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Effects of physical activity at work and life-style on sleep in workers from an Amazonian Extractivist Reserve☆

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ABSTRACT

Physical activity has been recommended as a strategy for improving sleep. Nevertheless, physical effort at work might not be not the ideal type of activity to promote sleep quality. The aim of this study was to evaluate the effects of type of job (low vs. high physical effort) and life-style on sleep of workers from an Amazonian Extractivist Reserve, Brazil. A cross-sectional study of 148 low physical activity (factory workers) and 340 high physical activity (rubber tappers) was conducted between September and November 2011. The workers filled out questionnaires collecting data on demographics (sex, age, occupation, marital status and children), health (reported morbidities, sleep disturbances, musculoskeletal pain and body mass index) and life-style (smoking, alcohol use and practice of leisure-time physical activity). Logistic regression models were applied with the presence of sleep disturbances as the primary outcome variable. The prevalence of sleep disturbances among factory workers and rubber tappers was 15.5% and 27.9%, respectively. The following independent variables of the analysis were selected based on a univariate model ($p < 0.20$): sex, age, marital status, work type, smoking, morbidities and musculoskeletal pain. The predictors for sleep disturbances were type of job (high physical effort); sex (female); age (> 40 years), and having musculoskeletal pain (≥5 symptoms). Rubber tapper work, owing to greater physical effort, pain and musculoskeletal fatigue, was associated with sleep disturbances. Being female and older than 40 years were also predictors of poor sleep. In short, these findings suggest that demanding physical exertion at work may not improve sleep quality.

1. Introduction

In recent years, sleep disturbances have been extensively reported in the literature, affecting all age groups. Numerous studies have reported a high prevalence of sleep problems in the general population with rates varying between 10–48% [1–4]. In Brazil, studies carried out in São Paulo city identified a prevalence of objective insomnia of 32% [5]. Moreover, a marked increase in sleep-related complaints was found, such as difficulties initiating and maintaining sleep [6].

Sleep deprivation negatively impacts quality of life, affecting the health of the population, and is associated with increased overweight and obesity, higher risk of cardiac and metabolic diseases, as well as greater risk of accidents in the workplace and higher health costs [7–9]. Studies have highlighted the practice of physical exercise as a factor that can enhance sleep quality and duration and reduce the prevalence of sleep disorders [10–12]. However, it has been suggested that not all physical activities improve sleep quality. Highly intense physical activity may have a negative effect on sleep when it is work-related. Geroldi et al. [13] reported that individuals with an occupational history of low physical effort exhibited better sleep quality compared to workers with physically demanding jobs. These findings suggest that physical activity is a way of improving sleep quality, provided these activities are moderate and taken during leisure rather than demanding and work-related.

Brazil has undergone an intense restructuring of the production chain involving the replacement of human labor by mechanized and technology-based work, where this has had a major impact on the lives of the population. These changes in the work sphere have led to shifts

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in the epidemiologic profile of the workers, with the emergence of new risks to health, such as an increase in neuromuscular diseases, psychosocial problems, among other health issues [14]. Nevertheless, few studies have explored the possible effects of changes in the physical characteristics of work, activity and life-style on sleep quality of workers, particularly in rural regions of the country. In this context, two occupational categories were investigated in this study: 1) rubber tappers, who work in an activity with high physical demand; 2) workers from a factory, who work in activities with low or moderate physical activity.

Rubber tappers are forest workers and dwellers living closely with nature and from which they derive their basic needs. Thus, rubber tappers live off Brazilian nuts, rubber and sustainable lumber and other subsistence-based agriculture (small scale farming) and extractivism (hunting and fishing) [15]. The daily working life of rubber tappers entails vigorous physical activity involving long treks carrying the material collected (latex, Brazilian nuts) and substantial expenditure of energy. Fishing, hunting, playing football and meeting friends were some of the leisure activities observed among rubber tappers. By contrast, factory workers perform more static repetitive activities involving long periods standing and have access to electronic devices (television sets, computers etc.) as a form of leisure, factors that reduce their overall energy expenditure in their daily lives.

The aim of the present study was to assess the effects of physical activity at work and life-style on sleep of workers with high and low/moderate physical demands living on the same Amazonian Extractivist Reserve.

2. Methods

A cross-sectional study of a typical rural population represented by a group of rubber tappers with known high physical workload was undertaken. Another group from a similar cultural background and state of Brazil were represented by factory workers with low or moderate physical workload living in a small town (also in the Amazonian Extractivist Reserve). Thus, the population comprising rubber tappers from the Amazon forest and factory workers of a rubber factory (where the latex was refined into rubber for commercial processing) located in Xapuri, Acre state. The study was carried out between September and November 2011 (Fig. 1) [16].

2.1. Sample characteristic

At the time of the study, 712 rubber tappers were registered at the factory as suppliers of latex. However, during the period of data collection, only 398 rubber tappers had active registrations, i.e. were effectively supplying the raw material. Of this total, 340 workers were interviewed at the places in the forest where the cooperative collects the latex. The remaining workers could not be contacted, mainly owing to difficulties accessing the rubber plantations during the rainy season. The number of rubber tappers interviewed represented 85.4% of the target population of 14 rubber plantations, thereby ensuring representativeness of the sample.

In addition, 160 workers at the cited factory were included, 148 (92.5%) of whom were interviewed. The workers were drawn from the following sectors: packing, electrical testing, maintenance, production, administration and cleaning. Besides the rubber tappers, only the administrative personal used to work in permanent day shift. All the other categories had to work in a rotating shift work.

All interviews took place at the factory during work hours at a venue which provided comfort and privacy. Therefore, the sample is representative and accurately reflects the characteristics of the population studied (Table 1) [17].

2.2. Variables

Data on sociodemographic characteristics, anthropometry (body mass and height), life-style, sleep, self reported morbidities, musculoskeletal pain and occupation type were reported by the workers.

2.3. Sociodemographic data, life habits and morbidity

The following sociodemographic aspects were included: age, sex, marital status and presence of children at home. The variables related to life-style were: smoking, alcohol use and practice of physical exercise outside work hours.

The information on practice of physical exercise was collected through the following questions: “Do you practice physical exercise during your free time? ” (No;Yes); “If yes, which exercises? ” and “How many times a week? ” (once a week, 2–3 times a week and over 3 times a week).

In order to identify the frequency of morbidities, the items from the Work Ability Index (WAI) questionnaire [18,19] were included, collecting information on the occurrence of clinician-diagnosed diseases in the past 12 months.

2.4. Karolinska Sleep Questionnaire

The Karolinska Sleep Questionnaire (KSQ) was used to assess sleep disturbances reported by the workers over the past six months. The

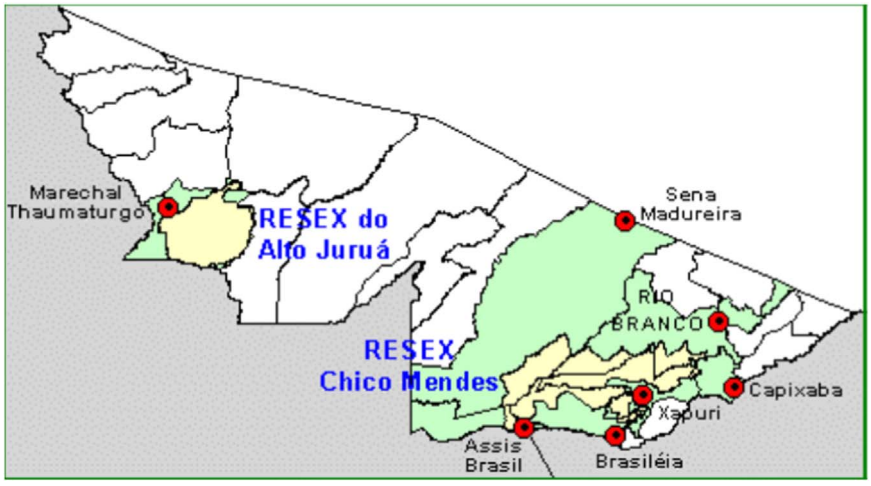

Fig. 1. Map of Acre state and location of the Chico Mendes Extractivist Reserve (RESEX). Instituto Brasileiro do Meio Ambiente e dos Recursos Naturais Não Renováveis [IBAMA], 2006.

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