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RESEARCH

Workers of CEASA: factors associated with fatigue and work ability

Trabalhadores da CEASA: fatores associados à fadiga e capacidade para o trabalho

Trabajadores CEASA: factores asociados a la fatiga y la capacidad de trabajo

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ABSTRACT

Objective: to investigate the socio-demographic characteristics, lifestyle and health conditions related to fatigue and the work ability. **Method**: a cross-sectional study was conducted in 2011 and the sample was composed by 90 workers from the supply center of Campinas. Three questionnaires were used: Fatigue; Work ability index; and socio-demographic characteristics. **Results**: in the univariate regression analysis, the variables associated with work ability were: education, use of medicine, stress, pain in the last six months and pain in the last week. In univariate regression analysis the variables associated with fatigue were: education, stress, sleepiness, pain in the last six months, pain in the last week and health problems. **Conclusion**: these results indicate the need for health promotion program implementation among these workers.

Key words: Fatigue; Work Capacity Evaluation; Life Style; Working Conditions; Nursing.

RESUMO

Objetivo: avaliar características sociodemográficas, estilo de vida e condições de saúde relacionadas à fadiga e à capacidade para o trabalho. **Método:** estudo transversal com 90 trabalhadores da Central de Abastecimento de Campinas, com dados coletados em 2011. Foram utilizados três questionários: Fadiga; Índice de Capacidade para o Trabalho e Sociodemográfico. **Resultados:** na análise de regressão univariada as variáveis associadas a capacidade para o trabalho foram: escolaridade, uso de medicamentos, estresse, dor nos últimos seis meses e dor na última semana. Na análise de regressão univariada as variáveis associadas à fadiga foram: escolaridade, estresse, sonolência, dor nos últimos seis meses, dor na última semana e problemas de saúde. **Conclusão:** existe necessidade de implantação de programas de promoção da saúde entre estes trabalhadores.

Descritores: Fadiga; Avaliação da Capacidade de Trabalho; Estilo de Vida; Condições de Trabalho; Enfermagem.

RESUMEN

Objetivo: evaluar las características sociodemográficas, estilo de vida y condiciones de salud relacionadas con la capacidad de trabajo y fatiga. **Método:** estudio transversal de 90 trabajadores de una central de abastecimiento de Campinas, con los datos recogidos en el año 2011. Se utilizaron tres cuestionarios: fatiga; Índice de Capacidad para el Trabajo y sociodemográfico. **Resultados:** se utilizó las análisis estadístico de regresión lineal univariante y multivariante. Las variables asociadas con la capacidad de trabajo fueron: la educación, el uso de medicamentos, el estrés, el dolor en los últimos seis meses y el dolor en la última semana. Las principales variables asociadas a la fatiga fueron: la educación, el estrés, somnolencia, dolor en los últimos seis meses, el dolor en la última semana y los problemas de salud. **Conclusión:** existe la necesidad de implementar programas de promoción de la salud entre los trabajadores estudiados.

Palavras clave: Fatiga; Evaluación de Capacidad de Trabajo; Estilo de Vida; Condiciones de Trabajo; Enfermería.

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INTRODUCTION

Brazil's Centers Supplies (CEASA) move about 14 million tons of horticultural products annually[1]. CEASA-Campinas alone moves around 56,000 tons of fruit and vegetables per month, distributed in more than a thousand micro, small and medium companies[1]. For the Brazilian economy, this sector is important as it deals with commercialization, contributing to the country's growth. In CEASA-Campinas there are over five thousand direct jobs and about 20,000 indirect jobs[1].

In general, men and women of different ages, from the youngest to the over 60 years, compose the list of people active in this economic sector. Among them, there is a portion of women working in CEASA-Campinas that have musculoskeletal problems, stress and poor working conditions such as lack of organization at work and double shifts[2] which may interfere with the health aspects of these workers.

Young workers often fall into various types of precarious employment as porters, couriers, general assistants, among others. They are usually employed informally and may also have health problems related to the type of function performed[2]. Such working conditions can lead to reduced work ability, which is a process resulting from the interaction of the working characteristics and human resources[3].

The concept of work ability was developed in order to identify, in workers, the risk of imbalance between their health and the work demands[4].

The work ability index – WAI consists of the self-assessment of the work ability in relation to physical and mental demands of the current work. The index is composed of: perception of employees of diagnosed diseases and limitations at work due to illness, sick leave over the past 12 months, the prognosis of the work ability within two years and mental resources[4].

In addition to reduced work ability, occupational activities that require intense physical and mental activity associated with organizational stressors also lead to the perception of fatigue[5]. Fatigue has been studied in workers' health area, and it is a contributing factor to accidents and illness. Fatigue in general is a physiological and psychological phenomenon characterized by feeling of physical and mental fatigue, which is now considered pathological or chronic, with the appearance of sleep disturbances, insomnia, irritability, sadness, difficulty in performing any work activity or not, loss of appetite, and other symptoms[6] affecting the work ability.

In a study conducted in Campinas Supply Center in order to assess work ability, health and lifestyle characteristics among workers from micro and small companies, women had low and moderate WAI categories in higher percentage than men[2].

In this context, working conditions and health aspects of women and young people active in Campinas Supply Center, expose these workers to physical and mental stressors, and may interfere with their ability to work and cause fatigue. Therefore, it is a very important area of study for nursing, given its role in the workers' health area and for the promotion of health in the workplace.

Nursing professionals should recognize the changes that have occurred in the illness process of workers, to enhance interventions to prevent accidents at work and occupational diseases, particularly through intervention in the workplace.

A review of the literature with the objective of knowing the current trends in the implementation of health promotion programs in the workplace showed that investments in workplace health promotion motivate workers, reduce absenteeism and improve performance and worker efficiency. Therefore, it should reinforce the need for nursing professionals to invest in research using workplace health promotion models[7].

This study has the following guiding question: What variables of the socio-demographic characteristics, lifestyle and health aspects influence the work ability and fatigue of young people and women who work at the Campinas Supply Center?

OBJECTIVE

To assess socio-demographic characteristics, lifestyle and health aspects related to fatigue and work ability.

METHOD

Regarding ethical aspects, the project was approved by the Ethics Review Board of the Faculty of Medical Sciences, Universidade Estadual de Campinas. All subjects who agreed to participate signed the informed consent.

This is an epidemiological descriptive cross-sectional study with a quantitative approach, conducted with workers of Campinas Supply Center, from January to May 2011.

The sample was intentional, consisting of 90 active workers of micro and small companies from the Free Markets - FMs, Permanent Sheds - PSs and administration sector at the Campinas Supply Center.

Inclusion criteria were: being a young worker of both genders, aged under 30 and women of any age who agreed to participate in the research.

Exclusion criteria were: being a male worker over the age of 30 years or who refused to participate in the research.

Free Markets are demarcated areas in the ground called stones, which are identified by letters and numbers. In these areas, the products are exposed and the sale occurs. Permanent Sheds are stores with more infrastructure and physical space for the same purposes, with more employees[8].

For data collection we visited 70 companies at the Free Markets (FM 1, FM2, FM3 and FM4) and Permanent Sheds (PS1, PS2, PS3 and PS4), and the CEASA administration sector. The final sample consisted of 85 workers from the supply sector and five from business companies, with response rate of 73%.

Workers were asked to participate in their workplace and, with the permission of the company's leadership, was held brief presentation of the study. From the worker acceptance to participate and signing the consent form, the interview was held, through the following instruments: fatigue questionnaire[9] Work Ability Index[10] and Socio-demographic profile, lifestyle, health aspects and working conditions - QSETES[11].

The Work Ability Index is a Finnish self-administered questionnaire which analyses the concept that the worker has on their own work ability. It consists of seven items totaling ten

questions, which are scored. The final score may vary from seven to 49 points: work ability for the current job compared to the best of life, ability to work in relation to the physical demands of the job, current number of diseases diagnosed by physician, estimated loss defined by the employee due to illness, sick leave from work in the past year, own prognosis of the ability to work in two years time and mental resources[10].

The Fatigue questionnaire consists of 30 multiple-choice questions, self-administered. Later, the answers were converted into numerical values: Always (five points), often (four points), sometimes (three points), rarely (two points) and never (one point). The maximum score is 150 points - more fatigue, and a minimum of 30 points - less fatigue[9].

Data were entered into a database using Excel® and the computer softwares used for the statistical analysis were Statistical Analysis System, version 9.2 - SAS® and Statistical Package for Social Sciences - SPSS®.

To study the relationship of variables related to lifestyle, health aspects and working conditions with WAI score and fatigue, we used univariate and multivariate linear regression analyzes (with Stepwise criteria for variables selection). Numeric variables without normal distribution were transformed into ranks for analysis. The significance level adopted for the statistical tests was 5%, ie, $p < 0.05$.

RESULTS

Regarding socio-demographic profile, most of the 90 workers were female, with a mean age of 32 years (SD 12.8), ranging from 15 to 64 years; married 57.8%; with children (56.7%); and good education - 64.4% completed high school. They were inserted into micro and small companies of the CEASA and occupied various positions, from the leadership to the sales supervisor, salesperson, administrative assistant and general assistant. The employment bond was diverse: formal, self-employed, licensed and casual workers. Most of them performed administrative functions (52.2%) and 60% had formal bonds. As for the work demands, most had mixed demand, ie their occupational activities required both physical and mental effort.

Most participants (55.6%) had adequate work ability, with categorical WAI score excellent; 41.1% good and only 3.3% moderate. The average value of the total WAI of the subjects was 43.9 points (SD 3.2) ranging 34-49 points. The average current work ability assigned by the subjects was 8.6 (SD 1.4), on a scale of zero through ten. The consistency between the variable components of the WAI calculation was assessed using Cronbach's alpha coefficient, resulting in the value of 0.78, which corresponds to the appropriate level of reliability. Overall, the WAI has adequate psychometric characteristics. The internal validity of WAI was demonstrated by Finnish authors, from the association between ratings of health status and subjective results of WAI[12-13].

As for the self-reported diseases, 26.7% of the participants reported sinusitis and 28.9% rhinitis. More than half (56.6%) reported fatigue and sadness at the end of workday.

The variables related to lifestyle, health and working conditions that had significant association with the work ability were: education ($p = 0.041$), use of medication ($p = 0.011$), self-reported stress ($p = 0.005$), pain in the last six months ($p = 0.001$) and pain in the last week ($p = 0.007$) (Table 1).

The variables pain in the last six months and self-reported stress presented significant relation to the value of the WAI score. It was observed that subjects with higher WAI score had had no pain in the last six months ($p = 0.003$) and less self-reported stress ($p = 0.014$). The data are presented in Table 2.

The average fatigue among subjects was 49.3 points (SD = 10.9), with a minimum of 30 and maximum of 85. The average fatigue was greater in difficult of concentration and attention area with 18.7 points (SD = 4.8), followed by sleepiness and lack of willingness to work 15.9 (SD = 4.6) and body fatigue 14, 7 (SD = 4.2).

Lifestyle, health and working conditions variables associated with fatigue in the univariate linear regression analysis were: education ($p = 0.001$), self-reported stress ($p = 0.001$), sleepiness ($p = 0.003$), pain in last six months ($p = 0.008$), pain in the last week (0.001), health problems in the last 15 days ($p = 0.015$) (Table 3).

There are significant relation of the variables education, stress and sleepiness scale score with the value of the fatigue score. Subjects with higher values of the fatigue score had less years of education (incomplete primary education - less than eight years) or higher education (complete high school or incomplete or complete higher - greater than or equal to 11 years), with the lowest score in stress and with greater sleepiness score. (Table 4)

Table 1 - Univariate linear regression analysis to identify sociodemographic, lifestyle, health and work characteristics associated with work ability (N = 90)

Variables	Categories	Beta (SE)*	p value	R^2
Age	Continuous variable (ranks)	-0.12 (0.11)	0.248	0.0151
Gender	Male Female	1,0 1.85 (5.84)	0.752	0.0011
Children	No Yes	1,0 -5.29 (5.53)	0.341	0.0103

Continues

Table 1 (cont.)

Variables	Categories	Beta (SE)*	p value	R^2
Physical activity	No Yes	1,0 8.87 (5.44)	0.107	0.0293
Marital status	Not married Married	1,0 3.46 (5.56)	0.535	0.0044
Education (years)	< 8 8-10 ≥ 11	1,0 18.80 (9.08) 8.56 (7.42)	0.041 0.252	0.0477
Use of Medication	No Yes	1,0 -15.14 (5.85)	0.011	0.0707
Estress scale	Continuous variable (ranks)	0.30 (0.10)	0.005	0.0876
Job satisfaction	Satisfied Unsatisfied	1,0 -14.82 (11.91)	0.217	0.0173
Life satisfaction	Satisfied Unsatisfied	1,0 -13.57 (8.28)	0.105	0.0296
Sleepiness score	Continuous variable (ranks)	-0.20 (0.10)	0.055	0.0411
Health compared	Worse Better	1,0 4.80 (5.53)	0.388	0.0085
Pain in the last six months	No Yes	1,0 -18.54 (5.36)	< 0.001	0.1198
Pain in the last seven days	No Yes	1,0 -15.98 (5.83)	0.007	0.0787
Health problem in the last 15 days	No Yes	1,0 -7.07 (6.58)	0.285	0.0130
Time of work in this company	Continuous variable (ranks)	-0.07 (0.11)	0.518	0.0048
Employment bond	Owner/family Formal Self-employed	1,0 2.64 (6.01) -14.79 (10.34)	0.662 0.156	0.0353
Home tasks	No Yes	1,0 -0.97 (6.22)	0.877	0.0003

** Beta: value of estimated or slope (slope) in the regression line; SE: standard error of beta. R2: coefficient of determination (% variability response of the variable explained by the independent variable). Ref: reference level. Numeric variables transformed into ranks due to lack of normal distribution.*

Table 2 - Multivariate linear regression analysis to the numerical WAI association with sociodemographic, lifestyle, health aspects and work characteristics (n = 89)

Selected variables	Categories	Beta (SE)*	p value	R^2 Partial
1. Pain in the last six months	No Yes	1,0 -15.92 (5.26)	**0.003**	0.1084
2. Stress scale	Continuous variable (ranks)	0.25 (0.10)	**0.014**	0.0613

**Beta: value of estimated or slope (slope) in the regression line; SE: standard error of beta. R2: coefficient of determination.*

Stepwise criteria of selection of variables. R2 Total: 0.1697. Intercept (SE): 40.42 (5.66); p < 0.001. Numeric variables transformed into ranks due to lack of normal distribution.

Table 3 - Univariate linear regression analysis to identify socio-demographic, lifestyle, health and work characteristics related fatigue (N = 90)

Variables	Categories	Beta (SE)*	p value	R^2
Age	Continuous variable (ranks)	0.06 (0.11)	0.598	0.0032
Gender	Male Female	1,0 3.95 (5.85)	0.502	0.0051
Children	No Yes	1,0 -0.79 (5.58)	0.888	0.0002
Physical activity	No Yes	1,0 -7.12 (5.50)	0.199	0.0187
Marital status	Not married Married	1,0 -5.88 (5.57)	0.294	0.0125
Education (years)	8-10 < 8 ≥ 11	1,0 20.55 (8.28) 31.33 (6.45)	< 0.001	0.2157
Use of medication	No Yes	1,0 7.14 (6.06)	0.242	0.0155
Stress scale	Continuous variable (ranks)	-0.37 (0.10)	< 0.001	0.1348
Job satisfaction	Satisfied Unsatisfied	1,0 15.14 (11.97)	0.209	0.0179
Life satisfaction	Satisfied Unsatisfied	1,0 15.79 (8.28)	0.060	0.0397
Sleepiness score	Continuous variable (ranks)	0.31 (0.10)	0.003	0.0982
Pain in the last six months	No Yes	1,0 15.10 (5.51)	0.008	0.0785
Pain in the last seven days	No Yes	1,0 20.09 (5.72)	< 0.001	0.1231
Health problem in the last 15 days	No Yes	1,0 15.98 (6.43)	0.015	0.0655
Time of work for the company	Continuous variable (ranks)	0.15 (0.11)	0.176	0.0209
Employment bond	Owner/family Formal Autonomous/self-employed	1,0 6.91 (6.10) 2.15 (10.50)	0.260 0.838	0.0152
Home tasks	No Yes	1,0 -4.63 (6.24)	0.460	0.0062

** Beta: value of estimated or slope (slope) in the regression line; SE: standard error of beta. R2: coefficient of determination (% variability response of the variable explained by the independent variable). Ref: reference level. Numeric variables transformed into ranks due to lack of normal distribution..*

Table 4 - Multivariate linear regression analysis to identify socio-demographic, lifestyle, health and work characteristics associated to fatigue (n = 89)

Selected variables	Categories	Beta (SE)*	p value	R^2 Partial
1. Education (years)	8-10 < 8 ≥ 11	1,0 23.49 (7.38) 27.70 (5.79)	0.002 < 0.001	0.2122
2. Stress scale	Continuous variable (ranks)	-0.31 (0.09)	< 0.001	0.0854
3. Sleepiness score	Continuous variable (ranks)	0.30 (0.09)	< 0.001	0.0891

**Beta: value of estimated or slope (slope) in the regression line; SE: standard error of beta. R2: coefficient of determination.*

Stepwise criteria of selection of variables. R2 Total: 0.3867. Intercept (SE): 23.82 (7.76); p = 0.003. Numeric variables transformed into ranks due to lack of normal distribution.

DISCUSSION

This study identified that the most active workers in the Supply Center showed great work ability (55.6%), and their work ability should be maintained; 41.1% had good ability and 3.2% moderate, and should be improved. The decreased work ability was associated with self-reported stress and pain by workers. Factors presented in the organization and work environment can configure inadequate mental burden to the worker, therefore, stressful situations at work can have an effect on the reduction of work ability [12].

Most subjects showed mixed work demand, that is, the work required from workers both mental and physical load. Workers had constant involvement in trade negotiations and direct contact with many people during the workday.

In a previous study conducted at the Campinas Supply Center, with truck drivers, stress has been identified as a major problem reported by the subjects, who spent several hours driving, with attention to the traffic, cargo under their responsibility, restricted delivery times, and the risk of accidents[13]. Dutch authors, in a review study on the work ability, found that the high work mental demand was negatively associated with the work ability[14].

In a Finnish study, it was considered that the practice of physical activity can help maintain or restore the work ability, because it favored the reduction of stress, and improve workers self-esteem[12]. In this study, the current average of work ability, as perceived by the subjects themselves in zero to ten scale was 8.6 (SD 1.4). The pain perception of the workers in the last six months and in the last week, as well as use of medications for existing conditions, were associated with decreased work ability.

International studies show that the decrease in work ability is directly related to the individual's health conditions[3-4,12,15-16]. According to a Finnish author, the perception of health status, sick leave and symptoms are also correlated with the work ability[15].

Several studies found that work ability is strongly influenced by variables such as age, sex, and physical activity[2-4,12,15]. In this study, however, these factors were not influenced.

The majority of subjects had 11 years of education or more, which corresponds to have completed at least high school and the education level was associated with increased work ability. According to a Finnish study, increased skills and knowledge by the worker in the execution of their activities, as well as the habit of studying and acquiring skills positively influence the work ability[16].

In this study, fatigue was directly influenced by lifestyle and health factors, such as education, stress, sleepiness, pain in the last six months, pain in the last week and health problems in the last 15 days. In a study with Brazilian workers, fatigue was also associated with self-reported health problems[4]. Swedish authors found that night shifts among nursing professionals was directly related to fatigue and problems related to mental health such as stress, depression and anxiety[17].

Because it is a cross-sectional study, limitations considered are: no cause and effect can be established; there is no possibility to predict how health aspects of these workers will evolve, as they were already there, prior to the study. In addition, a peculiar characteristic of the cross-sectional study is the healthy worker effect, leading to the exclusion of the patient, that is, the most affected workers are unable to maintain their job[18].

The study has brought important implications for application in nursing area, as this practice stands out as an important field of knowledge in development of restoration and work ability maintenance programs, bringing many contributions to workers' health. The research knowledge is an important tool for discussion and the foundation of diseases prevention policies and health promotion in the workplace.

CONCLUSION

Most of the workers studied had excellent work ability. Factors such as education, stress, pain and use of medication were associated with decreased work ability. These results are in agreement with the concept that work ability is influenced by several factors such as socio-demographic, lifestyle and work demands.

As for the perception of fatigue, a considerable part of workers reported high levels of fatigue and factors associated with increased perception of fatigue were stress, sleepiness and educational level. The analyzed results showed the need for interventions in the workplace to maintain work ability and reduce worker' fatigue.

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