

Furniture micro enterprises in a small city in Brazil: work conditions and health

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Abstract. This cross-sectional study aimed to identify the main occupational risk situations and the health complaints in ten micro furniture enterprises. Interviews and field observations were made. Among the 50 employees interviewed, the main complaints reported were carrying weight (20%); being standing all day (18%); exposure to noise (12%); administrative issues (12%); wood dust (4%); time pressure to finish the job (4%). They were exposed to adverse working conditions, different situations and occupational risk agents. These hazards exposures are directly associated to the most frequent health complaints as respiratory symptoms and musculoskeletal problems.

Keywords. work conditions; furniture; micro enterprises; health.

1. Introduction

In 2007 the Brazilian furniture industry had 16,017 establishments employing 225,610 workers directly or indirectly related. Microenterprises and small enterprises account for 98% of establishments in this sector, totalling 61.9% of this formal workforce sector (ABDI, 2009). In 2008, they employed 2.1% of formal employment in the manufacturing industry, the fourth largest in the country (FIESP, 2009). The furniture industry is classified according different raw materials employed, a wide variety of end products and the use, scale of production and production processes. The industry is vertically integrated and has a large number of establishments with few employees. In general, the industry is concentrated in large metropolitan regions, 'centers', emphasizing familiar enterprises with national capital.

Most of these establishments have an average monthly turnover of up to €10, 000 and 91% produce wooden furniture. About 35% of production is sold in Rio de Janeiro, Minas 31% and 13% in São Paulo States. Sales are based on individual suppliers with the final consumer shops that sell to classes C, D and E (lower economic classes).

One of the problems is a high level of default which is attributed to poor work quality of sellers who sell for many enterprises without following up the placement and installation of the products. As for design, 80.4 % did not apply design techniques in developing new products, 88.8 % have no trained staff and 53.1 % say they have no need for training in design.

Among the difficulties found in micro and small enterprises, we highlight the lack of working capital (38.9%); legal troubles (16.1%), difficulty to obtain credit and financing operations (11.9%), difficulties with the bureaucracy (20.7%), excess of requirements for credit (10.0%), high level of work informality.

The production is made for local consumption and for other cities in the region. The production is largely manual, and used some outdated machines to expedite the process. In the city, the small enterprises are constituted of family members, the owners as carpenters (father) and sons that help him. The detection of the risks to which a worker is exposed, associated with the detection and evaluation of health changes observed, is fundamental to investigate the relationship between health and work.

This study aimed to investigate and analyse the risk factors to which workers are exposed, in order to characterize the work conditions and to identify the main risks and diseases.

2. Materials and methods

This is a descriptive study with 50 workers from all ten small productions of the furniture sector located in a small city (in 2010 the local population was 17.161 inhabitants) of Minas Gerais State. The study includes the characterization of the workplace by visits to all enterprises, the profile of the workers, complaints relating to excessive tiredness at work, satisfaction at work and personal life, health aspects. The workers profile, the working conditions and health status were gathered from a questionnaire developed by Monteiro (1996, updated 2010) - "questionnaire with demographic data, working conditions, health and lifestyle - QSETS" applied through individual interviews in the workplace. For data analysis SAS ® 9.2 software with performance of statistical tests and descriptive statistics were used. The study had approval of the Research Ethics Committee (2009).

3. Results

3.1. Profile of workers

All workers were male, 56% were married or lived with a partner, 38% were single and 6% were separated or divorced. Their ages ranged from 15 to 75 years with an average age 33.4 years (SD 13.8) and the average number of children was 1.2 varying from one to four and 46% had no children. For educational level 12% had up to four years of study, 24% less than eight years, 18% completed elementary school, 18% did not completed high school, 26% completed high school and 2% were enrolled in higher education.

The length of time working in the sector ranged from one month to 55 years with an average of 15.7 years (SD 13.1). The shortest time hired was one month and the longest 43.5 years. The average working time for five years or less was 1.8 years, 7.3 years for five and ten years and 22.2 years for more than ten years. People started work life earlier (14 years SD 4.3) ranging from seven to 33 years.

The income salary was US\$ 600 (SD 320), the lowest salary of US\$ 65 and the biggest US\$ 1,500. Among them 22% were owners or partners, 16% owner's relatives, 38% had a formal job and 24% were informal.

Habits: 18% stated tobacco use, on average 19 cigarettes/day; 58% drank alcohol (especially beer and rum) on weekend and holidays. The first time that they drank alcohol ranged from 10 to 26 years old; 52% reported physical activities regularly as playing football, the gym, hiking and cycling.

3.2. Health conditions

Current health compared to other people of the same age: 14% reported that their health was much better; 30% which was better; half reported was the same, 4%, a little worse and 2% much worse.

Main health problems related

Respiratory symptoms (54.2%): Allergic rhinitis (45.8%), sinusitis (2.8%), Tonsillitis (2.8%), asthma (1.4%), bronchitis (1.4%);

Musculoskeletal disorders (13.9%): Low back pain (8.4%), middle upper back pain (4.1%) and musculoskeletal disease (1.4%)

Accidents/Injuries: Amputation of distal phalanges (4.1%), Injury in LL (2.8%), Injury in upper limb (2.8%)

Chronic diseases: High blood pressure (5.6%) cardiovascular problems (1.4%) diabetes mellitus (1.4%)

Skin disorders: allergy (1.4%), *Pityriasis rubra* and feet keratoderma (1.4%)

Mental disorders: insomnia (4.1%), depression (2.8%), migraine (1.4%)

Other: Tinnitus (1.4%), gastritis (1.4%).

Pain episodes:

In the six months: 34% had pain (general); back pain (35.3%) upper limbs (23.5%), migraine (17.7%), lower limb (11.8%) and thoracic region (11.8%).

In the last week prior to the survey: 12% had pain: lower limbs (33%), migraine (33%), upper limbs (16%), back pain (16%) and thoracic region (16%).

Absenteeism related to health troubles: 16% needed to get away one day of work in the last 12 months, 14% stayed away 2-5 days, 2% from 10 to 15 days, 4% of 25 to 99 days and 64% had no need to take time off work any day for health reasons.

Medicine intake: 20% used some: drug therapy for respiratory symptoms, hypertension, cardiac diseases, analgesics drugs, Lubricant Eye Drops and drugs for mental disorders.

Occupational accidents: 6% reported severe injury working with machines without protection (circular saws and router). The most important occurred with two carpenters that reported having had an accident over a year. As a consequence one suffered the amputation of the distal phalanx of the right fourth and fifth fingers and the other, the amputation of the distal phalanx of the right fourth finger and fifth left finger.

Stress: the closer to zero, the higher the stress considering the less than or equal to five points value is reported by 32% workers and 62% more than seven.

Fatigue at the end of the workday: 68% felt tired and discouraged, 30% did not feel tired and 2% felt sometimes discouraged.

Sleep and rest: 96% slept well and have a good rest after a day of work and for 4% that could not sleep well the reasons were personal problems and excessive fatigue. Average daily hours of sleep during the working days was 7.46 hours and during days off was 7.8 hours.

For the body mass index (BMI) the values ranged from 18.7 to 30.7 kg / m² with an average of 24, 8 kg / m²; 60% had normal range, 34% were overweight and 6% obese.

3.3. Work conditions

Woodworkers perform various and complex activities including operation with different machines, in addition to manual labour - necklace, painting, sanding, assembling and installing furniture - for which they often use tools and hand tools for cutting, drilling, measurement, measuring, slotting, scraping, clamping among other activities.

The risks are related to work conditions and ergonomic situations as keeping in extreme postures, use of muscle force, repetitive movements, handling chemicals, exposure to wood dust, noise produced by machinery, and risk of occupational accidents. Only 2% said that they did not lift or carry weight in anytime. There is no mechanical assistance for the transportation of wood or furniture.

The physical conditions of the workplace were precarious. It was detected that the

companies visited did not meet the minimum standards of safety, organization and cleanliness. All joinery worked in makeshift locations where there was no proper air circulation.

The workday had a duration of ten hours from Monday to Friday and the journey went from 7am to 18pm, with one hour lunch break (from 11am to 12 hours). On Saturdays it starts at 7am and ends at noon. Besides the lunch time, workers take one break at 15pm for coffee lasting 15 minutes.

During visits it was observed the use of organic solvents, some synthetic resins, sealants, glues, paints, varnish and other products.

The lighting was inadequate in all local visited which can lead to decreased visual acuity of workers and increase the risk of accidents while using machines and hand tools, such as hammer, saw, drill etc.

Even if personal protective equipment (PPE) cannot be considered the best way of protection, their use can avoid accidents and injuries; among workers only 42% reported their use; the type were protective eyewear and hearing protection (62%), shade (38%), gloves (33%) and the helmet (5%) but not throughout the workday because they feel uncomfortable. The masks had no filter and were impregnated by dust. Earplugs were not for personal use and not sanitized.

There was no kitchen or proper place for having meals, nor place to rest at their break time.

86% reported being exposed to the noise of the machines throughout the workday and 12% for almost all the time and 70% were handling chemicals.

Main complaints about the profession were carrying weight (20%), working on your feet all day (18%), exposure to noise (12%), administrative issues (12%), all in general (6%); sanding wood (4%), pressure to finish the job (4%); repetitive movements (2%); handling chemicals (2%); errors in the production (2%), delivering furniture at home (2%); going to work on foot (2%) and 12% said nothing.

In their job 44% liked everything in general, 22% liked the interaction with co-workers, 20% only the payment, 4% delivery furniture at home, 4% wood cutting, 2% assembling furniture, 2% like the entire process of production and 2% said that they did not like anything.

For job satisfaction 32% said they were very satisfied, 58% satisfied and 10% reported being neither satisfied nor dissatisfied and satisfaction with personal life, 44% were very satisfied, 48% satisfied, 6% were neither satisfied nor dissatisfied and 2% were dissatisfied.

The workers were exposed to various hazard risks. It was observed that 24% worked standing almost all the time and 68% worked in walking throughout the workday. In addition 20% repetitive movements performed all the time and 36% for almost all the time.

4. Discussion

It was observed that respiratory symptoms were the most frequent which may be related to prolonged exposure to wood dust and chemical compounds.

Rongo et al (2002) concluded that “working in the small-scale wood industry in Tanzania is associated with an increased prevalence of respiratory symptoms”.

Moreover also symptoms related to musculoskeletal disorders were frequent probably related to the transport of excessive weight, strength to work with wood in machines and prolonged stay in the same position problems and repetitive strain.

For Lipscomb et al (2009) “musculoskeletal back problems remain a common, and consequently costly, source of injury among these carpenters that needs to be addressed through engineering modifications”

These working conditions relate to physical agents such as excessive noise, vibration, local microclimate conditions, chemical agents include handled chemicals, wood dust, biological agents which may be present in the timber as certain fungi. In addition, there are the biomechanical requirements that force to remain in extreme postures and the use of excessive force, repetitive movements. The "layout" for physical space of furniture manufacturing, machinery organization, and tools need to be improved

Also, mechanical agents that produce the risk of accidents must be included as our observations showed and it is consistent with the results of Bamidele et al (2011) that "hand injuries are common among sawmills workers".

Biomechanical factors are responsible for complaints of pain in the upper limbs and trunk reported by woodworkers, and can lead to traumatic injuries as well as muscular-skeletal disorders particularly back pain (cervical, dorsal and lumbar regions).

While only half regularly practiced physical activities and that the average value of BMI tends to value featuring overweight, it is noted that there was a prevalence of an inadequate lifestyle that associated with the adverse conditions of the working environment and the intake of alcohol and / or tobacco use. This becomes an important risk factor for the development of chronic diseases.

There are few epidemiological studies on the health of carpenters, as well as working conditions.

Among the legislation for work conditions the regulatory norm, there are 36 norms for safety and health; Program for Prevention of Environmental Risks (NR-9 and NR15) to detect risks and inadequate conditions in the work environment and the PCMSO - Medical Control Program of Occupational Health (NR-7) and NR 24 for facilities (BRAZIL, 2012).

5. Conclusions

We conclude that the activities are hard and performed under intense physical conditions with high risk of accidents and poor work conditions. Moreover, general structure and constructive aspects are rudimentary. Machines were old, lacking of protection elements and workers are exposed to different situations and agents of occupational hazards, such as a high level of noise, wooden dust and some chemical compounds.

The most frequent perception of health risk situations reported were noise and repetitive movements. The situations identified are directly related to major health complaints referred to the respiratory diseases and musculoskeletal problems. The questionnaire found that despite the strenuous activities and the existence of situations of risk to workers' health, most of them indicated satisfaction with their work, which can be attributed to a good 'atmosphere' and relationship .

Also, provision for good ventilation at work place should be made.

The study highlights the need for public policies and monitoring workers' health, aiming to minimize the existing occupational hazards and hence accidents work. Final results were shared with workers, owners and some professionals' local health system.

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