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RISK PERCEPTION OF WORK-RELATED BURN INJURIES FROM THE WORKERS PERSPECTIVE

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ABSTRACT: This is a qualitative study with the aim to understand the perspective of workers about the risk of work-related burn injuries. The content obtained through semi-structured interviews was submitted to content analysis, guided by the Neuman Systems Model. Participants were six workers who suffered burns and were treated at a specialized center in southern Brazil. Intrapersonal stressors were: male gender, young adults, and Caucasians; previous accidents and denial of risks in handling the instruments. The intense pace of activities, excessive workload, stress, and submission to the determinations of managers, on the other hand, emerged as interpersonal stressors. As extrapersonal stressors, precarious employment status, risks inherent in the tasks, old equipment, and handling instruments before the accident were mentioned. More research and follow-up by health professionals are necessary in order to prevent future accidents at work.

DESCRIPTORS: Accidents, occupational. Burns. Occupational health. Nursing theory. Nursing.

PERCEPÇÃO DE RISCO SOB A PERSPECTIVA DE TRABALHADORES COM QUEIMADURAS

RESUMO: Estudo qualitativo, com objetivo de apreender a perspectiva de trabalhadores a respeito do risco de queimaduras no ambiente de trabalho. Os conteúdos obtidos nas entrevistas semiestruturadas foram submetidos à análise de conteúdo, orientada pelo Modelo de Sistemas de Neuman. Participaram seis trabalhadores que sofreram queimaduras, atendidos em um centro especializado do Sul do Brasil. Como estressores intrapessoais foram identificados: gênero masculino, adultos jovens, raça branca, acidentes prévios e negação dos riscos na manipulação dos instrumentos. Na condição de estressores interpessoais emergiram ritmo intenso das atividades, excesso de carga horária, estresse e submissão às determinações das chefias e, na de extrapessoais, vínculo precário de trabalho, riscos inerentes às tarefas, equipamentos antigos e manipulação dos instrumentos antes do acidente. O estudo e o acompanhamento de profissionais de saúde para prevenção de futuros acidentes de trabalho tornam-se necessários.

DESCRITORES: Acidentes de trabalho. Queimaduras. Saúde do trabalhador. Teoria de enfermagem. Enfermagem.

PERCEPCIÓN DE RIESGO BAJO LA PERSPECTIVA DE TRABAJADORES CON QUEMADURAS

RESUMEN: Estudio cualitativo, con objetivo de aprehender la perspectiva de trabajadores a respeto del riesgo de quemaduras en el ambiente de trabajo. Los contenidos obtenidos en las entrevistas semi-estructuradas fueron sometidos al análisis de contenido, orientado por el Modelo de Sistemas de Neuman. Participaron seis trabajadores que sufrieron quemaduras, atendidos en un centro especializado del Sur de Brasil. Como estresantes intra-personales fueron identificados: género masculino, adultos, jóvenes, raza blanca, accidentes anteriores y negación de los riesgos en la manipulación de los instrumentos. En la condición de estresantes inter-personales emergió ritmo intenso de las actividades, exceso de carga horaria, estrés y sumisión a determinaciones de los jefes y, en la de extra-personales, vínculo precario de trabajo, riesgos inherentes a las tareas, equipos antiguos y manipulación de los instrumentos antes del accidente. El estudio y el acompañamiento de profesionales de salud para prevención de futuros accidentes de trabajo se hacen necesarios.

DESCRIPTORES: Accidentes de trabajo. Quemaduras. Salud laboral. Teoría de enfermería. Enfermería.

INTRODUCTION

Risk situations inherent to human life[1] may cause imbalances in health and the maintenance of well-being, and are thereby considered stressor agents.[2] Daily life is responsible for a multiplicity of dangerous situations, either through the individual's choices or decisions, carelessness or negligence, as well as through the unawareness of the environment where he works. Life in society oscillates between vulnerability and safety and between risk and prudence. Risk is considered a socially built concept and varies by time and local. According to the circumstances and context, the value of life and the risk are distinct.[1]

When the risk derives from performance at work, it is considered that it may sometimes present as visible or invisible through the worker's eyes. Its (in)visibility would be related to aspects of the social and cultural nature of individuals; that is, the interconnected with his life story, sensitivity, and the role these aspects play in family and work contexts.[3]

In the work context, the risk may be understood as a possibility or likelihood of the worker suffering an injury or damage to his physical or psychic integrity when exposed to danger. The relation between danger and exposure, both immediate and in the long term, may result in a risk for occupational accidents or diseases.[4]

Most individuals acting in work environments permeated by many potential dangers for accidents have a partial view of the risks and safety measures necessary for their work process.[5] This (total or partial) invisibility would favor the execution of actions and workers' behavior predisposing them to the occurrence of accidents.

These stand out as the main risks in the work environment: physical; chemical; ergonomic; psychosocial; and those resulting from equipment handling and work organization,[3,6-7] which may incapacitate or lead to workers' deaths.[7] From this perspective, observing work-related burn injuries, it must be considered that they arise especially from thermal, electrical, and chemical agents[8] and cause great impact for the worker and the health system due to work leave and required care after this kind of accident.

The work environment is among those where there are more burn injuries, precisely one-third of all such injuries, affecting mainly young adult males.[8-10] Studies focused on knowledge of the circumstances surrounding work-related burn injuries from the workers' perspective may contribute to identification of the main risks/stressors for these accidents[9] and the detection of appropriate prevention measures to reduce these injuries, which is the relevance of the present research.[10]

In order to analyze the perception of workers who suffer burn injuries regarding environmental risk, the Neuman Systems Model,[2] proposed by Betty Neuman in 1970, was used as a theoretical framework. This instrument enables conceiving of the client as a multidimensional being in constant interaction with his environment and the owner of complex protection systems, that is, with protection lines acting toward environmental stressors. These protection lines are composed of five variables (physiological, psychological, socio-cultural, developmental, and spiritual), which constitute the basic structure and the protection line of each individual and who may have their response (defense) affected toward a possible or actual presence of environmental stressors.[2]

Environmental stressors are presented as intrapersonal, interpersonal, and extrapersonal. Taken as forces or stimuli present in the internal and external environment of the client, they have the potential to disrupt system stability, causing physical diseases, as well as emotional and social crises,[2] including work accidents.

These stressors present variation related to the impact on and reaction of the client; they may occur simultaneously and act within the five variables of the system. The intrapersonal stressors include the five variables that comprise the client system, that is, factors that arise within the system, such as fear and anxiety. The interpersonal stressors are taken as forces that occur among the individuals, for example, the family and work processes. Also, the extrapersonal stressors are considered forces that occur outside the client system but act on it, such as unemployment. It is important to know the impact and significance each stressor has for the client in order to help him to protect his system and maintain his well-being.[2,11]

As for people who have suffered occupational burns, the central focus of the analysis is the worker who has suffered an imbalance in his protection system in his constant interaction

with workplace stressors, becoming the victim of work-related burn injuries. The burn will occur when the defense lines are not enough to protect him from the disturbance caused by the stressors.[2]

Based on the above-mentioned, we adopted for the present study the following guiding question: What is the perception of workers who have suffered occupational burn injuries regarding the risk of this event? For this reason, we defined as our objective to comprehend the workers' perspective regarding the risk of burns in the workplace, accordingly to the Neuman Systems Model.

METHOD

This qualitative study was conducted in a Burn Care Reference Center located in the state of Rio Grande do Sul, Brazil. The participants were selected according to the following criteria: individuals over 18 years old who suffered work-related burn accidents, received hospital assistance in the reference center between June and October 2012, regardless of gender, etiologic agent, burned body surface, and injury degree; with the ability to communicate in Portuguese; who agreed to take part in the study; signed the Terms of Free and Informed Consent (TFIC); and were close to the time of hospital discharge. In view of these aspects, six subjects took part in the study.

The participants were identified with the help of the nursing staff of the reference center, contacted, and invited to take part in the research on a date prior to hospital discharge. They were informed about the objectives of the study and asked to sign the TTFIC in duplicate. Their consent was also requested to record the interview electronically, privately, and individually in the reference center. Data collection took place between June and October 2012.

Preceding the interview, information was collected about workers' characteristics, such as: gender; age; color/race; marital status; number of children; education; occupation and employment status; as well as data concerning the burn causes, that is, etiologic agent. Subsequently, a semi-structured interview was conducted and the subjects were questioned about the activities they performed at work (for example, handling of thermal equipment and agents), organization processes (such as working hours and workplace), the presence of accident stressors/risks, and aspects that could have favored the burn occurrence.

For interview data analysis, the content analysis technique was used.[12] First, we conducted an alternating reading of the interviews, and the content was organized according to the objectives of the study. Subsequently, successive and exhaustive readings were carried out and the contents were code and categorized, allowing us to identify the stressors that contributed to the burns for the study subjects. Three categories were named: intrapersonal; interpersonal; and extrapersonal stressors. Finally, the third step consisted of treatment and interpretation of the results in accordance with the adopted reference.

The study was previously approved by the Ethics and Research Committee of the *Santa Casa de Misericórdia de Porto Alegre*, the institution where the data were collected, under protocol n. 004/2012, in accordance with the ethics principles established for research with human beings of National Health Council (Brazil) Resolution n. 466/12. In order to ensure the participants' anonymity, they were identified by the letter ''I" for Interviewee, followed by a number signifying the sequential number of the interview (for example: I1)

RESULTS

The speech analysis is presented below, based on the Neuman Systems Model,[2] preceded by a brief presentation of the participants.

The six workers were adult males aged 21 to 40 years. As for the race, four described themselves as white and two as black. One worker had not completed the first grade, another had completed primary school, and the remaining four had attended and completed high school. Regarding marital status, four participants had a partner and two were single, with the number of children ranging between none and three.

Referring to occupations, two were welders; one was an electrician, one a furnace operator, one a truck driver, and one a baker. The employment status of four of the subjects was characterized as a formal job; two conducted their labor activities within the company, and other two were subcontractors. Two subjects worked informally. The burns were caused by fire, explosion, and electricity respectively.

Intrapersonal stressors

The speech content analysis allowed an understanding of the subjects' perspective concerning the accident risk in the workplace and handling work tools. Thus, the risk visibility may be seen as an intrapersonal stressor, with which the workers live daily: [...] *in the factory you* [I] *work, me and my colleagues are at risk* [...] (I3). *I worked with a truck for twenty years and I always dealt with diesel oil and lighter* (I5). *The industrial area* [...] *is very dangerous for those without experience. In a vertical work, there are a thousand and one risks. Unexpected things happen* (I6).

Previous experience, either their own or other workers' related to accidents are major factors in the perception and interpretation of the risks and consequences to their health and can be considered as stressors: [...] *some colleagues have been burned with sulfuric and phosphoric lines. It happened to a colleague; he went out for a coffee and sulfuric line burst. Picture it got in his face. Lost it all in pieces!* (I3).

Participants did not deny the existence of risk in the work environment and performance of their jobs. It was possible to observe, through their statements, that the behavior adopted towards these risks, based on internal forces, proved to be an intrapersonal stressor: *Every site* [in the company] *is dangerous, depending on your awareness, ability, and training* (I3). *I got tired of working with fire. I know it's wrong, but you know, I never had any problem* (I5). *It involves a lot of negligence by the employee. We are encouraged to arrive in the service area and analyze the risks* (I6).

However, denial of the risks in the handling of working instruments also emerged in the statements and may be interpreted as an intrapersonal stressor that can lead workers into situations that weaken the system of protection and to the occurrence of work-related burn accidents: *The* [electric] *power is like that, the wires are there and you do not know whether it is on or off* (I1). *I have always been cautious, especially when turning on gas oven* [...], *but not with a wood stove and normal fire. I never thought that could happen; I was more cautious with gas stove than with wood stove* (I2). *You can never let it* [furnace] *disarm because it is dangerous.* [...] *If it disarms, comes everything* [fire]. [...] *So, how to control it?* [...] *How do you do it in an enclosed space? So, you always have to pay attention* (I3). [...] *I know how the gas is; I would never work with fire knowing you have a flammable thingy* (I6).

Interpersonal stressors

The intense pace of activity and work demands were expressed by workers as elements that favor the reduction of their safety in the labor environment, subjecting them to risk exposure because they weaken their and their colleagues' protection system in the performance of their functions. These two elements are therefore considered interpersonal stressors: *It is very overworked; my hours are very complicated!* (I1). *It's always rushed. The life of a baker and a candy maker is very rushed, to deliver everything on time, to satisfy the customer* (I2). *It's tiring. It's an exhausting journey. It's not easy* [...] *on the body; it has to strain* (I4). *As I am welder, I cannot be pressed, because the service has to come out slowly.* [...] *I cannot work fast* [...] *under pressure, my work will not be perfect* (I6).

The intensity and excess workload resulting from the demands and work organization were also reported by interviewees and can be considered interpersonal stressors that contribute to increasing the risk of a burn.

There was a storm and we've been working more than 12 hours a day for three days. I was pretty tired and we were working for 14 hours [...]. *The accident happened around 1 a.m.* [...] *We had started at 8 a.m.* (I1). *It was rushed, because it was Saturday.* [...] *We had plenty of orders to deliver. We stayed in the rush to get things ready and then we had to assemble* […] *I remember I had fifteen pies to deliver, at different times* [...] *two thousand breads to make* [...] *fifteen thousand pastries. So it was pretty much intense, especially early, to spare time.* [...] *I went there* [bakery] *at 4 a.m.* (I2).

Workers also mentioned that the performance of activities under constant stress may be considered an interpersonal stressor triggered both between the subject and his colleagues as well as with his supervisors and between the subject and his work equipment, as can be seen in the following testimonies: [...] *I work calm, without pressure; all they* [manager] *ask me, I do!* [...] *But if I am under pressure, I charge them. "How are you going to charge me for equipment if it does not give me working conditions?"* [...] *Sometimes there are stressful things* (I3). *A hose burst here, a hose burst there. They were not serious stuff, but bothering you.* [...]

Little things day to day, but that sometimes stresses you. [...] *You were well, realizing you would work and it* [truck] *played me a trick* [...]. *But with persistence* [...] *this accident happened* (I5).

The submission to head decisions may be considered as an interpersonal stressor and factor influencing the workers' decision to "passively" take on labor activity risks, according to reports: [...] *when it was close to midnight* [...] *I was tired. And he said to me "there is one more task for you to do." The boss orders and, indeed, the employee obeys. Some things are very critical.* [...] *You must think very carefully before doing things, analyze well, and sometimes impose yourself* (I1). *It lacked just one detail to do and he* [charge] *did not leave and told me to do it there. He commands!* [...] *He said, 'Leave this later and do it here.' And there is no way to say no* (I4). *I said to my boss, 'I do not want to go travel with this truck anymore!'* [...] *Then he said, 'Will you let me down?* [...] *At least until the end of the month, then I'll try to get another driver.'* [...] *I had a bad feeling, but then he would be speaking* [...] (I5).

Extrapersonal stressors

According to the workers' perspective in this study, the risks inherent to the task would be considered extrapersonal stressors for acting outside the system (external environment) and not being controlled by them: *we were doing maintenance on the road network* [...] *we are always afraid, always afraid* [...] *it is a very dangerous job. You are continuously in traffic; you are directly in contact with the* [electric] *network* (I1). *I am a furnace operator; I am responsible for having temperature in the product. I am the "bomb guy"* [...] *because I work with a high temperature and steam* (I3). *I am a person who welds* [...] *you work near the fire* (I6).

The presence of old, repaired, or equipment whose quality is unknown by the employee occurs as an element that will increase the risk of accidental burning due to possible equipment failure, and is considered another stressor from the external environment of the subject, that is, in the extrapersonal stressors category.

It's a large company! The equipment is all ancient, all tinkered with. [...] *They are big, expensive pieces.* [...] *It* [the furnace] *is damaged* [...] *Have you already realized direct heat and heat?* [...] *You have to be more careful! For over fifty years, they refurbish* [...] *tinker* [...]. *Tinker and the "boat" follows and then dangers happen, because you're fragile. A piece that was 100% is already 50%* [...] *its strength decreases* (I3). *Every electronic device may have faults; it can happen that some hose will break or leak* (I5).

Finally, the perception of risk when handling the tools and work equipment prior to the accident was reported by the participants, and it is possible to consider these as extrapersonal stressors once they occur outside the employee's system, but acting on it: [...] *I asked my colleague: "It is tested? Have you tested* [the grid]*?"* (I1). *I knew there was varnish by the color of the wood* [...] *they should have varnished before, but just before I used it.* [...] *There was a very strong smell of chemicals.* [...] *I think there was some toxic and explosive thing, which exploded at the moment* (I2). [...] *Someone may have used* [the torch] *before and left a lot of pressure and I had not seen it* (I4). *If the torch was not, because there wasn't any smell, I realized it was off* (I6).

DISCUSSION

In analyzing the intrapersonal stressors reported by workers it is important to note that characteristics such as gender, age, race, and aspects such as marital status, education, and number of children are elements that constitute the subjects' physiological, psychological, socio-cultural, and development variables[2] and that are relevant to the decision to take risks in the workplace. Added to this, the fact of the physical, mental, and affective dimensions of each individual influence how they act toward the world,[3] including threatening situations.

In this sense, it is observed that men of the mulatto and white races in productive age and with low education are the most affected by occupational burn injuries.[9] A study among employees of power distribution companies in Iran showed that individuals of working age, who are married, and who have a high education and temporary work contracts, were the most affected by occupational electric injuries.[14]

According to the testimony, the visibility of burning risk situations when handling the work equipment generates fear and apprehension, becoming an intrapersonal stressor, so that the subjects need to pay constant attention when handling the equipment due to the possibility of accidents. The work-hazard relationship creates tension and demands subjective defensive systems

on the part of workers, such as adaptation to the risks and dangers.[15]

Previous experiences of accidents or near-accidents contribute to subjective evaluation of risk situations and remain in the worker's imagination (stressor intrapersonal), increasing the perception of risk exposure, leading him to carry out the activities with strong apprehension, making him more vulnerable to adverse events.[1] Additionally, we must consider those experiences and past situation reports that did not result in accidents. These also contribute to the weakening of workers' protection lines, once the subject develops challenging behaviors based on not believing that an accident has occurred. This challenging behavior, understood as a within-person stressor, exposes the client's basic structure to noxious agent penetration, such as thermal agents.

The perception of risk that does not reliably represent the reality expresses the perspective of workers about dangers they are exposed to in the course of activities and reflects how they think, represent, analyze, and classify the various threats.[6] Thus, each worker interprets the danger in a different way.

The major causes of workplace accidents include inexperience and lack of knowledge about equipment operation, lack of personal protective equipment, failure to adhere to safety regulations, negligence, and aspects related to the lack of security of the work environment and equipment.[10,14] Aspects such as overload, fatality, fault, negligence, and poor working conditions are reported by workers in the hospital environment as the main causes of accidents.[15]

In the study, the long working hours of most participants involve physical and mental overload. Fatigue is reported as causing emotional and mental harm to workers and causes occupational stress.[16] Fatigue and stress situations (stressors) prior to occupational accidents have been reported by some participants, contributing to the invisibility of risks in the manipulation of working tools.

The organizational work method, with regard to excessive workload and the intense pace of activities, leads the subjects to overcome their physiological limits, resulting in overload, fatigue, and inattention, which may contribute to the non-recognition of the risk of accidents, favoring their occurrence. In this sense, it behooves workers and employers to adopt strategies that make the workplace safe. For the employee, it becomes urgent to develop coping behaviors so that the work does not become tiring, so that they can act in order to preserve their physical and psychic integrity.[15]

Through testimonials it can be observed that psychological stress is present in the working process of the participants. It should be noted that stress (interpersonal stressor) can be triggered between the worker and his colleagues/supervisors or between the worker and his working tool. This disruption creates imbalance in the stability of workers' defense lines,[2] with different intensity according to each subject.

The stress generated by the constant need for maintenance/repair of work equipment becomes part of workers' routines[8] (extrapersonal stressor) and it is incorporated as necessary for the performance of work activities, thus "hiding" the perception of risk. Conducting repairs on equipment is part of a process that weakens worker safety, because the machine is not functioning in its normal capacity and its handling demands greater physical and mental effort from the subject who handles it. Among workers at a shoe company, a study identified physical and ergonomic risks in handling the machines, which could jeopardize workers' physical integrity, as for example the possibility of amputation and/or crush injuries.[5]

A study by the Family Health Strategy aiming to identify the perception of workers about the risks they were exposed to at work revealed that professionals perceive risks related to the object, the organization, the instruments, and the product of labor, and these are related mainly to accidents, illness, and emotional weariness.[17] Risk perception can be understood as a set of meanings individually and collectively constructed by the workers themselves that they need to adapt in order to minimize them.[15,17]

The study subjects recognize their roles as being at risk and the danger of accidents is related mainly to handling high temperatures, steam, and electricity, as well as driving vehicles.[7] Exposing subject to such dangers was understood as an extrapersonal stressor in this research, because it involves forces outside the employee's system but acting on the basic structure, causing imbalance.

A study in Canada[8] reveals that occupational burns were caused by direct flame, electricity, scalding, and chemicals, and affected manual laborers, construction workers, electricians, and truck drivers. They also noted that current prevention programs globally can have a big impact on reducing occupational burns and, based on the assessment of burn causes it is possible to formulate appropriate security measures that can encompass several worker and labor sectors considered at higher risks for accidents.[10]

In these reports, it is observed that the proximity to the hazardous situation and the possibility of suffering an accident at work become intrinsic to the employee's function. Thus, the decision to take a risk proves to be part of the daily life of the subject, especially with regard to development activities under precarious security conditions. It is important to emphasize that each individual, depending on their culture or class, has determined a willingness to bear, reject, or ignore the presence of danger.[1] However, it is now known that there are work relationships based on power and hierarchy, leading workers to accept situations that endanger their own lives.[18]

In the worker's imagination, the risk-coping process can be influenced by the fear of unemployment, considered an important extrapersonal stressor.[19] Being unemployed is seen as a higher risk, with the connotation of an inability to fulfill a socially acquired commitment toward the employer, the family, and society. Thus, the fear of losing the occupation causes workers to subordinate themselves to risky situations, even knowing the implications for their health and productivity.[1]

The precariousness of the employment situation may also be considered an extrapersonal stressor, which is an important factor reflected in the individuals' health, because it jeopardizes the working conditions and is reflected in the way workers face and are subject to risks.[18] The fact that the services provided are outsourced, without a formal employment relationship, can lead to a feeling of being unattended by the company and with no rights to claim, for example, provision of personal protective equipment.

The results of this study reveal that, before the work-related burn injuries, workers experienced different situations that weakened their security system and contributed to the occurrence of accidents. It is noted that the reported stressors can be interpreted as intrapersonal, interpersonal, and extrapersonal, all of which impaired the participant's response (reaction) toward the risks present in their work performance.[2]

It is noteworthy that the Neuman Systems Model is an important working tool for nursing professionals in relation to the development of interventions to reduce/prevent the disturbance generated by stressors.[2] Based on this model, the nurse can help workers recognize the environmental risks as well as understand their reaction/response toward environmental stressors and assist them in the maintenance of their well-being.[11]

The nursing work in this area requires the adoption of measures to motivate workers to prioritize security behaviors for their health, mainly through guidelines on risk identification and removal.[20] These actions can be developed with the support of professionals working in medical and safety programs, constituting a strategic tool for the dissemination of health practices to minimize and eliminate exposure to occupational hazards.

FINAL CONSIDERATIONS

The results of this study made it possible to comprehend the risk perspective of workers who suffered work-related burn accidents, based on the Neuman Systems Model. This model allowed the identification of the intrapersonal, interpersonal, and extrapersonal stressors in the environment and in the interviewees' work performance that may have contributed to the burn occurrence.

The subjects revealed that they have recognized the risks they were exposed to in handling work tools and, based on their previous experience, expressed the behaviors they had adopted in view of those risks considered intrapersonal stressors. It is noteworthy that characteristics such as gender, age, race, education, marital status, and presence of children may have affected the subjects' internal forces with which they dealt with risks at work.

The intense pace of activity, excessive working hours previous to the accident, stress, and submission to the employer's decisions

can be considered interpersonal stressors for actions between the worker and co-workers, weakening their protection system and reducing their security. The extrapersonal stressors acting outside the employee's system were seen as risks inherent to tasks using old and frequently repaired equipment, as well as the manipulation of this equipment prior to the accident. Thus, work-related accidents did not occur through direct worker action, but due to forces not "controlled" by him.

The nurse, along with other professionals working in the occupational health area, may help workers to recognize the risks they are exposed to during the course of work activities, as well as the impact and the meaning of each stressor, so that they can act for the preservation of their health and the prevention of occupational accidents.

It is believed that the results of this study can help nurses and other health workers to encourage workers to recognize the risk of accidents, and remain more alert and vigilant to working conditions and compliance with health and safety measures. The results also point to the importance of further research directed toward the analysis of the stressors during work activity performance, because after the accident the perception of workers about the risks have probably changed, making them more aware, unlike individuals who have not yet undergone this experience.

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