The perception of psychosocial risks through the HSE questionnaire of a population of neurophysiology technicians: a cross-sectional study

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Abstract

Objectives. The Neurophysiopathology Technicians (NTs) are exposed to psychosocial risks, exposure to psychosocial risks that cause related work stress has been related to numerous physical and mental illnesses. The aim of this study is to evaluate the perception of psychosocial risks in a population of this population.

Materials and methods. 54 technicians of Neurophysiopathology were enrolled, consisting of 23 males (42.6 %) and 31 females (57.4 %). All subjects were administered the HSE questionnaire developed by the Health and Safety Executive. the statistical analysis provided for the assessment of the reliability of the questionnaires and the non-parametric analysis of gender differences.

Results. In the total population emerges as critical the perception of the domain “Managers’ Support” with Cronbach’s alpha values for total males and females respectively of 0.87, 0.85, 0.88. In the female population is added the critical perception of the “Peer Support” domain (p=0.026), shows that the employees indicated that they do not receive adequate information and support from their colleagues.

Discussion. The study highlights the exposure to psychosocial risks by technicians of neurophysiopathology able to mediate the phenomenon of WRS. The HSE questionnaire represents a tool capable of highlighting specific risks to which workers are exposed. Furthermore, its ability to capture elements of the work context significantly increases if an analysis is carried out that takes into account the worker’s gender.


Key words: gender differences, psychosocial risk, work-related stress

Objectives

Significant changes that have occurred in the world of work in recent decades have led to emerging risks in the field of occupational safety and health and more and more importance has been given to psychosocial risks in addition to the so-called traditional risks such as chemical, physical and biological (1). The psychosocial risks according to the International Labor Office arise from the interaction between those aspects of the content of work, the organization of work and its management and other environmental and organizational conditions, on the one hand, and the skills and needs of workers from other (2). Scientific evidence suggests that the experience of work-related stress (WRS) is closely correlated with worker exposure to psychosocial risks in the workplace (3,4). WRS is defined as the psychophysical reaction that occurs when job demands exceed the individual’s ability or resources to cope or over-collide with their own needs (5,6).

Among the psychosocial risks that most influence the perception of stress in the worker we find: excessive workloads, a lack of decisional autonomy in the management of one’s work, the lack of support from one’s colleagues or superiors, the presence of relational conflicts in the workplace, the scarce definition of the first role within the company and the lack of involvement regarding the changes in the organization (7,8). The scientific literature has shown that through the phenomenon of WRS, exposure to psychosocial risks has the potential to cause both mental (9) and physical (10,11,12,13) diseases.

Given the strong impact of WRS on workers’ health, in Italy, the assessment and management of this phenomenon are mandatory, as indicated by Legislative Decree no. No. 81/2008. The law requires the assessment of all risks for the health and safety of workers, including the risk from WRS, also indicates to pay attention to groups of workers exposed to particular risks including those related to gender differences, age and origin from other Countries. In order to comply with this regulatory obligation with methodological rigor the Department of Occupational and Environmental Medicine, Epidemiology and Hygiene (Dimeila) of the Italian Workers’ Compensation Authority (INAIL) developed a methodological approach for the assessment and management of WRS. Workers’ perceptions of exposure to psychosocial risks can be...
investigated through the use of standardized and scientifically validated questionnaires. Among these the Italian version of the Management Standard Indicator Tool developed by the Health Safety Executive (HSE) is able to measure those aspects of the work content and context that most frequently represent potential WRS factors. This questionnaire was developed starting from the Standard Management model (14) and subsequently it has been validated in the Italian version (15) and is recommended by the INAIL guidelines which identify how it is advisable to take into consideration the questionnaires of groups of workers that are homogeneous by tasks or role in the ‘organization.

Healthcare professionals are at high risk of development of disorders caused by exposure to psychosocial risks in the workplace such as high workloads, low control of their work and high emotional demands (16,17). A category of health professionals very homogeneous for work tasks and type of patients observed is represented by the Neurophysiopathology Technicians (NTs). The professional training of the NT was activated in 1972 at the Universities of Rome and Bologna, followed by other universities. The professional profile of the NT was regulated by decrees of the Ministry of Health on 26 January 1988 and lastly on 15 March 1995, act, n. 183. The NTs are engaged in the field of the diagnosis of diseases of the nervous system, directly applying, on prescription, the specific diagnostic methods in the neurological and neurosurgical field (Electroencephalogram, Electroneurography, Poligraphy, Evoked Potentials, etc.) and has direct responsibility in the application and in the final result of the diagnostic method used. The NTs employ diagnostic-instrumental methods for the detection of electrocerebral activity for clinical and / or legal purposes; is able to manage operations that underlie the execution of the neurophysiological examination for diagnostic and / or research purposes. It also provides for the preparation and quality control of the instrumentation of the equipment supplied, monitors the proper functioning of the equipment, ascertaining the precision and general quality of its work tools. Their specific task leads them to deal with patients of different ages who suffer from diseases that have important repercussions on both quality of life and survival and it is known that confrontation with death and suffering are upsetting and destructive experiences despite for many operators health services represent routine’s elements (18).

There are no studies in the literature that focused on assessing the perception of psychosocial risks in the professional category of NTs. The aim of this cross-sectional study is to evaluate the perception of psychosocial risks in a homogeneous working group represented by NTs through the HSE Indicator Tool (HSE-IT) questionnaire and evaluate gender differences.

Materials and methods

To carry out the study of a population of only NTs, workers belonging to 17 hospitals in the city of Rome, in which the NTs carry out outpatient activities in the same working hours (40 hours per week), were taken into consideration and contacted directly. It has been decided a priori to take into consideration, in order to limit the confounding factors, only NTs of Italian nationality and with a permanent contract. In fact, the origin from other countries represents a separate risk group as also indicated by the law (Legislative Decrease No. 81/2008) and the fixed-term contract can be a factor that affects the job insecurity and that represents a specific psychosocial risk which can modify the perception of other psychosocial risks investigated by the study (19,20). All subjects were self-administered the HSE Indicator Tool (HSE-IT) questionnaire developed by the Health and Safety Executive (21, 22, 23) in the Italian version (24) consisting of 35 items, each item provides an articulated answer in a five-level Likert, which refer to 7 domains known in literature as potential sources of stress at work:

1. “Demand”: this includes issues such as workload, work patterns and the work environment;
2. “Control”: how much say the person has in the way they do their work;
3. “Managers’ Support”: this includes the encouragement, sponsorship and resources provided by management;
4. the “Peer’s Support”: this includes the encouragement, sponsorship and resources provided by the colleagues;
5. “Relationship”: this includes promoting positive working to avoid conflict and dealing with unacceptable behaviour;
6. “Role”: whether people understand their role within the organisation and whether the organisation ensures that they do not have conflicting roles;
7. “Changes”: how organisational change (large or small) is managed and communicated in the organisation.

All workers’ HSE-IT questionnaires were collected and they were verified, for each, the correct and full compilation. All subjects agreed to the processing of their personal data indicating the availability of sensitive data and accepted that they could be treated, with an anonymous and collective protocol, through scientific procedures, according to the principles of the Helsinki Declaration.

The data of the questionnaires have been loaded into a specific software, Analysis Tool, elaborated by the same HSE that compares the performances of the populations through the comparison with the scores obtained from a reference sample (benchmark) collected by 136 organizations (25), and indicates the stress condition for each domain:

- Those below the 20th percentile (20% of the lowest reference values), for which corrective action is urgently needed.
- Those above the 20th percentile but below the 50th percentile, for which corrective action is required.
- Those above the 50th percentile but below the 80th percentile who do not require any corrective action.
- Those above the 80th percentile, which represent an ideal population and do not need any corrective action.

The statistical analysis, initially, provided for the calculation of Cronbach’s alpha to determine the reliability and internal consistency of the questionnaire for each domain explored by it for the total male and female samples. Subsequently, the non-parametric statistical analysis was performed through the Median Test of the differences in scores obtained from the questionnaires of women and men for each domain explored in order to test the null hypothesis that the male and female populations are identical. Statistical analysis was performed with STATA 14 software.
Results

Overall were collected 54 questionnaires compiled by the participating NTs and all were admitted to the study as they were correctly filled out in all their parts, and as compiled by workers who met the criteria of nationality and type of contract. The population of NTs participating in the study consists of 23 males (42.6%) and 31 females (57.4%). The median of the ages and the values of the first and third quartiles of the total, male and female samples are summarized in Table 1.

<table>
<thead>
<tr>
<th>Num (%)</th>
<th>Median Age (Q1-Q3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total sample</td>
<td>54</td>
</tr>
<tr>
<td>Male sample</td>
<td>23 (42.6%)</td>
</tr>
<tr>
<td>Female sample</td>
<td>31 (57.4%)</td>
</tr>
<tr>
<td>Permanent employment</td>
<td>54 (100%)</td>
</tr>
<tr>
<td>Italian nationality</td>
<td>54 (100%)</td>
</tr>
</tbody>
</table>

The statistical analysis performed for the calculation of Cronbach’s alpha for each domain explored by the questionnaire for the total, male and female population is summarized in Table 2. The values obtained from Cronbach’s alpha can be evaluated according to the De Vellis’ classification (26), which considers unacceptable values (<0.60), undesirable values (≥ 0.60 and <0.65), minimally acceptable values (≥ 0.65 and <0.70), respectable values (≥ 0.70 and <0.80), very good values (≥ 0.80 and <0.90), and high reliability for the scale.

The HSE-IT scores obtained from the administration of the questionnaire in the total, male and female samples are summarized in Table 3. In the total population emerges as critical the perception of the domain “Managers’ Support” indicating that the employees suggest that they do not receive adequate information and support from their superiors. This domain is critical in the total males and females samples, in these latter the lower score is achieved that is lower than the 20th percentile and such to require urgent corrective action. The authors emphasize that the “Managers’ Support” domain has a value considered very good for the reliability of the questionnaire in all three samples.

In the female sample is added the critical perception of the “Peer Support” domain, where in fact a score is obtained that requires corrective action. The critical score in this domain shows that the employees indicated that they do not receive adequate information and support from their colleagues. The authors emphasize that the “Peer Support” domain has a value considered very good for the reliability of the questionnaire in all three samples.
The non-parametric statistical analysis performed through the Median Test of the differences in the scores obtained from the questionnaires of women and men for each domain explored in order to verify the null hypothesis that the male and female populations are identical are showed in Table 4.

The null hypothesis can be refused only in the case of gender differences concerning “Peer Support” and this data is added to the high reliability of the HSE-IT questionnaire for this domain in our samples and to the ability of this questionnaire to highlight the critical perception of the female sample to this domain with respect to the male sample.

Discussion

The study highlights the NTs’ exposure to psychosocial risks that is able to mediate the phenomenon of WRS through the HSE-IT questionnaire.

Observing the results of the questionnaires obtained from the total, male and female samples a cross-critical problem emerges regarding the “Managers’ Support” domain and one that concerns only the female sample that regards the “Peer Support” domain. With the aim of assessing the phenomenon of stress in workers, these results are very important because the support perceived from superiors and colleagues represents a barrier capable of protecting the worker from exposure to other psychosocial risks capable of damaging his health in the long run (27) in particular for health professionals (28).

Regarding the critical domain concerning the “Managers’ Support”, the result obtained from the questionnaire must be taken into consideration because, as emerged from the reliability analysis calculated with Cronbach’s alpha, it obtained a score considered very good. The lack of this support perceived by the workers may depend on the type of leadership proposed by the organization and in the cases of our sample by the health management of the different outpatient centers located in the different structures where NTs operate. Please note that the HSE-IT questionnaire has the ability to identify specific psychosocial risks and is able to contextualize them within the organizational tissue as it has been developed to plan effective corrective interventions and in the specific case shows clearly how to moderate this risk.

Table 3. HSE-IT profile of the 3 samples: mean values total, male and female samples.

<table>
<thead>
<tr>
<th>Domain</th>
<th>Total Sample N=54</th>
<th>Male Sample N=23</th>
<th>Female Sample N=31</th>
</tr>
</thead>
<tbody>
<tr>
<td>Demands</td>
<td>3.69*</td>
<td>3.55*</td>
<td>3.77*</td>
</tr>
<tr>
<td>Control</td>
<td>3.77*</td>
<td>3.66*</td>
<td>3.81*</td>
</tr>
<tr>
<td>Managers’ Support</td>
<td>3.29*</td>
<td>3.33*</td>
<td>3.26*</td>
</tr>
<tr>
<td>Peer Support</td>
<td>3.80*</td>
<td>3.93*</td>
<td>3.69*</td>
</tr>
<tr>
<td>Relationships</td>
<td>4.01*</td>
<td>4.04*</td>
<td>3.96*</td>
</tr>
<tr>
<td>Role</td>
<td>4.35*</td>
<td>4.35*</td>
<td>4.32*</td>
</tr>
<tr>
<td>Change</td>
<td>3.33*</td>
<td>3.43*</td>
<td>3.25*</td>
</tr>
</tbody>
</table>

*Performance classified above the 80th percentile, which represent an ideal population; a Performance classified above the 50th percentile but below the 80th percentile, potential for improvement; c Performance classified above the 20th percentile but below the 50th percentile, requiring improvement; d Performance classified below the 20th percentile requiring urgent improvement measures.

Table 4. HSE-IT score of the male and female sample and of the workers, median and first (Q1) and third (Q3) quartile of the obtained score and non parametric analysis with Median Test.

<table>
<thead>
<tr>
<th>Domain</th>
<th>Male Sample N=23</th>
<th>Female Sample N=31</th>
<th>Pearson Chi²</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>HSE-IT score</td>
<td>Median value (Q1-Q3)</td>
<td>Median value (Q1-Q3)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Demands</td>
<td>3.55* (3.12-4.00)</td>
<td>3.77* (3.50-4.25)</td>
<td>0.827</td>
<td>0.363</td>
</tr>
<tr>
<td>Control</td>
<td>3.66* (3.33-4.00)</td>
<td>3.81* (3.66-4.16)</td>
<td>0.043</td>
<td>0.836</td>
</tr>
<tr>
<td>Managers’ Support</td>
<td>3.33* (2.80-4.00)</td>
<td>3.26* (2.80-4.00)</td>
<td>0.969</td>
<td>0.325</td>
</tr>
<tr>
<td>Peer Support</td>
<td>3.93* (3.50-4.50)</td>
<td>3.69* (3.25-4.00)</td>
<td>4.961</td>
<td>0.026</td>
</tr>
<tr>
<td>Relationships</td>
<td>4.04* (3.75-4.50)</td>
<td>3.96* (3.50-4.50)</td>
<td>0.001</td>
<td>0.975</td>
</tr>
<tr>
<td>Role</td>
<td>4.35* (4.20-4.80)</td>
<td>4.32* (4.00-4.80)</td>
<td>0.556</td>
<td>0.456</td>
</tr>
<tr>
<td>Change</td>
<td>3.43* (3.00-4.00)</td>
<td>3.25* (3.00-3.66)</td>
<td>2.169</td>
<td>0.141</td>
</tr>
</tbody>
</table>

*Performance classified above the 80th percentile, which represent an ideal population; a Performance classified above the 50th percentile but below the 80th percentile, potential for improvement; c Performance classified above the 20th percentile but below the 50th percentile, requiring improvement; d Performance classified below the 20th percentile requiring urgent improvement measures.
exposure in our population it is necessary to plan focus groups focused on the lack of leadership support and on the strengthening, awareness and specific training of the leadership about the importance of the managerial role.

Regarding the critical domain concerning “Peer Support” of the female sample it is necessary to emphasize that this specific risk concerns first of all a domain with high reliability of Cronbach’s alpha and that this difference in the perception of gender is statistically significant ($p = 0.026$). It should be underlined that without the carrying out a gender analysis in our sample the exposure to this risk would not have been highlighted. The individual characteristics can modulate the perception of psychosocial risks at each level (28) and between the individual characteristics the gender is the most important (29). The differences underlying the perception of psychosocial risks by men and women depend on the different coping strategies that they put in place. The male is more inclined to respond with strategies of “problem-focused coping” that are adaptively more effective in the workplace and in the management of emerging issues, instead the woman would tend to put in place an “emotional-focused coping” that would to ruminate on experienced emotional states and this would expose the woman to experience the emotional symptoms of stress and the psychical pathologies related to it (30, 31). The lack of support from colleagues could be linked to environmental risks in the context of the work to which women are most exposed, for example harassment and violence in the workplace (32) that has been related to a predisposition to emotional exhaustion syndromes, such as burnout (33) also associated with anger, frustration, shock, irritation, fear, anxiety, depression and sleep disorders (34). However, this is not the case for the female sample in this cross-sectional study because such unacceptable behavior is highlighted by the HSE-IT questionnaire from the “Relationship” domain in this domain the women have obtained a score with a 50th percentile, with a reliability of the questionnaire for the obtained sample which is small and as such provided with discreet variance and which does not allow the randomization of a stratified sample on which to perform parametric analysis capable of generating more solid evidence.

The limits of the present study are given by the number of the obtained sample which is small and as such provided with discreet variance and which does not allow the randomization of a stratified sample on which to perform parametric analysis capable of generating more solid evidence.

The strength, however, is given by having focused on a subpopulation of the healthcare professionals given by the NTs that represent a homogeneous group regarding the tasks and the role within the organization. Furthermore, this professional population has never been specifically studied in terms of psychosocial risk perception and WRS.

In conclusion, the HSE-IT questionnaire represents a tool capable of highlighting specific risks to which workers are exposed. Furthermore, its ability to capture elements of the work context significantly increases if an analysis is carried out that takes into account the worker’s gender.

References


