Job control, job demands, social support at work and health among adolescent workers

Controle, exigências, apoio social no trabalho e efeitos na saúde de trabalhadores adolescentes

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Keywords
Adolescent. Child labor. Stress. Stress, psychological. Accidents, occupational. Sleep, physiology. Adolescent health. Working conditions. Work hours. Occupational health.

Abstract

Objective
To evaluate physical and psychological dimensions of adolescent labor (such as job demands, job control, and social support in the work environment), and their relation to reported body pain, work injuries, sleep duration and daily working hours.
Methods
A total of 354 adolescents attending evening classes at a public school in São Paulo, Brazil, answered questionnaires regarding their living and working conditions (Karasek's Job Content Questionnaire, 1998), and their health status. Data collection took place in April and May 2001. Multiple logistic regression analysis was used to determine relations among variables.
Results
Psychological job demands were related to body pain (OR=3.3), higher risk of work injuries (OR=3.0) and reduced sleep duration in weekdays (Monday to Thursday) ($p<0.01$). Lower decision authority in the workplace ($p=0.03$) and higher job security ($p=0.02$) were related to longer daily working hours.
Conclusions
It was concluded that besides physical stressors, psychological factors are to be taken into account when studying adolescent working conditions, as they may be associated with negative job conditions and health effects.

Descritores
Trabalho de menores. Estresse. Estresse psicológico. Acidentes de trabalho. Sono, fisiologia. Adolescente. Saúde do adolescente. Condições de trabalho. Jornada de trabalho. Saúde ocupacional.

Resumo

Objetivo
Avaliar as dimensões físicas e psicológicas do trabalho de adolescentes (demanda de trabalho, controle no trabalho e apoio social e ambiental), relacionando-os a relatos de: dores no corpo, acidentes de trabalho, duração de sono e duração diária da jornada de trabalho.
Métodos
Participaram do estudo 354 estudantes do período noturno de escola pública no Município de São Paulo, entre abril e maio de 2001. Esses, responderam a questionário sobre condições de vida, trabalho (escalas Karasek de controle no trabalho) e estado de saúde. Foram feitas análises de regressão logística múltipla a fim de determinar a relação entre variáveis.

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Resultados

As exigências psicológicas mostraram-se associadas aos relatos de dores no corpo (OR=3,3), maiores riscos de ocorrência de acidentes de trabalho (OR=3,0) e redução da duração do sono durante os dias de semana (segunda a quinta-feira) (p<0,01). Baixa autoridade de decisão (p=0,03) e maior segurança no emprego (p=0,02) estão relacionadas à maior duração da jornada diária de trabalho.

Conclusões

Concluiu-se que não somente os estressores físicos, mas também os psicológicos devem ser levados em consideração quando avaliadas as condições de trabalho de adolescentes, já que esses podem ser associados às más condições de trabalho e efeitos negativos na saúde.

INTRODUCTION

Efforts for abolishing child labor around the world face a harsh reality. According to the International Labor Organization (ILO),[11] about 351 million people under 18 years old are estimated to be economically active. Among these, about 211 million are under 15, which is under the age established by the ILO Minimum Age Convention, 1973 (No. 138). ILO standards also establish that "admission to any type of employment or work which by its nature or the circumstances is likely to jeopardize the health, safety or morals of young persons shall not be less than 18 years". About 170 million adolescents under 18 have hazardous jobs. Brazilian laws are even stricter: the minimum age for working is 16 years old. But, according to the Brazilian Institute of Geography and Statistics (IBGE),[10] about 2.3 million adolescents aged 15 to 18 years old are both working and studying, and a million only work.

Adolescent labor is a controversial subject and there is a broad range of opinions about its positive and negative consequences on child development. Several authors list benefits to the adolescents' development.[5,7]

However, there are several aspects that may be hazardous to the adolescents' health and development. Among these factors, job tasks that exceed the adolescents' stage of development may be a primary factor that is mostly related to hazards to health. During and since the industrial revolution, many children and adolescents have been exposed to working conditions that are not appropriate to their development, and that may even be considered inhumane due to the type and intensity of job demands made of these young workers.

Despite the efforts of the Brazilian government for abolishing child labor and establishing strict laws for adolescent labor, laws regarding minimum age for labor are often not observed, especially in rural areas where it is especially difficult to enforce them. A previous study of adolescent labor in rural areas showed that the frequency of injuries reported by working adolescents was dramatic: almost half of them suffered some sort of work injury. Those injuries were often related to job demands not appropriate to young workers.[6]

However, adolescent work is not exclusive to rural areas. Child and adolescent work is also found in major Brazilian cities such as São Paulo, Belo Horizonte, Porto Alegre, Goiânia, Belém, and Recife. It was also found that the work of those children and adolescents was related to worse achievements in school.[4]

The psychological factors involved in adolescent work must also be considered. For the last 30 years, the psychological factors related to the work environment in adults have been studied, with notable findings regarding job demands and job control and their relationship to physical illness such as cardiovascular diseases and psychological symptoms.[3-15]

As part of this continuing research was the development of the Job Content Questionnaire[12] (JCQ), based on the demand-control model of job strain, in which those workers who have high psychological demands but low decision authority are considered to be in a high-strain job.[12,13] Workers in high-strain jobs have an increased risk for the development of cardiovascular diseases.[20] Later, another dimension, social support, was added to the theory.[13] Studies regarding job demands, job control, and musculoskeletal symptoms[9] reported associations not only between musculoskeletal symptoms and psychological job demands, but also found that psychological job demands were related to high levels of physical exertion on the job. Araújo et al[2] evaluated psychosocial aspects of the work performed by female nurses. Results showed a significant association between job control and psychological distress.

The relationship between job demands, job control, and adverse health effects has not been adequately studied in young workers. As part of the evaluation of job demands, psychological demands must be considered since high psychological demands may be as hazardous to health as physical demands. The purpose of this study was to evaluate the relationship between job demands, job control (both physical and psychological) and body pain, work injuries, sleep duration, and weekly working hours.

METHODS

The study was carried out in a public school of a middle class neighbourhood in the city São Paulo, Brazil. The school was selected because of its close proximity to a major business area, and because it is a prestigious public school of São Paulo where the effects of work among students have not been studied. From a total of 413 students attending school in the evening period (7 p.m. to 10:30 p.m.) during April and May 2001, 354 participated in this study (85.7%). All students between 14 and 18 years old at the time of the study were invited to participate. Those not interviewed (n=59, 14.3%) included 27 students who dropped out of school, 24 who were transferred to another school, four who did not attend all classes, and four who refused to participate.

The students answered three questionnaires on:

1) Demographics (age, sex, marital status, family income, family members living together); living conditions (sleeping quarters, quality of neighborhood residence, commuting time to school and back home); lifestyle (smoking, alcohol drinking, exercising, leisure activities); schooling (quality of school environment, school attendance, attention during classes, extra-class activities); sleep (sleeping times during weekdays and weekends, sleep symptoms, sleepiness at work and at school, quality of sleep, reported sleep disturbances); and

Table 1 - Reported body pain and associated variables according to Job Content Questionnaire (JCQ) scales.

JCQ scales and demographic variables	Scores	Body pain N	Body pain %	p-value*	Crude OR	95% CI (COR)	Adjusted OR***	95% CI (AOR)
Skill discretion**	12-26	23	64	0.957	–	–	–	–
	27-32	50	67					
	33-46	47	65					
Created skill**	3-7	27	71	0.674	–	–	–	–
	8	26	67					
	9-12	67	64					
Decision authority**	12-24	19	68	0.959	–	–	–	–
	25-28	33	65					
	29-48	68	65					
Decision latitude**	32-56	28	62	0.541	–	–	–	
	57-64	42	71					
	65-88	50	63					
Psychological job demands**	18-28	38	56	**0.051**	1.0	–	1.0	–
	29-32	39	66		1.5	[0.8; 2.7]	1.7	[0.9; 3.4]
	33-48	43	77		3.0	[1.6; 5.7]	3.3	[1.6; 6.7]
	Don't work				1.0	[0.5; 2.0]	1.1	[0.4; 2.2]
Job insecurity**	3-4	42	58	0.196	–	–	–	–
	5-11	68	72					
	12-22	10	62					
Total psychological stress factors**	<-1.0	20	49	**0.036**	–	–	–	–
	-1.0-+1.0	97	70					
	>+1.0	3	75					
Coworker support**	5-10	33	73	0.442	–	–	–	–
	11	27	64					
	12-16	60	63					
Supervisor support**	4-10	25	66	0.630	–	–	–	–
	11	15	75					
	12-32	80	64					
Physical exertion	1	14	64	0.719	–	–	–	–
	2	54	69					
	3	45	64					
	4	7	54					
Sex	Male	96	52	**<0.001**	1.0	–	1.0	–
	Female	100	76		2.8	[1.7; 4.6]	3.1	[1.8; 5.3]
Alcohol use	No	149	58	**0.004**	1.8	–	1.0	–
	Yes	47	80		2.8	[1.4; 5.6]	2.6	[1.2; 5.5]
Fatigue	Don't feel any	20	36	**<0.001**	1.0	–	1.0	–
	Eyes	22	59		2.6	[1.1; 6.2]	2.3	[0.9; 5.8]
	Body	83	62		3.0	[1.6; 5.7]	2.9	[1.5; 5.9]
	Mental	13	62		2.9	[1.0; 8.2]	2.6	[0.8; 7.9]
	Multiple	58	85		10.4	[4.4; 24.8]	8.5	[3.4; 21.0]

OR: Odds ratio; CI: Confidence interval; COR: Crude odds ratio; AOR: Adjusted odd ratio
Hosmer-Lemeshow test p=0.474
*p-value of Chi-square test
**In tertiles
***Adjusted by: sex, alcohol use, fatigue

health symptoms (body pain, medication use, reported morbidity, tiredness).

2) Body pains (modified version of Kuorinka[14]): all the students reported whether they felt any pain in the body in the last year and in the last week. If they did, they marked in a human body figure where they felt pain, and reported whether their jobs caused or contributed to aggravate it.
3) Working conditions: age and reasons for entering the workforce, workplaces (present and past), work interference with school and extra-class activities, work benefits, tasks performed, job control and job demand dimensions, safety and health hazards. This last questionnaire was only answered by those students who reported currently working or being unemployed at the time of data collection. Unemployed students reported information about their last job.

The JCQ[12] was used to evaluate the dimensions job control and job demands. The original questionnaire was in English language and it was validated by their authors.[12] It was translated into Portuguese using the back translation procedure – the original questionnaire was translated to Portuguese, then the Portuguese version was translated back to English by someone not involved in the first translation. Then, the second translation was sent to the main author who approved the translation. Internal consistency (overall Cronbach's alpha) of all four sub-scales was estimated at 0.696.

The JCQ consisted of 48 questions about the work environment regarding workers' tasks and their relationships with other coworkers. The answers of these questions were used in two major scales: decision latitude (scores from 24 to 96), and total psychological stressors (scores from 15 to 65). Each of these scales comprised other subscales. The decision latitude scale comprised the decision authority (scores from 12 to 48), skill discretion (scores from 12 to 48) and created skill subscales (scores from three to 12). The total psychological stressors scale comprised the psychological job demands (scores from 12 to 48) and job insecurity subscales (scores from three to 17). The results of the total psychological stressors were Z-scored following the instructions of the questionnaire's author. The supervisor support (scores from four to 32) and coworker support scales (scores from four to 16) were also used.

One of the questions, which is considered as a scale per se, relates physical exertion in the workplace. Answers ranged from one to four.

Table 2 - Reported work injuries and associated variables according to Job Content Questionnaire (JCQ) scales.

JCQ scales	Score	Work injuries N	Work injuries %	p-value*	Crude OR	95% CI (COR)	Adjusted OR***	95% CI (AOR)
Skill discretion**	12-26	7	19	0.645	–	–	–	–
	27-32	14	19					
	33-46	18	25					
Created skill**	3-7	9	24	0.915	–	–	–	–
	8	8	20					
	9-12	22	21					
Decision authority**	12-24	7	25	0.511	–	–	–	–
	25-28	8	16					
	29-48	24	23					
Decision latitude**	32-56	9	20	0.285	–	–	–	–
	57-64	9	15					
	65-88	21	26					
Psychological job demands**	18-28	9	13	**0.020**	1.0	–	1.0	–
	29-32	11	19		1.5	[0.6; 3.9]	0.9	[0.3; 2.7]
	33-48	19	33		3.3	[1.4; 8.0]	3.0	[1.1; 7.9]
Job insecurity**	3-4	15	21	0.233	–	–	–	–
	5-11	23	24					
	12-22	1	6					
Total psychological stress factors**	<-1.0	6	15	0.499	–	–	–	–
	-1.0-+1.0	32	23					
	>+1.0	1	17					
Coworker support**	5-10	12	26	0.641	–	–	–	–
	11	8	19					
	12-16	19	20					
Supervisor support**	4-10	9	23	0.946	–	–	–	–
	11	4	20					
	12-32	26	21					
Physical exertion	1	3	14	**0.018**	–	–	–	–
	2	13	17					
	3	16	22					
	4	7	54					
Cold workplace	No	16	14	**0.003**	1.0	–	1.0	–
	Yes	23	37		3.2	[1.5; 6.6]	2.6	[1.2; 6.0]
Toxic exposure in the workplace	No	26	17	**0.014**	1.0	–	1.0	–
	Yes	13	38		3.0	[1.3; 6.6]	3.3	[1.3; 8.6]
Dangerous workplace	No	27	16	**<0.001**	1.0	–	1.0	–
	Yes	12	60		7.6	[2.8; 20.4]	5.8	[1.9; 17.7]

Table 3 - Mean sleep duration (in minutes) according to days of the week and Job Content Questionnaire scales (Weekdays/ Friday to Saturday).

JCQ scales	Score	Weekdays		Friday nights	
		Mean (SD)	p-value*	Mean (SD)	p-value*
Skill discretion**	12-26[a]	440.8 (94.6)	1.000	466.0 (127.3)	**0.038**
	27-32[b]	440.7 (108.8)		502.9 (118.3)	**(b>c; p<0.05)**
	33-46[c]	440.6 (113.2)		454.9 (108.2)	
Created skill**	3-7[a]	427.4 (95.9)	0.671	446.7 (127.3)	**0.019**
	8[b]	440.1 (102.1)		519.4 (102.2)	**(a<b; p<0.05)**
	9-12[c]	445.6 (113.5)		471.7 (116.2)	
Decision authority**	12-24	420.2 (83.7)	0.437	471.6 (147.0)	0.970
	25-28	452.8 (127.4)		477.6 (113.0)	
	29-48	440.2 (102.4)		477.6 (112.3)	
Decision latitude**	32-56	442.1 (104.8)	0.721	497.2 (132.8)	0.378
	57-64	448.7 (102.1)		474.4 (123.0)	
	65-88	433.9 (106.0)		466.8 (104.0)	
Psychological job demands**	18-28[a]	463.1 (113.1)	**0.007**	481.0 (100.6)	0.757
	29-32[b]	449.3 (104.3)	**(a≠c; p=0.05)**	467.2 (136.0)	
	33-48[c]	404.9 (95.6)		481.3 (117.9)	
Job insecurity**	3-4[a]	423.4 (102.4)	**0.015**	450.4 (113.6)	**0.049*** **
	5-11[b]	441.9 (106.0)	**(a≠c; p=0.05)**	492.0 (114.5)	
	12-22[c]	506.8 (115.9)		502.4 (138.1)	
Total psychological	<-1.0	450.9 (107.3)	0.697	468.8 (106.2)	0.843
Stress factors**	-1.0-+1.0	438.6 (107.4)		478.3 (121.8)	
	>+1.0	414.0 (124.4)		496.0 (107.1)	
Coworker support**	5-10	469.6 (111.3)	0.103	498.5 (118.0)	0.089
	11	426.9 (88.2)		444.5 (116.0)	
	12-16	432.8 (111.6)		480.3 (116.6)	
Supervisor support**	4-10	428.0 (122.4)	0.074	491.7 (103.4)	0.545
	11	396.8 (85.8)		488.5 (127.1)	
	12-32	451.6 (104.1)		470.1 (120.7)	
Physical exertion	1	467.0 (109.4)	0.160	491.1 (138.2)	0.163
	2	451.5 (110.2)		495.1 (114.2)	
	3	428.6 (100.3)		453.1 (113.7)	
	4	396.9 (116.2)		470.4 (113.8)	

SD: Standard deviation
*p: one-way ANOVA
**In tertiles
***Unable to detect where the statistically significant difference is

In each JCQ scale, the higher the score the more significant is the factor being evaluated by that scale.*

A scale of professional qualification that consisted of two questions assessed the number of years of formal education, and the school degree required by the students' job. The study adolescents reported eight to 10 years of school attendance. The number of years of education required by the students' job was then subtracted from the number of years of education the student actually had. The higher the difference, the greater the gap between the number of years of education, and the required education to perform the job; a low skill job does not require many years of education.

Sleep duration or weekly working hours means were compared using t-Student test and one-way ANOVA. When the variances were not homogeneous (tested using Levene's test), non-parametric tests were used (Mann-Whitney test and Kruskal-Wallis test). Multiple comparisons were carried out using the Tukey-HSD (honest significant differences) correction.

The chi-square test was used to evaluate the relationship between body pain and JCQ scales (in tertiles) and the same analyses were conducted for work injury.

RESULTS

Of 354 students, 184 (52.0%) reported having a job at the time of the study, 85 (24.0%) were unemployed, and 85 (24.0%) had never worked. These students who were also working, were employed as office boys, domestic cleaners, baby-sitters and general helpers.

There were significant associations between body pain and the psychological job demands and the total psychological stressors scales. The results showed that the higher the score, the higher the prevalence of body pain. Results of multiple logistic analysis of various risk factors for body pain showed significantly high odds for body pain among females (OR=3.1; p<0.01), those who used alcohol (OR=2.6; p<0.01), those who experienced body fatigue (OR=2.9; p<0.01) or multiple fatigue (OR=8.5; p<0.01), and those in jobs with high psychological demands (Table 1). Tables 1 to 5 only display results at p<0.05. After controlling for sex, alcohol use, and fatigue perception, the odds of experiencing body pain among young workers scoring in the highest tertile

*A shorter version of the JCQ (with 17 questions) was recently translated and adapted to Portuguese language and published by Alves et al.[1]

of psychological job demands was three times higher compared to those in the lowest tertile.

There was a significant association between work injuries and both psychological job demands and physical exertion; the higher the scale score, the higher the prevalence of work injuries (OR=3.0; p=0.02) (Table 2). This table also presents the crude and adjusted odds ratios for body pain, workplace exposures and psychological job demands. The results showed that unfavorable working conditions (cold workplace, toxic exposure and dangerous workplace) are associated with work injuries (OR=2.6, 3.3 and 5.8 respectively).

Tables 3 and 4 show mean sleep duration during weekdays. Mean sleep duration during weekdays was lower in the highest tertile of the psychological job demand scale and higher in the highest tertile of the job insecurity scale. Mean sleep duration on Friday nights was reduced in those who had higher skill discretion, those who had lower created skill and those who had low job insecurity. Mean sleep duration on Saturday nights were lower in those who have high physical demands on their job (Table 4). Mean sleep duration on Sunday nights was lower among those who had lower job insecurity and higher among those who had lower coworker support.

The mean daily working hours was higher among those who had lower decision authority, those who had higher job security, and those who had higher physical exertion (Table 5).

DISCUSSION

Students of public schools generally come from lower social classes. Thus, it is important to note that high school students tend to work so they may increase their family income. This is even more common among students attending school in the evening, so they can have their daytime free to work on full-time jobs.

According to Karasek's demand-control model, a job tends to be potentially hazardous if it has high psychological demands and workers have low decision latitude at work. The former factor is a major reason of why adolescent work should be under strict legislation since it has been shown to have a harmful impact on health due to developmentally inappropriate demands on adolescents. In one of the subscales, the decision authority was found to be related to longer working hours for the adolescents in the study. A mean of preventing these negative health outcomes is to make sure adolescents know their rights, and this should be part of the school education: teaching students, parents, and teachers about workers rights and risks so they could avoid hazardous jobs/tasks.

The work environment, to which these students are subject to, can be hazardous to their education and health. Other authors found associations between the

Table 4 - Mean sleep duration (in minutes) according to days of week and Job Content Questionnaire scales (Saturday to Sunday/Sunday to Monday).

JCQ scales	Score	Saturday nights		Sunday nights	
		Mean (SD)	p-value*	Mean (SD)	p-value*
Skill discretion**	12-26	523.5 (114.3)	0.385	519.3 (117.8)	0.319
	27-32	522.5 (139.1)		503.3 (109.8)	
	33-46	550.8 (137.0)		485.3 (116.7)	
Created skill**	3-7	498.3 (117.8)	0.137	499.6 (118.6)	0.929
	8	529.2 (114.7)		505.3 (100.9)	
	9-12	548.3 (143.8)		497.0 (118.2)	
Decision authority**	12-24	511.6 (162.0)	0.629	477.7 (79.0)	0.449
	25-28	540.0 (120.3)		511.8 (116.2)	
	29-48	536.9 (132.5)		499.0 (121.1)	
Decision latitude**	32-56	513.7 (128.5)	0.483	512.3 (108.1)	0.246
	57-64	536.3 (112.8)		511.2 (111.8)	
	65-88	543.6 (150.3)		483.2 (118.7)	
Psychological job demands**	18-28	545.4 (125.3)	0.672	505.5 (113.8)	0.426
	29-32	527.5 (151.4)		508.0 (116.1)	
	33-48	526.8 (125.3)		482.9 (113.2)	
Job insecurity**	3-4[a]	534.3 (156.5)	0.381	485.8 (106.6)	**0.021**
	5-11[b]	526.2 (118.8)		496.8 (110.8)	**(a,b≠c; p<0.05)**
	12-22[c]	575.3 (104.6)		570.3 (143.2)	
Total psychological	<-1.0	555.6 (135.8)	0.331	498.1 (108.8)	0.685
Stress factors**	-1.0-+1.0	529.6 (133.6)		501.2 (116.5)	
	>+1.0	474.0 (113.1)		456.0 (106.9)	
Coworker support**	5-10[a]	553.4 (116.1)	0.520	535.4 (119.9)	**0.006**
	11[b]	525.0 (133.1)		516.9 (108.0)	**(a≠c; p<0.05)**
	12-16[c]	528.5 (142.1)		474.3 (109.1)	
Supervisor support**	4-10	532.7 (107.4)	0.182	487.3 (127.3)	0.102
	11	483.0 (169.7)		458.3 (93.6)	
	12-32	542.4 (134.1)		510.7 (111.7)	
Physical exertion	1	580.0 (164.4)	**0.048****	509.3 (114.6)	0.345
	2	548.9 (103.2)		511.7 (110.1)	
	3	514.4 (145.4)		490.4 (117.2)	
	4	472.3 (149.4)		456.5 (121.0)	

Table 5 - Mean daily working hours and associated variables of Job Content Questionnaire scales.

JCQ scales	Score	Mean (SD)*	p-value***
Skill discretion**	12-26	7.3 (2.1)	0.617A
	27-32	7.4 (2.2)	
	33-46	7.1 (1.7)	
Created skill**	3-7	7.6 (2.5)	0.569A
	8	7.2 (1.8)	
	9-12	7.2 (1.8)	
Decision authority power**	12-24[a]	8.2 (2.0)	**0.034A**
	25-28[b]	7.0 (2.1)	**(a≠b,c; p<0.05)**
	29-48[c]	7.2 (1.9)	
Decision latitude**	32-56	7.8 (2.2)	0.143A
	57-64	7.2 (1.9)	
	65-88	7.1 (1.9)	
Psychological job demands**	18-28	7.0 (2.4)	0.148K
	29-32	7.4 (1.7)	
	33-48	7.6 (1.6)	
Job insecurity**	3-4[a]	7.5 (2.0)	**0.020**A
	5-11[b]	7.4 (1.9)	**(a,b≠c; p<0.05)**
	12-22[c]	6.0 (2.2)	
Total psychological stress factors**	<-1.0	7.1 (2.3)	0.648A
	-1.0-+1.0	7.4 (1.9)	
	>+1.0	7.0 (2.7)	
Coworker support**	5-10	7.1 (1.9)	0.326A
	11	7.7 (1.8)	
	12-16	7.3 (2.0)	
Supervisor support**	4-10	7..4 (1.8)	0.220A
	11	8.0 (1.7)	
	12-32	7.2 (2.1)	
Physical exertion	1[a]	6.4 (1.9)	0.009K
	2[b]	7.0 (2.2)	(a≠c; p<o.050)
	3[c]	7.8 (1.6)	
	4[d]	7.8 (2.0)	

Per day according to JCQ scales
A: ANOVA; K: Kruskal-Wallis test
*SD: Standard deviation
**In tertiles

JCQ scales and health symptoms such as burnout[18] and depression.[16] The results of these research studies did corroborate the demand-control theory since they associated these symptoms to high-strain jobs.

The results of the JCQ scales were related to several symptoms. The psychological job demands scale showed the greatest association of related health symptoms: adolescents having higher psychological job demands were more likely to report body pain, to get injured at work place, and to sleep less from Mondays to Thursdays. These results in adolescents support previous findings in adults linking psychological job demands and physical symptoms.[9] Nonetheless, it should be mentioned that sleep duration can also be influenced by social factors, mainly during weekends (Friday to Saturday).[19]

The findings of the total psychological stressors scale may be partially explained by the results of the job insecurity scale, i.e., most students felt secure at their jobs and did not believe they might lose it. However, there was still a substantial proportion of students who scored high on this scale, showing that they either had a high psychological demands on the workplace or they believed they were at risk of losing their jobs.

Another important finding is that students who had lower decision authority tended to work one extra hour a day on average than students with higher decision authority. This means that lack of job control by adolescents can lead to serious consequences. Further investigation is needed to determine whether this tendency is actually due to employers taking advantage of adolescents receiving lower wages. However, if it is confirmed, this is a serious issue to be addressed. These results show that not only job physical aspects must be measured to determine possible hazards to adolescents' physical health but their psychological aspects should be measured as well. The four main types of job mentioned in this study (baby-sitters, domestic cleaners, general helpers, and office-boys) did not show any significant differences regarding their overall physical and psychological job demands.

Previous studies in rural areas showed that working adolescents were subjected to physical hazards due to inadequate protection and overly dangerous jobs.[6] The present study showed that work-related psychological factors according to the demand-control model should also be taken into account. They are predictors of reduced sleep duration, work injuries and body pains. These factors are of increased importance to adolescents since they may reduce their performance at school, as shown in the *Departamento Intersindical de Estatística e Estudos Socioe-*

conômicos (DIEESE - Inter-union Department of Statistics and Socio-economic Studies) data on child work and education.[4]

Another important factor is the correlation of perceived job insecurity with increased sleep and reduced work duration. This illustrates the two choices these students have: they either focus on their jobs or aim for better school achievement. The data suggested the longer they work, the more they feel secure at their jobs and the less they sleep. Since approximately 51% students already work eight or more hours a day, this can lead to disengaging from school to focus on work. Joblessness is a feared status in modern society with job insecurity having negative effects on these adolescents' health.[8,17]

It is essential that adolescents know their jobs are associated to their development and well-being so they may choose safer workplaces. In addition, and potentially more effective, there should be enhanced legislation related to work hours and hazardous employment coupled with enforcement of current laws to protect these young workers. Finally, this study showed the need of evaluating the psychological characteristics of adolescents' jobs as a tool to assess whether their jobs are inadequate or not. The study findings show that adolescents may be harmed by jobs at which they have little or no control.

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