

Original Research Article

The effects of work on the health of workers from textile hub in a semi-arid region of Brazil

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ABSTRACT

Background: The main activity in the textile hub is to turn fibers into yarn, yarn into cloth and cloth into textile articles for household use. The aim of this study was to identify the occupational hazards in the textile industry.

Methods: This is a transversal descriptive study that took place in the textile hub of Brazil. The environmental risk prevention program (PPRA) of the companies was used to analyse the workers' complaints through their occupational health records and to examine the collected data along with the effects on the worker's health after one year of work. A total of 128 workers took part in this study, with a mean age of 27.2 years. The statistical analysis was performed by using the software SPSS 20.0.

Results: A year after, an increase in leisure time was observed thanks to the workers' monthly salaries, but an increase in hospitalization rate was noted, and hearing loss could also be detected.

Conclusions: Therefore, the health of these workers was affected after one year of work.

Keywords: Business management, Occupational hazard, Prevention, Textile, Worker's health

INTRODUCTION

The work process in textile factories is affected by different occupational hazards. Workers from the production line in a textile factory are exposed to hazards like cotton dust, intense heat, noise, machinery accidents and ergonomic disorders. The magnitude of the hazard and the damage it causes to the worker's health will vary according to everyone, and thus such hazard must be analysed and dealt with. Even when priorities for a sector or category are determined, the analysis and prevention of risks will only be considered when applied daily at the workplace where workers live their own individual experiences. The greater the diversity in work processes and work conditions within a group, the greater the

necessity to consider this heterogeneity and the strategies of workers' organization at workplaces.¹

All the actions taken for workers' health target the active individual in the production process. This area has services geared to the implementation of protective measures regarding workers' health, which aim for the reduction and elimination of sickening factors and deaths resulting from the conditions at the workplace as well as for the improvement in quality of life by means of strategies of enhancement in workers' healthcare. The responsibility for safety and health in a company should be taken on by all company sectors; in other words, managers, health professionals, workplace safety experts and workers themselves are responsible for occupational accident prevention.²

In the regulatory standard (NR) 7 (Occupational health medical control programs-PCMSO), article 7.1.1 establishes that all employers and institutions that admit workers as employees are obliged to elaborate and implement PCMSO in order to promote and preserve the health status of their employees. Therefore, the normative shows that the evaluation of hazards is the employer's responsibility, and it is their legal obligation to evaluate and inform all employees about the risks they are exposed to when in exercise of their functions. The evaluation of occupational hazards is then a fundamental tool for any kind of management system of accident prevention and labor safety. After the identification of the existing risks, control measures can be drawn up so that these hazards can be eliminated or reduced to acceptable levels. However, any sort of evaluation needs to be in constant improvement process. It is not a static process, and so it should be periodically reviewed to identify new hazards and propose changes in the company layout.¹

Keeping all the employees healthy is essential for all employers.^{3,4} The development of programs to promote health for workers is frequently discussed by senior managers in many companies. Thus, all the information provided by health professionals to managers and employees is of utmost importance. Such information should include the overall conditions of the company as well as bring awareness to workers regarding the triggering hazards at the workplace. Therefore, the lack of interest from both parts becomes an individual and collective issue at the same time, bringing as consequences harms and damages to employers and employees.

The textile industry was chosen due to the variety of environmental hazards and occupational disorders observed in this area.⁵ Through the PCMSO, all the complaints of employees found in the occupational health records at hiring were investigated so that they could be compared with their records after one year of work.

Furthermore, this field of activity was also chosen in order to go deeper into health and safety matters according to the PPRA of the company. By doing so, it was possible to identify chemical, physical and ergonomic occupational hazards in positions like seamstress, weaver, warp, bleacher and multipurpose machine operator. When on duty, these workers face several risks that threaten the integrity of their health or suffer accidents when operating machines or any other equipment used for textile fabrication.

Upon comparing both moments (at hiring and one year later), this study aims to find out the reasons for some occupational complaints related to health, disorders and work. The following questions guided the study: What were the occupational complaints and occupational hazards reported at the workplace? How did these issues affect textile workers after one year?

Therefore, the following objectives were established: to identify the occupational hazards in the textile industry using the PPRA of the companies; to analyse the occupational complaints regarding the workers' health according to their positions in the company through their occupational health records; to examine the collected data along with the effects on the workers' health after one year of work. By doing so, the workplace conditions can be reviewed, and companies can search for ways to implement prevention policies in the textile industry and develop health and safety management practices at work.

METHODS

This is a transversal descriptive study that took place in the textile hub of Itaporanga, Paraíba, Brazil. This study was carried out according to all the rules found in the Resolution 466/62, which aims to protect all participants of a study by ensuring their privacy. The current work was submitted to and approved by the ethics and research committee of Fundação Francisco Mascarenhas/Faculdades Integradas de Patos (FIP) under approval number 2.082.836.

Workers from 6 small companies located in the textile hub of Itaporanga were included in this study. Their occupational health records at hiring and after 1 year of work (periodic/dismissal medical exams) were collected.

All participants were selected through convenience sampling. Inclusion criteria comprised the following: (1) workers who remained in the company for at least 1 year; (2) workers who within this time frame had their first medical visit at hiring (pre-employment medical tests) and the second at the last periodic or dismissal visit, totalling 2 visits in that year. Exclusion criteria were workers who did not have an occupational health records at hiring, workers who were considered unsuitable at hiring and those who were dismissed within this one year while the current study was being carried out.

Data collection was performed between May 2017 and January 2018, considering the data provided between June 2016 and December 2017. Data were obtained from the medical records kept by the company responsible for the monitoring of the 6 textile companies. A total of 180 occupational health records at hiring were found, and after screening all of them according to the established inclusion criteria, 128 workers were left given the fact the others did not have occupational records after one year. Thus, there was a loss of 28.9% of the initial population after the exclusion criteria were applied.

The statistical analysis was performed by using the software SPSS 20.0. Data normality distribution was analysed by the Shapiro-Wilk test, and a normal distribution of the variables was observed. Descriptive analysis of the data was carried out with mean, median and standard deviation calculation. McNemar test was used for qualitative variables in a 2x2 contingency table.

In addition, inferential analysis was applied through the data collected from the occupational health records regarding the following information: sex, age, marital status, educational background, physical activity, smoking, drinking, leisure, morbid antecedents, anthropometric data, previous occupation, hospitalization history, medication in use, complaints, exams of head, neck, chest, abdomen, back and limbs. By means of the McNemar test to analyse the correlation level between both moments, data were paired in an Excel table, where the names of workers were written on the lines. Two columns were created: one for hiring and the other for one year later. For all statistical analyses, the adopted significance level was 5% ($p < 0.05$).

RESULTS

From the evaluated companies, a total of 128 workers ($n=128$) were selected. Occupational health was compared at two distinct moments, namely at hiring and after one year working for a textile company. The mean age was 27.2 ± 7.0 years, and most of the participants were males (74.8%), married (51.6%) with incomplete elementary school education (35.9%).

As seen in Table 1, 96.9% of the participants do not smoke, 56.3% do not consume alcoholic drinks, and 54.7% report having leisure time, revealing positive results considering these variables.

Table 1: Descriptive analysis of the clinical data of the sample.

Variables	Moments	
	Hiring, n (%)	After 1 year
Smoking		
Yes	3 (2.3)	4 (3.1)
No	124 (96.9)	123 (96.1)
Ex-smoker	1 (0.8)	1 (0.8)
Alcohol intake		
No	72 (56.3)	69 (53.9)
Monthly or less	39 (30.5)	39 (30.5)
2 to 4 times a month	14 (10.9)	16 (12.5)
2 to 3 times a week	3 (2.3)	4 (3.3)
Occupation prior to textile industry		
No	77 (60.2)	73 (57.5)
Yes	51 (39.8)	54 (42.5)
Physical exam		
Normal	128 (100.0)	128 (100.0)
Altered	0 (0.0)	0 (0.0)
Chest x-ray		
Normal	128 (100.0)	128 (100.0)
Altered	0 (0.0)	0 (0.0)

Among the factors related to work at hiring, 60.2% of the sample stated not having a prior occupation, 100% did not have a history of work-related accidents in their prior occupations and 100% did not have a history of accidents in the previous job. After 1 year, 57.5% said they did not

have a prior occupation and 100% remained without work accident history. No data with significance level for analysis could be obtained.

Anthropometric characteristics of the sample can be found on Table 2.

Table 2: Anthropometric characteristics of the sample.

Variables	Moments			
	Hiring	After 1 year	Hiring	After 1 year
	Median (95% CI)		Mean (SD)	
Systolic pressure	125 (120; 130)	122.5 (120; 125)	-----	-----
Diastolic pressure	74 (70; 79)	75.50 (73.40; 77.60)	-----	-----
Waist circumference	83 (81; 87)	84 (81; 86)	84.5 (8.9)	84.7 (8.8)

Regarding the data on arterial pressure and waist circumference at hiring and one year later, the results obtained were considered normal according to the world health organization recommendations: mean of 120x80 mmHg and 84 cm respectively. The agency establishes that a waistline equal to or higher than 94 cm in men and 80 cm in women indicates a risk for heart disease and hypertension, chronic diseases characterized by high blood pressure in the arteries (maximum and minimum values are equal to or higher than 140/90 mmHg).

Data collected from the occupational health records can be seen on Table 3. When hired, 73.4% of the workers reported not doing physical activities for more than 3 times a week and after one year, 72.7% stated their status remained the same, indicating no significant increase in that topic.

Regarding the aspects related to health at hiring, 88.3% declared not having morbid antecedents, 99.2% did not make use of any medication and 77.2% did not have a history of hospitalization/surgery. The results here found showed that within a year there was a decrease in number of morbid antecedents, a decrease in the use of medications and an increase in number of hospitalizations among workers who were on a medical leave and needed to be admitted at a hospital for the sake of their health.

At hiring, 98.4% of the individuals declared having no complaints about their health, 92.9% did not report pain in the head or neck, 100.0% presented a normal chest x-ray, 98.4% had a normal abdomen exam, 94.5% had no back pain, 98.4% had normal limbs, 100.0% had normal nervous system functions and 99.2% did not present any kind of physical handicap. Upon evaluating the workers

after 1 year, 100.0% had no complaints, 100.0% had a normal physical exam, 85.2% reported having pain-free head and neck, 100.0% presented a chest x-ray without abnormalities, 99.2% had a normal abdomen exam, 91.3% had no back pain, 96.1% had normal limbs and 100% kept normal nervous system functions (Table 3).

Table 3: Inferential analysis of the clinical variables in the study.

Variables	Moments		P value*
	Hiring, n (%)	After 1 year	
Physical activity			
Regular (3 times or more weekly)	34 (26.3)	35 (27.3)	1.000
Irregular	94 (73.4)	93 (72.7)	
Leisure			
No	86 (67.2)	58 (45.3)	<0.001
Yes	42 (32.8)	70 (54.7)	
Morbid antecedents			
No	113 (88.3)	110 (85.9)	0.450
Yes	15 (11.7)	18 (14.1)	
Complaints			
No	126 (98.4)	127 (99.2)	1.000
Yes	2 (1.6)	1 (0.8)	
Hospitalization history			
No	113 (89.0)	98 (77.2)	<0.001
Yes	14 (11.0)	30 (22.8)	
Medication in use			
No	127 (99.2)	122 (96.1)	0.125
Yes	1 (0.8)	5 (3.9)	
Hearing			
Normal	118 (92.9)	109 (85.2)	0.004
Altered	9 (7.1)	19 (14.8)	
Abdomen			
Normal	125 (98.4)	126 (99.2)	1.00
Altered	2 (1.6)	1 (0.8)	
Back			
Pain free	120 (94.5)	116 (91.3)	0.38
Deformity/pain upon effort	7 (5.5)	11 (8.7)	
Limbs			
Normal	126 (98.4)	122 (96.1)	0.12
Pain upon effort/spontaneous pain	2 (1.6)	5 (3.9)	

*McNemar test

DISCUSSION

According to the data regarding physical activity and drinking, the need for the development of intervening actions to reduce alcohol intake and the incentive for physical activity participation is required. A study on textile companies in India strongly emphasizes the need for policies for the successful implementation of a health safety program.⁶ This will bring up key factors like the well-being of workers and ensure top management

commitment concerning healthy and safe work practices. A study performed in India also suggests that improvement in the body mass index (BMI) occurs when individuals work under safe conditions and their income allows to provide for them and their families.⁶ In the current study, after one year at work, some of those workers were encouraged to start a physical activity. Both the health and the quality of life of employees need to be continuously monitored in order to evaluate the risks involved and analyse situations that compromise the well-being of workers. This intervention is imperative, especially concerning alcohol consumption, given the results here found when employees were hired and one year later. The search for ways to stimulate all individuals involved in this process is of utmost importance so that it can be a win-win condition for everyone: for companies, in the production process, and for employees, in quality of life at work. Corroborating Babel et al, health at work is knowing how to deal with health issues related to the job.⁷ The exposition to hazards may negatively affect human health.

To make the above-mentioned scenario come true, the NIOSH total worker health (TWH) program is suggested.⁸ The TWH was created to improve the well-being of the American workforce on behalf of employees, employers and the country. Upon protecting safety and improving health and production, this technique can be applied isolated or jointly with changes in the organizational structure, physical changes at the workplace, educational lectures, incentive to participation among others. These interventions have been affecting many results, including objective measured biomarkers (weight, blood pressure, etc) and self-reported information (changes in behaviour, clinical symptoms, etc).

The results obtained reveal that most of the participants increased their leisure time after one year of work. The relationship between leisure and work is quite controversial in our society.⁹ For a better understanding, it is important to point out that leisure and work are closely related. Although they belong to different spheres, they are dialectically connected. It can be observed that work favors leisure activities since a salary enables individuals to increase leisure time with a resultant improvement in their quality of life.

At anamnesis, regarding the evaluations of the head and neck, some hearing alterations could be noted. When hired, a total of nine workers with altered hearing ability were registered, and one year later this number rose to 19 (p=0.004). Most of the workers from the textile industry presented with some sort of musculoskeletal condition, and the symptoms included pain, tingling or burning sensation, immobility, lack of hand grip strength, bloating and discomfort. The occurrence of these symptoms may vary in intensity and type according to the level of inflammation in the affected area. Thus, it is essential that the alterations related to hearing be investigated and the

effectiveness of programs implemented to reduce these alterations be analyzed in the textile industry. Working on a regular basis has gradually become more demanding in terms of commitment, responsibility and long hours of work. As a result, both the physical integrity and mental health of these workers are affected with time.¹⁰

Concerning hospital admissions, 14 workers informed they had been hospitalized in the period of 2 years prior to the moment they were hired. After one year, this number increased to 30. Physical well-being encompasses good health and energy to fulfill the daily tasks; therefore, it is understood that managers should put health policies into practice.¹¹

In order to obtain complete data, it is important to point out that all complaints workers make should be notified by a qualified professional from the company. By doing so, a direct contact between the health professional and workers can be established at the workplace, and the difficulty workers find when searching for assistance at basic health units can be decreased.

Health evaluation is a fundamental element in health promotion programs at the workplace for the proper planning and development of these programs.¹² As a result, interventions and monitoring regarding individual and organizational progress are made easier.

Workers should be made aware that at the slightest sign of a health problem connected to the workplace, they should immediately search for help so that the issue can be treated properly and fast.

The current study had limitations as to the results regarding health-related answers provided by the participants. Most of them reported being healthy according to standards of normality, which is very vague. Companies should keep better health records that would generate sub-notifications in the results, thus providing more reliable and precise data.

The individuals here evaluated are classified as workers at high health risk. Companies are to be responsible for ensuring safety and well-being, but workers have their share of obligations in following all the directions regarding their health and occupational safety for the sake of their well-being and a good quality of life.

The tracking of occupational diseases is no longer the responsibility of public health services alone. Today, it is also an obligation of companies since a healthy worker is more productive and brings in more profits and fewer complications. Thus, it is imperative that companies stop thinking only about their revenue goals and start promoting health policies in the workplace in a systematic and multi-professional way, bringing well-being and quality of life to their employees.

Occupational hazards in the textile industry were identified by means of PPRA of the companies and the workers' complaints were analysed through their occupational health records so that preventive policies can be implemented in the workplace accordingly. Statistical significance after one year ($p < 0.05$) was observed regarding increase in leisure time. This is an expected result given the fact the income generated by work helps to improve the quality of life and provides leisure time opportunities. On the other hand, there was an increase in number of hospitalization records ($p < 0.001$) and in hearing loss ($p = 0.004$) within a year, showing the significant effects of work on the workers from the Itaporanga textile hub.

CONCLUSION

Regarding the work in the textile industry, it is of utmost importance to develop a plan of actions that enables the identification of health issues related to the workplace. On the one hand, workers should be cared for and treated holistically so that they can be analysed as a whole; on the other, managers should see these actions as an investment, not an expense. By doing so, textile companies will have more productive, healthy workers with better quality of life. Management awareness is necessary to put safety and health preventive measures into practice, and workers should be alerted on the importance of the information precision provided at regular occupational medical visits.

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