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Psychosocial risks in radiology technicians

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Abstract

The current tendencies in promoting health, safety and hygiene in the work place include not only physical, chemical and biological risks, but also psychosocial risks which influence the physical and mental well-being of a worker. Professional healthcare workers, including radiology technicians, are highly exposed to this risk. Our purpose is to evaluate the psychosocial risk factors among radiology technicians work and to inspect the relationship between socio-demographic, socio-professionals and physiologic risks using the COPSOQ to collect the data and also a checklist for self-evaluation of the hygiene and safety conditions in the work place. Group dimension in the COPSOQ reveal a statistic difference between the dimensions of 'social relationship and leadership' and the variable gender. Since multiple transformations occur in the labouring world and with different constraints still taking place, psychosocial risks in the work place is still a subject of concern for professional risks.

Keywords: Psychosocial, risk, radiology, hygiene, safety.

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1. Introduction

The emergence of new occupational health risks, fundamentally psychosocial risks, has led to the growing awareness of the importance and necessity of its prevention (Coelho, 2009). Thus, the current trends in promoting hygiene and safety at work (HST) not only include the physical, chemical, ergonomic and biological risks of the work environments, but also the multiple psychosocial factors and the ways in which these factors influence the physical and mental well-being of the professional (Duarte).

Gollac and Bodier define psychosocial risks as being the health risks created by work through social and psychic mechanisms (Costa & Santos, 2013). These are not only individual in character, but are also associated with economic expectations, human relationships and their emotional aspects. Currently, psychosocial risks such as stress, burnout and mobbing are the challenges of occupational safety and health (Coelho, 2011). It is then considered as an interaction between the individual and the environment in which it operates, where evaluations of this interaction and, consequently, attempts are made to deal with the problem (Sacadura-Leite & Uva, 2007). Claude Bernard (1813–1878) was the first author to approach this concept, considering that the physical threats to integrity of the organism evoke contradictory responses (Melo, 2012). Seyle defines stress as the non-specific result of a bodily requirement whether of a physical, mental or emotional nature (Camelo, 2006). Stress-inducing causes are varied. People react differently to stressors that may be psychosocial, physical, chemical and biological (Riberio, 2012).

The most frequent symptoms are low satisfaction and involvement with work, tension, anxiety, depression, psychological fatigue, frustration, irritability and burnout (Montanholi, Tavares & Oliveira, 2006). Radiology technicians are largely exposed to stress and its consequences due to the closed work environment, the frequency of unforeseen and urgent situations that require quick and effective action, lack of time and resources, interpersonal conflicts, contact with patient suffering and shift work (Lima, 2008).

Burnout is ‘a state of physical, emotional and mental exhaustion caused by long-term involvement in situations of high emotional demands in the workplace, conceptualised as a syndrome of emotional exhaustion, depersonalisation and lack of personal fulfilment at work’ (Coelho, 2009). It is usually caused by a combination of very high expectations and chronic occupational stress, especially in the professions that focus on service delivery (Fonte, 2011).

2. Material and Methods

The sample of this study is non-probabilistic for the convenience of 40 technicians of radiology to perform functions in health units A, B and C of public (two) and private (one) characteristics of the central region of the country. Data collection was carried out through a socio-demographic and socio-professional questionnaire, the ‘Copenhagen Psychosocial Questionnaire – COPSOQ’; a medium version was adapted and validated the Portuguese population, and also a self-check checklist was used for the HST conditions. In the first phase, the questionnaire under study incorporated the characterisation of a personal nature; it included information about the socio-demographic variables (gender, age, marital status and academic qualifications) and socio-professional characteristics (type of bond, managerial functions, years of service and functions). The second part concerned the

characterisation of radiology technicians with regard to the perceptions of social support and self-concept. The COPSOQ emerged in a recent format, reformulated in 2007, consisting of 8 dimensions and 25 sub-dimensions, which is presented in Table 1. The items of these sub-dimensions are answered on a Likert-type scale, with five response options (very often, often, rarely, never and almost never). Finally, in the second phase, the technicians of radiology used a checklist of self-assessment for the conditions of HST. There was a concern to carry out the data collection in the study places during working hours and according to the availability of the professional, between March 1 and May 17, 2016. The statistical treatment of data referring to this study was done using Statistical Package for the Social Sciences version 21.0.

3. Results

As far as institutions are concerned, it is verified that a large percentage of technicians (60%) works in the health unit A, 15.5% in health unit B and 27.5% in health unit C. Regarding gender, the sample comprised 77.5% (*n* = 31) women and 22.5% (*n* = 9) men.

The mean age for both males and females was 42 years, with a standard deviation of 9.58 and 8.02, respectively, and a minimum age of 28 years and a maximum of 65 years. Regarding the marital status and the totality of the sample, it was verified that marital status / union was predominant (65%), followed by the group of singles (20%). In the female gender, we can see that the married / *de facto* civil status was 71% and then divorced / separated state was 16.1%. In the masculine gender, it is verified as equal (44.4%) in the married state / union *de facto* and single state. Regarding academic qualifications, most of them were licensed (65%), with a significant number of radiology technicians with a master's degree (22.5%) and 12.5% with a bachelor's degree.

Analysing statistics on the length of service, the average does not vary according to gender, with 19 years of professional practice and standard deviations of 9.09 in the masculine gender and 9.68 in the feminine gender.

Regarding the type of employment relationship, a large number of radiology technicians have a definite link (57.4%), followed by a permanent contract (31.5%) and a fixed term contract (11.1%). As for the managerial functions, only a small number of the radiology technicians carry out functions in this area (12.5%). This situation occurs in both genders: 11.1% in men and 12.9% in women.

Subsequently, an analysis was made of the correlations between the variables such as gender, academic qualifications and professional linkage and the COPSOQ size sets. Regarding the socio-demographic variables, some characteristics were grouped. In the academic qualifications, radiology technicians were grouped as bachelors to graduates, designated by first cycle and the masters designated by second cycle. On the other hand, the type of definitive link was added to the contract without term.

With regard to the 75th percentile, as recommended by the authors of the instrument used, after the stratification in sub-dimensions, the percentage frequency table was elaborated relative to the number of elements belonging to each sub-dimension. This tripartite division assumed a 'traffic light' interpretation by means of the impact on health, where green corresponds to a favourable situation for health (<2.33), yellow to an intermediate situation (2.33–3.66) and red at risk for health (>3.66).

By analysing the results of the chi-square tests, the items that stand out with a high risk of being harmful to health are 'cognitive requirement' (74.4%), 'transparency of worked paper role' (89, 7%), 'rewards' (92.3%), 'labour conflicts' (82.1%), 'social support of colleagues' (60.0%), 'social work community', 'quality of leadership' (47.5%), 'self-efficacy' (62.5%), 'meaning of work' (95.0%) and 'job satisfaction' (56.4%).

With regard to a moderate risk of being harmful to health, we highlighted 'quantitative requirement' (55.0%), 'sleeping problems' (47.5%), 'predictability' (62.5%), (47.4%), 'horizontal trust' (90.0%), 'vertical trust' (53.8%), 'justice and respect' (52.5%), 'commitment to the workplace' (0%), 'occupational insecurity' (52.5%), 'conflicts of work / family' (47.5%), 'burnout' (55.0%) and 'stress' (67.5%).

With regard to a low risk of being harmful to health, we highlighted 'influence at work' (45.0%), 'depressive symptoms' (45.0%) and 'offensive behaviours' (100.0%). Since COPSOQ is an instrument with a large number of questions, the inferential treatment of the data becomes difficult and complex, as well as the understanding of the results.

Regarding gender, the results of the chi-square tests show that there is a statistically significant difference between the male gender and the female gender in the 'social relationships and leadership' dimension, namely in the sub-dimensions of 'transparency of the worked paper role' (p = 0.004) and 'social support of superiors' (p = 0.005). Thus, we can affirm that technicians of radiology of the feminine gender perceive in average more psychosocial risks related to the dimension of 'social relationships and leadership' than technicians of radiology of the masculine sort. For the remaining sets of dimensions, the gender difference is not statistically significant.

Regarding academic qualifications, it was found that there were no statistically significant differences between the first cycle and second cycle in any group of dimensions of psychosocial risks. We can also highlight the fact that the dimension 'offensive behaviour' is in the situation favourable to health throughout the entire sample.

With regard to the checklist regarding HST conditions applied in the health units under study, a total of 19 different diagnostic rooms were evaluated: conventional radiology (RC); computed tomography; mammography; seriography; angiography/hemodynamics and magnetic resonance. Most of the rooms correspond to RC (37%), followed by TC (21%) and angiography/hemodynamics (16%); mammography and seriography showed an equal number of rooms (11%) and, the last was RM (5%). Completion was based essentially on the observation and analysis of each room by the investigators (when diagnostic tests were not in progress), as well as on the collection of information from the technicians.

In relation to the general conditions of HST, it was verified that all health units had a policy statement that reflected the organisation's commitment to occupational health and safety, with regular audits and/or safety inspections. However, the analysis of occupational accidents is not always carried out. All radiology technicians assume knowledge of each type of risk (chemical, physical, biological, ergonomic and psychosocial), as well as their preventive measures.

Workplace conditions are favourable in all healthcare facilities, since they have structural stability, stable floors and continuous ceilings. The sanitary facilities/locker rooms are easily accessible; however, they are not separated by genders. The ventilation is sufficient, continuous and well distributed, with cleaning and maintenance being carried out regularly. With respect to noise and vibrations, it has been found that there are only noisy environments in the RM rooms. The thermal environment is adequate, and the thermal stress evaluation is performed. Also, the maintenance of the lighting system is carried out, with it being uniform and localised. However, only in the mammography room of health unit B (5%) was the presence of emergency lighting verified.

The electrical installations of all the health units were in good general condition, without overloading the outlets and avoiding humidity or flammable material. However, the electrical boards do not have safety rules attached.

With regard to the chemicals present in the TC rooms, angiography / hemodynamics and seriography are stored in their own place, properly labelled and with the safety data sheets available. Although the professionals received information on the use of PPE (lead apron, gloves and leaden glasses among others), only in 58% was their use verified. Regarding fire prevention and protection, only the RC rooms of health unit B (11%) had fire extinguishers available.

In none of the rooms, the existence of a plan and/or emergency plan was confirmed, as well as any type of information related to this item. It was also verified that only one of the RC rooms of health unit B (5%) presented routes and exits of emergencies different from the normal exits and in any room. There are no signs of any type of emergency, obligation, prohibition or warning.

Finally, in relation to ergonomics, it was found that the work space was adequate in 95% of the rooms. However, only one of the TC rooms of health unit A (5%) presented reduced working space when compared to the number of healthcare professionals.

4. Discussion

As a pioneer study, there are no studies that allow comparing the results obtained with regard to the perception of psychosocial risks of radiology technicians, thus limiting the discussion to the other healthcare professionals. According to the European Agency for Safety and Health at Work, psychosocial risks, especially occupational stress, are among the most commonly reported causes of illness by workers, affecting more than 40 million people across the European Union. A European survey on new and emerging risks has shown that occupational accidents and musculoskeletal injuries and stress are the main concerns (Agencia Europeia para a Seguranca e Saude no Trabalho, Brun & Milczarek, 2007;Agencia Europeia para a Seguranca e Saude no Trabalho, 2010).

Occupational stress is often reported as one of the main concerns of health managers (Agencia Europeia para a Seguranca e Saude no Trabalho et al., 2007). Figures from different member states of the European Union show that occupational stress in the health sector is more common in Slovenia (60%), followed by Greece and Latvia, where stress was reported by 54% of professionals (Agencia Europeia para a Seguranca e Saude no Trabalho, 2009; Agencia Europeia para a Seguranca e Saude no Trabalho, 2010; Organizacao Mundial de Saude, 2008). However, according to the European Labour Research and scientific literature, violence and harassment also predominate the health sector. In

2005, the threats of physical violence were reported by 14.6% of workers, while actual physical violence was felt by 8.4% of workers. Harassment was reported in 7.8% of workers, with sexual harassment reported by 2.7% (Agencia Europeia para a Seguranca e Saude no Trabalho, 2009; Agencia Europeia para a Seguranca e Saude no Trabalho, 2010;Organizacao Mundial de Saude, 2008).

COPSOQ results show that the sub-dimensions with a value greater than 3.66 correspond to health risk; those with a value lower than 2.33 correspond to a favourable situation for health and the sub-dimensions in which the value is between 2.33 and 3.66 correspond to an intermediate health situation. In the present study, the sub-dimensions that stand out with a high risk of being harmful to health are 'cognitive requirement', 'transparency of work paper carried out', 'rewards', 'labour conflicts', 'social support of colleagues', 'social work community', 'quality of leadership', 'self-efficacy', 'meaning of work' and 'job satisfaction'. Compared with national averages for health professionals, it was found that radiology technicians are exposed to other risks that are not included in national averages ('rewards', 'labour conflicts', 'social support of colleagues', 'quality of leadership' and 'job satisfaction'). However, the national averages also indicate with a worse result the sub-dimension of 'vertical trust', which is not verified in the present study (Silva et al., 2000).

With regard to a moderate risk of being harmful to health, we highlighted 'quantitative requirement', 'sleeping problems', 'predictability', 'social support of superiors', 'horizontal and vertical trust', 'justice and respect', 'commitment to workplace instability', 'work / family conflicts', 'burnout' and 'stress'. These results do not go against the national averages in the sub-dimension of 'vertical trust'. On the other hand, in the national averages, it was verified that the sub-dimensions of 'influence in the work', 'rewards', 'labour conflicts', 'social support of colleagues', 'quality of leadership', 'labour satisfaction' and 'depression' present an intermediate risk to health (Silva et al., 2000).

With regard to a low risk of being harmful to health, the items which stand out are 'influence in the work', 'depressive symptoms' and 'offensive behaviours'. These results only agree with the national averages in the sub-dimension of 'offensive behaviours'; it is verified that radiology technicians are in a favourable situation in more sub-dimensions compared to national averages for health professionals (Silva et al., 2000).

Concerning the perception of psychosocial risks, the difference between the radiology technicians of the masculine and feminine gender is very small, with average values being very close. However, radiology technicians of the female gender have a greater perception of the dimension of 'social relationships and leadership' compared to the male gender, constituting the only statistically significant difference. These results confirm the data obtained by Silva and Gomes (2009) in health professionals in studies conducted in Portugal and other countries, which report that women tend to experience higher levels of occupational stress related to relationships at work, professional careers, overwork, remuneration and family problems (Agencia Europeia para a Seguranca e Saude no Trabalho et al., 2007; Silva & Gomes, 2009).

Regarding academic qualifications, it was verified that there are no statistically significant differences between the first and second cycle in any group of dimensions of psychosocial risks. Our results are in agreement with other studies, wherein it is verified that it is the health professionals with post-graduation or masters who report higher levels of exhaustion, depersonalisation, total

burnout value and work–family conflict (Pereira, 2009; Silva & Gomes, 2009). Regarding the type of professional relationship, it was verified that there are no statistically significant differences between the definitive contract and the fixed term contract in any group of dimensions of psychosocial risks. Our results are in agreement with other studies consulted where they reveal stress factors in the different types of contractual relationships, with the professionals with more unstable work contracts being the ones who reveal more problems related to overwork, professional involvement, professional instability, remuneration earned and socio-professional status. Effective professionals show fewer problems in terms of depersonalisation compared to temporary professionals (Silva & Gomes, 2009). In summary, the data obtained in this study suggest the need for further studies that can test the relationship between psychosocial risks and health professionals, especially Radiology technicians. Finally, it is essential not to consider the relevance of the development of intervention strategies, which seek to better promote HST conditions in each context of work.

5. Conclusion

Psychosocial risks constitute a theme that in view of the multiple transformations has occurred in the world of work, and which, due to different constraints, continue to be a concern in terms of occupational risks.

This study allowed us to verify that radiology technicians are in a favourable situation for health in more sub-dimensions compared to the national averages for health professionals.

As a future implication, it is important to study the factors that are at the origin of psychosocial risks and whose presence can be detected in a timely manner, as well as the creation of tools for the intervention and transformation of HST conditions.

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