



ANALYSIS OF THE PERCEPTION OF OCCUPATIONAL HAZARDS AMONG WORKERS IN A TEXTILE INDUSTRY, MINAS GERAIS, BRAZIL

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ABSTRACT

This study aimed to analyze the perception of workers of a textile factory in relation to environmental risks and possible health problems, aiming to provide reflection-action process among these professionals. It was a descriptive research, carried out from October 2009 to January 2010, in a textile factory, located in a city in the countryside of the state of Minas Gerais, Brazil. Twenty-four employees considered for their respective work shifts, morning or afternoon, and also by their sectors participated in the survey. The workers spoke about the risks they were exposed to and were able to correlate with possible adverse health repercussions. The findings indicated that 25% of the interviewees suffered some type of accident associated with the exacerbation of environmental risks, causing injuries with greater or lesser severity. In another aspect, the workers demonstrated awareness regarding the possibility of the occurrence of long-term occupational diseases acquired. In addition, 29% of the respondents reported having at least one type of pathology, and only one of them reported a pre-existing disease condition at admission to work in the company, while six of them said they had contracted the disease in the beginning of activities in the work sector within the company. It is concluded that the inadequate working environment can be an aggravating factor for occupational diseases, and it is essential to seek continuous improvement in relation to protective measures. It is also important to promote activities related to labor gymnastics and other incentives to promote the quality of life and health of workers.

Keywords: Health; Environment; Worker; Occupational Risks.

1. INTRODUCTION

Work has an important role in the life of man, because, in addition to ensuring financial maintenance, it dignifies life. The right to a working life constitutes a source of personal fulfillment, thus creating meaningful days. Therefore, the importance of work for human beings goes beyond satisfying basic needs, since work is related to the human essence, insofar as it enables a transformative action on the environment and on oneself. In addition, it encourages creativity, externalized through the craft performed (Maciel *et al.*, 2006).

However, conditions favorable to human development can be compromised by the fear of dismissal in the face of

economic instability affecting the productive sector and, consequently, other related sectors (Dutra, 2001).

In this context, occupational diseases have been gaining greater prominence in society. These diseases are caused or exacerbated by risk factors that exist in the workplace, which act as influencers in workers' health (Necker *et Ferreto*, 2006). The same work that is essential for the survival of man has been recognized as an important factor of silent or invisible and acute illness.

Dejours (2002) points out that unfavorable environments cause physical and mental exhaustion to the worker and



stresses the importance of identifying dissatisfaction and anxiety as causes of illnesses and can affect the personality and perception of the function they develop within the work environment. Risky environments are more likely to present sources of danger and can make workers unsatisfied, unproductive and ill, and can lead them to death.

Physical, chemical and biological agents present in a work environment that, due to their nature, concentration, intensity and time of exposure, cause injury and damage to the health of the worker, are considered risk factors related to the work environment (Diniz *et al.*, 2013).

Physical hazards come in the form of energy, such as noise, extreme temperatures, vibrations, ionizing radiation, non-ionizing radiation, cold, heat, abnormal pressures and humidity. Chemical agents are substances or products that penetrate the body through the respiratory system, through skin absorption or even through ingestion of dust, fumes, mists and fogs. Besides these, there are the biological risks that are the viruses, bacteria, parasites, protozoa, fungi and bacilli (Miranda, 1998, Moura *et al.*, 2015).

Incidents relating to machinery, signage, physical arrangement, and others are added to environmental risks. And ergonomic and psychosocial risks, which are related to the organization and management of work, such as incorrect postures, day and night work shift, monotony or excessive work rhythm and other situations inherent to the task, capable of contributing to the musculoskeletal injuries that can lead to work leave on a temporary or permanent basis (Brazil, 2001; Flores *et Szlafsztein*, 2015).

The integrated view of the factors that predispose to illness, as well as the prevention and elimination of these factors, is important so that the company has adequate productivity without endangering the safety and health of its employees (Nadae *et al.*, 2014).

In this context, professionals who work in basic care and health surveillance actions should carry out investigations in the workplace and with workers at home, notify accidents and work diseases, and plan and participate in educational activities in the workplace in the worker's health field (Brazil, 2002, ISHIL *et al.*, 2013).

With regard to home research, the various health problems related to environmental contaminants that can be inserted through social relations are highlighted. In this question, the relevance of the investigation of possible damages to the family from the interaction with workers in unhealthy activities is verified. For example, workers who handle agrochemicals must have their clothing properly sanitized outside the home environment to avoid harm to the health of the population as a whole (Freire *et al.*, 2015).

The *Ministério do Trabalho e Emprego* (MTE - Ministry of Labor and Employment) establishes several technical safety procedures through the Regulatory Norms (RNs). These include RN-9, which establishes the *Programa de Prevenção de Riscos Ambientais* (PPRA - Environmental Risk Prevention Program), aimed at protecting the health and integrity of workers. Horita *et al.* (2015) emphasize that the PPRA should be designed and implemented with the participation of employees. The researchers reinforce that the working life imposes to workers a comprehensive and significant knowledge in terms of the real situations of risk of the work place and the effective participation of these in the construction of the PPRA contributes to the joint responsibility, making them subjects that seek the best health conditions (Horita *et al.*, 2015).

The relevance of this study is understood as a support capable of promoting more effective actions among professionals in the area of worker health, in order to promote strategies aimed at prevention and reduction of occupational risks, as well as providing a vision for joint action (health professionals-assisted workers), and to capture fundamental elements for essential interventions in determining the work process.

The case study analyzed the perception of workers in a textile factory in relation to occupational hazards and possible health problems, aiming to provide them with a reflection-action process.

2. METHODOLOGY

This was a descriptive, cross-sectional study conducted from October 2009 to January 2010. The case study referred to the small-scale textile industry located in the countryside of the State of Minas Gerais, Brazil. The employees totaled thirty-two people and were distributed in different production sectors: preparation, separation, processing, packing, gluing, cutting, administration and cleaning services, plus a workforce of thirty-two (32) employees (Table 1). Occupational activities occurred in the morning and afternoon shifts, with a workday of eight hours a day, except Saturdays, with a four-hour part-time shift, with a one-hour interval for meals.

In this study, the sample population consisted of only twenty-four (24) employees, all over eighteen (18) years of age, and the data collection was done after signing the Informed Consent Form (TCLE) With Resolution 196 of 1996 of the National Health Council (CNS) that regulates research with human beings. As a data collection instrument, a structured form was used to obtain the data of the interviewees: gender, age group, education, sector, shift, work function, time in the company, characterization of the environment, presence or absence of risk in the sector, occurrence of work accident and state of health.



Table 1 - working sector and number of employees.

Sector	Number of employees
Oakum processing	04
Oakum packing and gluing	08
Floor cloths and flannel Cutting	02
Finishing	06
Confection	07
Preparation of rags	03
General Services (Administration and cleaning)	02
Total	32

Data collection was performed in a company room, during the work day, with a duration of approximately 20 minutes. The data collected were tabulated and treated through descriptive statistics and content analysis of the reports. Respondents were identified by the word "Worker", followed by the sector where they work.

3. RESULTS AND DISCUSSION

Twenty-four workers were interviewed; of these, 62% were males aged 21 to 50 years (see Table 2). These data showed that, even today, textile follow-up work is carried out mainly by men. Guiraldelli (2012) emphasizes that even with the transformations in the family structure inherent to the dynamics of modern society, in the home, men remain the main responsible for providing the material necessities of the household components and women are responsible for caring for the children and the house. The researcher points out that this condition prevails even when women have a job in the sphere of production, and this activity is seen as a complement to the family budget.

As for schooling, it was found that 50% (see table 2) did not finish elementary education, while 29% had completed high school. This may show that the factory does not require a higher level of schooling, assuming that its machines are easily manipulated and, despite the majority having a low level of schooling, there was no association between knowledge on occupational hazards and the level of schooling, demonstrating that the worker reasoned and acted according to his knowledge about the reality of the work environment (Soares, *et al.*, 2008).

Among the interviewees, 83% work in the morning shift and only 4% in the afternoon shift (they performed activities in the sectors for preparing and separating of the oakum, in order to speed production for the following day). As for working time, 12% of workers work in the company for a period of one month to one year, 37% work between one year and one month to five years and 50%

for more than five years and one month (see table 2). It was verified that the company presented low turnover of personnel, and this condition was differentiated in relation to the high turnover of personnel detected in several companies of the textile sector as observed by Cobéro *et al.* (2013). The peculiar condition favors the performance of the company object of this study. The high turnover implies gaps that jeopardize the growth and development of the manufacturing unit. Noronha *et al.* (2007) point out that the knowledge of the routine of the operational procedures and standards allows greater productivity, due to the reduction of time spent, quantity of material or energy consumed.

Table 2 - Socio-professional profile of the workers of a textile industry located in the countryside of Minas Gerais, Brazil.

Indicators	Number of Employees	Percentage
Gender		
Female	9	37%
Male	15	62%
Age Group		
21 to 25 years	2	8%
26 to 30 years	5	21%
31 to 35 years	3	12%
36 to 40 years	5	21%
41 to 45 years	5	21%
46 to 50 years	4	17%
Education		
Complete primary education	2	8%
Incomplete primary education	12	50%
Complete High School	7	29%
Incomplete high school	2	8%
Technical education	1	4%
Sectors		
Oakum preparation and separation	4	17%
Oakum processing	2	8%
Finishing	6	25%
Confection	7	29%
Preparation of rags	3	12%
General Services	2	8%
Shift		
Morning	4	17%
Afternoon	20	83%
Operating time		
One month to one year	3	12%
One year and one month to 5 years	9	37%
Above 5 years and a month	12	50%



The workers reported on the risks they were exposed to and were able to relate the damage these risks can bring to their health. The perception about the harmfulness of the tasks was portrayed by the employees due to exposure to dust, heat, noise and cutting machines. The discourses below illustrate these inferences:

“Environment that needs a lot of attention because of the machines, and it is a sector that is very hot because it is an afternoon shift”(Worker of the sector of preparation and separation of the oakum).

“There is noise in all sectors, so we have to always protect our hearing, as it can lead to deafness”(General Service Worker).

“It is a health hazard because it is a very stressful place due to excessive noise, dust and heat that leads to dehydration (if you don’t drink liquids), headaches, elevation of blood pressure and discouragement”(Clothing worker).

“It is a very risky place where you need to have enough attention to work, because it has dangerous machines and a lot of noise that distracts me.” (Oakum sector worker).

“Place with a lot of dust, which makes me cough, impairs my breathing, causes irritation in the throat and allergy when I don’t wear a mask, and this is the risk that bothers me most”(Worker in the rag preparation sector).

“Stressful place, because it offers several health risks, especially the noise that is constant; even at home I hear the noise of work”(Worker of the confectionery sector).

“It’s a very noisy place and my work is very tiring; I stay up the whole day doing the same thing, besides the fact that this is a very hot place”(Worker of the finishing sector).

“It is a good sector to work, but it requires a lot of physical effort, which damages my back. It is also a dangerous place because of the cutting machine”(Worker in the preparation and separation sector of the oakum).

The ponderations of the employees denoted the perception of occupational risks and the possible health problems capable of producing negative interferences in the quality of work. It is necessary to alert as to the relevance of the periodic exams established in Law 6,514, Ordinance 3.214,

Regulatory Norm 07, whose results should be used to support early interventions, avoiding temporary or permanent incapacitating sequelae. Ramos et al. (2009) warn that, in work environments, it is necessary to watch for the beginning of the changes occurred in workers. Situations in which movements have become slower are considered vital clinical indicators. Mauro *et al.* (2004) and Paiva *et al.* (2014) reinforce that the concrete existence of danger in workplaces can lead to the process of internalization, resulting in a strong decrease in productivity and clinical and behavioral modifications, affecting social interaction and, in this perspective, extrapolating the physical limits of the company.

Table 3 indicates the risks that prevailed in the work environment, which were: noise, heat, dust, stress, incorrect postures and repetitive movements.

Table 3 - Perception of workers regarding environmental risks in a textile company in the countryside of Minas Gerais, Brazil.

Environmental Risk	Number of employees	Percentage (%)
Noise	16	67
Heat	13	54
Poor ventilation	03	12
Dust	21	87
Stress	12	50
Monotonous work	04	17
Accidents with machines	06	25
Physical exertion	03	12
Incorrect postures	13	54
Repetitive movements	14	58

The findings showed that 67% of employees considered the work environment to be noisy (see table 3). Noise, when excessive, is capable of causing considerable damage to the auditory pathways, from the tympanic membrane to regions of the central nervous system. As a consequence of prolonged exposure to a characteristically noisy working environment, noise-induced auditory loss (NIHL) can occur, with fundamental aspects inherent to illness, referring to the characteristics of the noise, i.e. the intensity, frequency, exposure time and nature of noise; and individual susceptibility, related to gender, age and ear diseases. It is important to consider that the worker with NIHL may present intolerance to certain aspects of the environment, such as intense sounds and tinnitus, as well as impaired speech, which may interfere with quality of life and work (Araújo, 2002).

It should be noted that the company, in compliance with the requirements of RN-15, which establishes the occupational limit of 85 dB for every 8 hours of daily exposure and RN-9 determining preventive measures from 80 dB, provides the Personal Protection Equipment (PPE), responding adequately to the requirements of RN - 6, with actions system-



atized through the *Programa de Prevenção de Riscos Ambientais* (PPRA - Environmental Risk Prevention Program). However, noise in industries can have a pronounced effect on worker performance and health, so it is important that issues of noise discomfort are addressed, since the confrontation of the organism with noise can lead workers to suffer from diseases such as stomach ulcer, asthma, digestive disorders, hypertension, headache and irritability, cardiac alterations, sleep disturbance and mental disorder, behavioral alteration and lack of attention and concentration (Brandão *et al.*, 2015).

The heat, indicated as environmental risk by 54% of respondents (see table 3), causes changes in the body, such as: Peripheral vasodilation and sweating, which may result in a decrease in terms of worker's performance and concentration, in addition to more frequent pauses and a greater probability of errors (Neckel *et Ferreto*, 2006). Bitoun (2006) warns that workers with exposure to this type of risk should be guided in the execution of compensatory exercises related to muscle stretching and restorative massages. In addition, they should also be instructed to ingest sugar-free natural fruit juices and/or electrolytes. These measures are important to avoid the onset of sequelae and heat cramps (Wenceslau *et al.*, 2014).

The annoyances associated with dust were pointed out by 87% of the interviewees (see table 3), which indicates the urgency regarding the improvement of air quality in the industrial area. Several studies point to the likelihood of the development of occupational asthma among workers in textile factories. The pathogenesis of the syndrome is not yet perfectly determined, but it is believed that severe mucosal epithelial injury occurs with destruction by inhalation of high concentration of the chemical agent, followed by neurogenic inflammation via ankle reflexes. This specific type of asthma allows the continuity of the worker in the workplace as long as environmental control is ensured with the reduction of irritant levels, and, obviously, the affected worker has to undergo adequate treatment (Rozon *et al.*, 2015).

Another risk was related to stress, which was scored as a factor of precariousness of working conditions by 50% of respondents (see table 3). The phenomenon, when in excess, causes physical and mental problems, resulting in a high level of employee dissatisfaction, compromising their activities and reflecting on the success of the company. Stress can directly interfere with workers' life by altering their acceptable hormone levels and their productivity. Damage to the physical and mental health of the individuals includes disorders such as nervousness, easy irritability, anger impulses, pain in the neck muscles and shoulders, tension headache, sleep disorders, fatigue, precordial pain, palpitations, anxiety, anguish, periods of depression and gastric distress or epigastralgia (Couto *et al.*, 2007).

The early departure from the work environment can also be related to work accidents, as provided in art. 19 of Law no. 8.213/91, "*work accident is that which occurs by the exercise of work at the service of the company or by the exercise of work, causing bodily injury or functional disturbance that causes death or loss or reduction, permanent or temporary, of the ability to work*". Almeida *et al.* (2005) reinforce that work accidents are characterized by a direct interaction, sudden and involuntary characterization, between the person and the aggressor agent, in a given space of time. These events are related to occupational hazards, that is, to the elements present in the working environment capable of causing harm to employees' bodies, which can also trigger occupational diseases acquired in the long term (Almeida *et al.*, 2005).

In relation to work accidents, 25% of the interviewees in the morning shift have suffered some type of accident. There were three cuts from working machines or tools, a fracture, a case of scratches caused by working tools and a case of dislocation in the lower limb. Concerning the presence of some disease, 29% reported having some type of pathology, one contracted before entering work (diagnosis of rhinitis) and six contracted after the beginning of work activities (a diagnosis of sinusitis, a case of disc herniation, a case of Work-related Musculoskeletal Disorders (WMSDs) and three cases of arterial hypertension). The association of physical risks (noise and heat) with arterial hypertension and the chemical risk (dust), associated with rhinitis and sinusitis, could be observed.

The worker affected by WMSD reported a prevalence of pain in the region of the spine and upper limbs. Comper *et Padula* (2014) state that this type of disease reaches a high prevalence in the textile industry, occupying the fifth position in relation to departures longer than fifteen days that imply the granting of benefits based on the evaluation of the medical board of the *Instituto Nacional de Seguridade Social* (INSS - National Institute of Social Security). As an aggravating condition, workers with the WMSD are mostly young people and women. The researchers point out that the complaint is related to organizational factors (excessive work and absence of breaks) and psychosocial factors.

It is the effective exposure to ergonomic risks in conditions that cause obstacles to productivity, occurring at times when there is inadequate planning of the occupational environment. It is important to look at some aspects in order to reduce ergonomic risks. It should be avoided to keep the postures standing and sitting for long periods, prioritizing the positions that allow the natural change of postures (Barbosa *et al.*, 2007). Such postural alternations relieve pressures on the vertebral discs and the tensions of the supporting dorsal muscles, thus reducing fatigue. Therefore, the best posture is one whose work is performed both standing and sitting.



This way, the company improves the work environment by ensuring that its workers can count on adequate space for body accommodation in order to perform their activities with comfort and safety (Silva *et Guimarães*, 2005).

Organizational planning presents itself as a foundation for tackling the problem. Isolated measures are not able to prevent WMSD, and this prevention is related to the identification of risk factors and defense strategies, which should be the result of an integrated analysis between the technical staff and workers, taking into account the knowledge built in the workers' routine (Couto *et al.*, 2007).

Chelini *et al.* (2011) report that continued exposure to environmental stimuli and unhealthy conditions in the work environment, especially chronic stress, is identified as a risk factor of significant importance in the pathogenesis of cardiovascular diseases, such as work-related hypertension.

4. FINAL CONSIDERATIONS

In the present study, it was observed that the workers were able to identify and relate the occupational risk factors to which they are exposed and the damages they can bring to their health, as well as the causes of work disorders and control measures, especially related to them. The company and the workers, based on the awareness of susceptibility, assume preventive behaviors for the non-occurrence of accidents and occupational diseases.

In view of the situations analyzed, lectures on the relationship between health and the environment, specific training on the use of personal protective equipment and maintenance of a program and the improvement of programs of prevention of environmental risks and occupational health are recommended strategies to circumvent the problems found. The team of professionals who make up the specialized services in occupational safety and health has a fundamental role in this context, inserting itself in the perspective of basic care, identifying, together with the participatory collective, the risks, notifying accidents and occupational diseases. Such actions contribute to the environmental awareness in the labor nucleus, having a positive repercussion for the social group.

With this study, we can understand that the work environment, when inappropriate, can be an aggravating factor for occupational diseases. Thus, it is necessary to seek the improvement of the place, as well as the accomplishment of physical and mental activities for the improvement of the quality of life and health of the workers.

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