible and with a high internal consistency.

Material and methods. A first version of the questionnaire was administered to a *convenience sample* selected on a voluntary basis; both socio-demographic and work-related data were collected. A single item test was conducted on a group of 50 workers in order to assess whether the questions were confusing and to understand if they could be improved. The study sample completed the questionnaire at time 1 and time 2 (after 3 days). The 33-item version of the questionnaire was web-based in Google Form. *Cronbach's alpha* and *Pearson's r* were calculated.

Results. The analysis of the 33-item questionnaire at time 1 shows an excellent reliability with Cronbach's alpha coefficients of 0.93. At time 2 Cronbach's alpha coefficients was 0.94.

Based on the test-retest score, the items with the highest scores were selected as part of the final version of the questionnaire (10-item). The reliability of this 10-items version is high with a Cronbach's alpha coefficients of 0.86 both at time 1 and at time 2. Two items have been chosen to explore the "emotional demand" and "dealing with technology".

Conclusions. The pre-pilot study provided a questionnaire with high reliability and high repeatability. In its final version, the questionnaire investigates different psychosocial risk domains and represents a possible useful tool for assessing worker's exposure to them. The Authors reserve to administer the questionnaire to a larger population.

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Key words: Work-related stress, psychosocial risks, questionnaire, risk assessment

Introduction

Work-related stress (WRS) is a phenomenon with the potential to harm both physical and mental health (1). The scientific interest in this specific topic led to an evolution of occupational medicine in order to deal also with psychosocial risks instead of with the "traditional" ones (chemical, physical, biological) (2). The psychosocial risks which can lead to the development of WRS are very insidious (3,4). Meanwhile, it isn't possible to completely eliminate them from the context and the content of work reaching the so-called "zero risk". Furthermore, the workplace organization must face dynamic challenges: the workloads, the control over one's work, the relationships between colleague and superiors etc. (5,6). Add to this, an element of complexity is the fact that the exposure to psychosocial risks is modulated and mediated by individual characteristics, expectations and abilities, generating a "cognitive appraisal" on which depend the characteristics of WRS' phenomenon (7).

The literature shows how WRS shouldn't only be considered in its negative sense, but also in a positive one. It has been described how several factors of the content and context of work, linked with WRS, can compromise the health status of the workers (8, 9, 10). Some psychosocial risks such as "violence" are more widespread among some categories of workers such as health workers (11, 12).

The evaluation of WRS cannot be separated from the analysis of the subjective perception of workers (13), even if different objective approaches have been proposed (14). WRS' assessment in different working contexts (15) allows to plan the preventive interventions in order to moderate the effects on workers (16).

Different tools have been proposed, some focus only on the perception or exposure to psychosocial risks while more complex ones also evaluate health outcomes and symptoms associated with WRS (17,18). An approach that combines different questionnaires dedicated to the evaluation of every single aspect is also possible (19).

The purpose of this pre-pilot study is to identify, from a larger set of items and through the analysis of the test-retest reliability, a smaller questionnaire capable of exploring as

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many psychosocial risk domains as possible and with a high internal consistency.

Materials and Methods

Sample

to carry out the pre-pilot test, the full version of the questionnaire (Table 2) was administered to a convenience sample selected on a voluntary basis. Together with the questionnaire, both socio-demographic data (gender, age, education) and data relating to the working sphere (working times, shift work, jobs that require a contact with the public etc.) were collected.

Questionnaire

In accordance with the scientific literature, a single item test was conducted on a group of workers in order to assess whether the questions were confusing and to understand if they could be improved (20). We started a pre-pilot test of the questionnaire enrolling 50 responders who completed the questionnaire at time 1 and time 2 (after 3 days). Considering a ratio responder:item of the final version of about 5:1 (21).

The 33-item questionnaire explores 10 domains (considered by the Authors as “General Domains” - GDs) that are transversal to all occupational contexts with 3 items for each domain. Those domains are *job satisfaction, workplace, role, job demand, job control, peer’s and managers’ support, relationship, change and work-life balance*. Additionally, the questionnaire explores with one item each, 3 other domains ((considered by the Authors as “Special Domains” - SDs). Those domains are *the emotional demand, dealing with technology and religious, and ethnic or racial discrimination*. SDs are administered only if the item is appropriate to the kind of work; as example the item exploring “the emotional demand” is administered only to workers who interface with users (e.g. customers or patients); the item exploring “the use of technology” is administered only to workers dealing with technology in their work context.

Interview procedures

The 33-item version of the questionnaire was web-based in Google Form (Google Inc, Mountain View, CA). A link was sent to the participants to access the form and, after the completion of the questionnaire, with the same method, it was sent again after 3 days to perform a test re-test correlation analysis. The data were automatically registered along with a time stamp into the online spreadsheet connected with the form. All participants provided informed consent. The invitation e-mail described both the tool and the objectives of the study.

Statistical analysis

The categorical variables were reported as numbers and percentages and the chi-2 test was used to analyze the statistical differences between the 2 sexes in the sample.

Linear variables based on the analysis of the distribution, are reported as means and standard or median deviations and interquartile ranges and have been analyzed with parametric or nonparametric tests respectively.

To assess the internal consistency (reliability) of the questionnaire, *Cronbach’s alpha* test was calculated. Alpha coefficient ranges in value from 0 to 1 and may be used to describe the reliability of factors extracted both from dichotomous (that is, questions with two possible answers) and/or multi-point formatted questionnaires or scales (i.e., Likert scale). The higher the score, the more reliable the generated scale is. Nunnally (22) has indicated 0.7 to be an acceptable reliability coefficient but lower thresholds are sometimes used in the literature.

Test-retest reliability refers to the extent to which individuals’ responses to the questionnaire items remain relatively consistent across repeated administrations of the same questionnaire or alternate questionnaire forms (23). Test-retest reliability was evaluated with a 3 days interval between the two administration of the questionnaire and using Pearson’s product moment correlation coefficient (*Pearson’s r*).

Results

The characteristics of the sample that participated in the study are shown in Table 1.

Table 1. Characteristics of the sample

	Total	Male	Female	P-value
N.	55	26	29	
Age (year)	35.6	35.2	36.0	0.780*
Educational level				
Middle School	46 (83.6)	23 (88.5)	23 (79.3)	0.570**
High School	2 (3.6)	1 (3.8)	1 (3.4)	
Graduation	7 (12.8)	2 (7.7)	5 (17.3)	
Job Seniority				
<10 years	34 (61.8)	17 (65.4)	17 (58.7)	0.146**
≥10 & <20	9 (16.4)	6 (23.1)	3 (10.3)	
≥20	12 (21.8)	3 (11.5)	9 (31.0)	
Shift workers	41 (74.6)	18 (69.2)	23 (79.3)	0.392**
Contact with customer	36 (65.5)	16 (61.5)	20 (68.9)	0.563**

*t-test **Chi-2 test

The analysis of the kurtosis of the variable age of our convenience sample shows that it has a normal distribution. The parametric test of hypothesis (*Student’s t-test*) shows no significant difference between male and female.

The *chi-2 test* demonstrates that there are no differences between males and females as regards to the educational level, job seniority and shift work. The statistical analysis also shows a homogeneous structure between the 2 sexes.

The analysis of the 33-item questionnaire at time 1 shows an excellent reliability with a *Cronbach’s alpha* coefficient of 0.93. At time 2 *Cronbach’s alpha* coefficient was 0.94. The results of test-retest reliability are showed in table 2.

Table 2. The 33-item version of the questionnaire with test-retest coefficients and reliability analysis.

	Test-Retest Coefficient
Job Satisfaction	
I feel comfortable at work*	0.83
My job gives me satisfaction	0.61
Whenever I do a good job, I receive appropriate recognition	0.70
Workplace	
I am given all the tools and instruments I need to do my job*	0.84
My workplace is safe	0.75
My workplace has areas where I can eat and rest	0.83
Role	
My task at work is clear to me	0.61
The role and responsibilities of both myself and my colleagues are clear to me	0.78
It is clear to me how my work contributes to achieve the goals of my organization*	0.84
Job demand	
My workload is excessive*	0.72
I am pressured to work fast	0.73
I could often do a better job if I had more time	0.75
Job control	
I have the freedom to decide when to take a break*	0.79
I have the freedom to decide how to manage my work	0.66
I can work at my own pace	0.61
Support (peer)	
I can rely on the help of my colleagues*	0.83
Communication between colleagues is poor	0.63
My colleagues respect me for the work I do	0.44
Support manager	
I can rely on the help of my boss*	0.79
Communication with my boss is deficient	0.67
My boss is competent in their work	0.71
Relationship	
I have a good relationship with my colleagues	0.69
I have a good relationship with my boss	0.74
I have been victim of physical and/or verbal abuse at work*	0.90
Change	
I feel that my ideas are valued when changes that will affect my work are being considered	0.66
Whenever changes are introduced, it is clear to me how these changes will affect my work	0.69
Employees are always consulted regarding planned changes*	0.65
Work-life balance	
I can be easily granted permissions to be absent from work for personal duties	0.57
My work often interferes with my family, social or personal duties*	0.71
My work hours are flexible	0.70
Emotional demands	
In the workplace i have to hide my real emotions and i have to express others*	0.75
Dealing with technology	
In relation to the machines \ computers \ equipment I use to perform my work and with respect to the problems that may be connected to their use (dangerousness, poor personal update, obsolescence) I can be satisfied. The equipment that I use are useful for carrying out my work, they comply with safety regulations and are of the latest generation. *	0.73
Discrimination	
In the workplace there is discrimination related to either gender, sexual orientation, religious faith, ethnicity or other.	0.61
*Item that will form the reduced version of the questionnaire.	

Based on the test-retest score, the items with the highest scores for GDs were selected as part of the final version of the questionnaire (10-item). The reliability of this 10-items version is high with a *Cronbach's alpha* coefficient of 0.86 both at time 1 and at time 2.

The items chosen to explore SDs have shown an adequate repeatability level as regards to “emotional demand” and “dealing with technology” while the item about “discrimination” was eliminated because the test-retest had a low score.

The reliability of the 10-item questionnaire with the emotional demand item is high with a *Cronbach's alpha* coefficient of 0.87 both at time 1 and at time 2.

The reliability of the 10-item questionnaire with the dealing with technology item is high with a *Cronbach's alpha* coefficient of 0.87 both at time 1 and at time 2.

The reliability of the 10-item questionnaire with both emotional demand and dealing with technology items item is high, having a *Cronbach's alpha* coefficient of 0.88 both at time 1 and at time 2.

The reliability of the different versions of the questionnaire is summarized in Table 3.

Table 3. Reliability of the different versions of the questionnaire.

Questionnaire version	Time 1	Time 2
33-item (complete)	0.93*	0.94*
10-item (just GD)	0.86*	0.86*
10-item + Emotional demand	0.87*	0.87*
10-item + Dealing with technology	0.87*	0.87*
10-item + Emotional demand+ Dealing with technology	0.88*	0.88*
*Cronbach's Alpha		

Conclusions

The pre-pilot study provided a questionnaire with high reliability and high repeatability. In its final version, the questionnaire investigates different psychosocial risk domains and represents a possible useful tool for assessing worker's exposure to them. Based on these results, 3 versions of the questionnaire have been developed: a 10-item questionnaire about GDs, a 11-item and a 12-item one considering SDs questions (one or both respectively).

After the pre-pilot test, the Authors reserve to administer the questionnaire to a larger population in order to assess psychometric abilities, especially as regards the health outcomes that have been related to the phenomenon of work-related stress such as anxiety, depression and sleep disorders.

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