

Health Conditions and Factors Related to the Work Ability of Teachers

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Received May 9, 2013 and accepted January 6, 2014

Published online in J-STAGE January 15, 2014

Abstract: This is a cross-sectional study conducted with 258 teachers from nine state schools in two municipalities of São Paulo state with the purpose of assessing their work ability. A questionnaire with socio-demographic and health/work conditions data and the Work Ability Index (WAI) was performed. Most teachers were females, 41.9 yr old on average (SD 9.4), and with an undergraduate degree (95.7%). The work ability was considered good for 42.6% and moderate/low for 35.3%. In linear regressions models, which used the two domain model, the significant variables for a decrease in WAI were: individual perception of a worsening in the health situation ($p<0.0001$), having children ($p=0.0003$ / $p=0.0001$), difficulty in sleeping well at night ($p=0.0009$ / $p=0.0014$), history of physical pain in the previous six months ($p<0.0001$ / $p<0.0001$), being a teacher with a contract ($p=0.0007$) and working as a teacher for a longer time. ($p=0.0183$). Public investments on the work conditions of teachers are important to recover and to maintain their work ability.

Key words : Work ability, WAI, Work conditions, Social conditions, Health situation

Introduction

The work of teachers has a fundamental social value because education can ensure economic growth, and technical and scientific development in any society. In Brazil, there are over 2.6 million teachers working in basic and higher education, and they are responsible for instructing millions of Brazilian students¹. Teachers are the main responsible for fostering the sense of citizenship in students. They believe that the students will be citizens in the future and will be active in the society with rights and duties².

The physical and mental health of any worker may become one of the determinant factors of the work ability³. It is understood that there is a relationship between work ability and the health of workers associated with several

factors, such as socio-demographic factors, lifestyle, workload and biological aging itself within the work structure^{3, 4}. The functional capacity of teachers may be related to psychosocial problems, stress and musculoskeletal damages⁵.

A study⁶ has found that the presence of many diseases and cardiovascular risk factors could decrease the capacity for work of teachers and office workers. When comparing these professions, teachers had a 1.6 higher risk of work ability impairment compared to office workers. Teachers were more exposed to a heavy workload, which probably affected the retirement due to illness. Brazilian studies have indicated a relationship between the work of the teachers and health problems^{5, 7}, emphasizing mental health and psychosocial problems^{10–12}, in addition to voice fatigue^{13–15}.

Studies on work ability were developed by Finnish researchers of the Finnish Institute of Occupational Health – Helsinki – Finland, since the beginning of the 1980's and

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their purpose was to prevent the inability to work across aging workers, i.e., in a productive age^{3, 4}). The Work Ability Index – WAI – was determined based on the individual answers from the workers to a number of questions that took into account their physical and mental work requirements¹⁶). The WAI questionnaire has been translated and is available in 26 languages. Being of great importance for research in these countries, however, its use should not be trivialized as a measure of selection or exclusion of employees, as this practice compromises ethical aspects.

The WAI has a score variation ranging from 7 to 49 points, showing the perception the workers themselves have on their work ability, divided into the following categories: low (7–27 points), moderate (28–36), good (37–43), and excellent work ability (44–49)¹⁷). Because this is a widely used questionnaire in occupational health researches covering work requirements, health conditions and mental and physical resources, some researchers¹⁸) concerned about the scope of the WAI questionnaire suggested structures with more than one dimension to interpret the “subjectively estimated work ability” and “objective health status”¹⁹).

In a German study that aimed to identify the dimensionality of the WAI, the authors analyzed a sample of 321 individuals from different professional groups that included school teachers, office workers, nursery teachers and managers. The authors concluded that the use of the total score of the WAI only did not suit statistical analyzes that evaluated the ability of individuals to work and subsequently developed a two-dimensional structure analysis of the WAI instrument, which can be applied in similar studies¹⁹).

A research conducted in Finland with 1,012 teachers²⁰) evaluated the ability to work in the total score of the instrument and concluded that the decrease of the work ability was related to high mental demand experienced in schools, which was generated by time pressure and by dealing with students, triggering stress symptoms and psychosomatic diseases. In a systematic review²¹) on the effects of individual and work factors related to the work ability, the authors have concluded that the factors associated with this decrease were: lack of pleasure, lack of physical activity, presence of musculoskeletal pain, age, obesity, high demand of mental work, lack of autonomy, inadequate physical workplace and high physical workload .

The relevance of a study with teachers from the Brazilian public system is in the value of the teacher to the society. Preserving the health of teachers is to ensure

social sustainability and, moreover, it can contribute to teachers, in general, to realize that some individual factors could ensure them good health even when they are retired. The objective of this study was to explore the relationship between health conditions and the work ability of teachers in state schools in two cities in the state of São Paulo and identify the main factors associated with individual characteristics and health.

Subjects and Methods

The cross-sectional epidemiological study²²) was conducted in two towns in the countryside of the state of São Paulo: São José do Rio Pardo and Campinas, in nine state schools of elementary and/or high school education, intentionally chosen, with an equal participation of teachers in schools from more centralized and also peripheral regions. The mix of sample proportions by quotas according to the different regions of each school chosen in each one of the cities assured characteristics that could reinforce the representativeness of the findings in relation to the reference population, that is, the teachers from public schools of the state of São Paulo.

After contacting the board of directors of each school and obtaining their permission to apply the questionnaires to the teachers, we chose to apply them during the Collective Pedagogic Working Hour (CPWH) weekly meetings due to the difficulty in finding the largest number of teachers during regular class recess times. In addition to CPWH, the researcher remained for a period of time in each school to advertise and request the participation of teachers who did not attend the CPWH meetings. The research was conducted from August to December 2005, and the sample was comprised by 258 teachers, in a population of 468, with a response rate of 55.1%.

Public elementary and high school teachers were included in the research, from both genders, who accepted to participate in the research signing a consent term. No differences were observed in relation to gender and age among the teacher who participated and who did not participate in the research. Regarding ethical aspects the research was approved by the Research Ethics Board (REB) of the Faculty of Medical Sciences of the University of Campinas – FCM/UNICAMP.

The Work Ability Index (WAI)¹⁶) is a self-applicable instrument, and a questionnaire²³) was used with socio-demographic data, lifestyle, work, health aspects and occupational risks for data collection. The WAI questionnaire consists of seven subscales related to different aspects of

Table 1. Work Ability Index (WAI) related to some characteristics of the teachers (n=258)

Variable / Category	WAI										p*
	Excellent		Good		Moderate		Poor		Total		
	n	%	n	%	n	%	n	%	n	%	
Sex											0.1760
Male	16	6.2	18	6.9	10	3.9	3	1.2	47	18.2	
Female	41	15.9	92	35.6	58	22.5	20	7.8	211	81.8	
Age (yr)											0.0001
<30	7	2.7	8	3.1	5	2	11	4.3	31	12.1	
30–40	20	7.7	35	13.6	20	7.7	4	1.6	79	30.6	
40–50	20	7.7	41	15.9	29	11.3	3	1.2	93	36.1	
≥50	10	3.8	26	10.1	14	5.4	5	2	55	21.3	
Marital Status											0.1702
Married	38	14.7	71	27.5	39	15.1	9	3.5	157	60.8	
Divorced/Widow	5	1.9	16	6.2	10	3.9	3	1.2	34	13.2	
Single	14	5.4	23	8.9	19	7.4	11	4.3	67	26	
Number of years as a teacher											0.013
<10	26	10.1	24	9.3	21	8.1	2	0.8	73	28.3	
10–15	13	5	33	12.8	14	5.6	1	0.4	61	23.6	
15–20	11	4.3	30	11.6	17	6.6	2	0.8	60	23.3	
≥20	10	3.9	24	9.3	23	8.9	7	2.7	64	24.8	
Compared health											<0.0001
Better/Much better	41	15.9	57	22.1	26	10.1	2	0.8	126	48.9	
Average	16	6.2	47	18.2	31	12	11	4.3	105	40.7	
Poor/Little poor	0	0	6	2.3	11	4.3	10	3.9	27	10.5	
Total	57	22.1	110	42.6	68	26.4	23	8.9	258	100	

*p-value by χ^2 test

Table 2. Current work ability (WAI item 1) and teachers self-referred health (n=258)

Variable		n	Mean	SD	p-value*
Current work ability	**poor/little poor	27	7.15	1.49	0.0004
	**average	105	7.78	1.45	
	**better/much better	126	8.25	1.26	

*p-value: Kruskal-Wallis test, **The category – poor/little poor, average and better/much better are from the Occupational Stress Questionnaire – OSQ²⁴⁾

work ability: WAI item 1 refers to current work ability compared to the best period of life of the worker; WAI item 2 is about the work ability concerning to physical and mental demands at work; WAI item 3 – diseases with physician diagnosis; WAI item 4 refers to “estimated work impairment due to diseases”; WAI item 5 – “sick leave during the past year (12 months)”; WAI item 6 – “own prognosis of work ability two years from now” and WAI item 7 – “mental resources”¹⁹⁾.

The questionnaire with socio-demographic data – QSETES²³⁾ has 32 structured questions and five semi-structured. Closed questions are answered with just one word or number and/or options of yes or no: origin, sex,

age, marital status, children, educational level, work (function, bond, shift, overtime, accident, breaks, individual protection etc.), sleep, house chores, housing, self-referred anthropometric measurements, health compared to other people of the same age, physical pain in the past six months and in the last week, lifestyle (smoking, alcohol intake, physical activity, leisure and medicines), health problems in the last 15 days and risks/hazards at work (position, sound, voice, stress, computer, movements etc.).

The semi-open questions are those that describe what the worker does in his/her work, main previous jobs, the level of tiredness at work, what they like in their work and what their plans for the future are²³⁾. One question about

Table 3. Linear regression with Factor 1 as dependent variable (n=258)

Factor 1	Coefficient	SE	Confidence Interval		p-value	R ²
			Lower limit	Upper limit		
Intercept	32.0993	1.3329	29.4740	34.7246	<0.0001	30.91
Professional category					0.0021	
Effective*	-3.5445	1.0304	-5.5740	-1.5150	0.0007	
ACT/OFA**	-2.6603	1.0006	-4.6311	-0.6895	0.0084	
Eventual*** (ref)						
Children					0.0003	
No	-1.9131	0.5183	-2.9339	-0.8922	0.0003	
Yes (ref)						
Health compared					<0.0001	
†Poor/little poor (ref)						
†Average	2.5705	0.7788	1.0366	4.1044	<0.0001	
†Better/much better	3.6401	0.7953	2.0738	5.2064	0.0011	
Pain – last six months					<0.0001	
No	2.0361	0.4965	1.0582	3.0140	<0.0001	
Yes (ref)						
Can not sleep					0.0009	
No (ref)						
Yes	1.9058	0.5686	0.7859	3.0258	0.0009	

*Effective teachers were gazzeted by the State. They have job stability. **ACT/OFA teachers were hired temporary job by the State. They do not have approval in public contest. ***Eventual teachers were at the beginning of their career and without approval in public contest. †The category – poor/little poor, average and better/much better are from the Occupational Stress Questionnaire – OSQ²⁴)

health compared to people of the same age from the Occupational Stress Questionnaire²⁴) was answered and the responses were better/much better, average and poor/little poor.

In this research with Brazilian teachers performed statistical analyzes with the WAI score ranging between seven and 49 points and was also used the “two factor model / two- dimensional structure”¹⁹) with two domains for the WAI: Factor 1 “estimated subjectively work ability” – including WAI items 1, 2, 4, 6 and 7, ranging from 5–37 points and the second domain – Factor 2, “objective health status” including items 3, 4, 5 and 6, ranging from 4–25 points.

Therefore, in order to investigate possible predictive factors for the two domains of the WAI multiple linear regression models were constructed²⁵), in which the scores of the two domains were considered as dependent variables and the other variables as independent. Moreover, they are adjusted for age and gender. For all analyzes, the stepwise variable selection method was used. The results were presented by regression coefficients, standard errors, confidence intervals, and *p*-value. It was also reported the value of the coefficient of determination R² for each of the fitted models.

A plausible justification for using two-factor model is related to the fact that the seven areas of WAI are measuring tools for two different underlying constructs, meaning that the total score alone could not adequately describe the ability to work and so it was divided into two domains¹⁹). For all the statistical analyzes, the significance level adopted for the tests was 5%, that is, *p*<0:05 and the statistical software used was System for Windows (Statistical Analysis System, version 9.2) SAS[®].

Results

Most teachers were females (81.8%), married (60.8%) and had children (85.9%). The average age was 41.4 yr old (SD 9.4) and ranged from 20 to 65 yr old, and 74.4% were up to 49 yr old. The teachers had a higher education degree (95.7%), and among them, 15.1% were graduate (Master’s, PhD’s or Specialization Degree). Below, the categorical distribution of the Work Ability Index (WAI) is presented, according to the described variables on gender, age, marital status, time working as a teacher, and individual health perception when compared to other people of the same age (Table 1).

The age, number of years as a teacher and individual

Table 4. Linear regression with Factor 2 as dependent variable (n=258)

Factor 2	Coefficient	SE	Confidence Interval		p-value	R ²
			Lower limit	Upper limit		
Intercept	20.3569	1.3001	17.7963	22.9174	<0.0001	36.82
Children					0.0001	
No	-1.8752	0.4805	-2.8215	-0.9289	0.0001	
Yes (ref)						
Number of years as a teacher	-0.0900	0.0381	-0.1649	-0.0150	0.0189	
Pain – last six months					<0.0001	
No	3.8300	0.4438	2.9560	4.7039	<0.0001	
Yes (ref)						
Can not sleep					0.0014	
No (ref)						
Yes	1.7140	0.5310	0.6681	2.7598	0.0014	

health perception variables stand out, which were significantly associated with a reduced work ability of the teacher. The gender variable was significant in the Mann-Whitney test when WAI was compared ($p=0.0481$), and women presented a lower value than men. The WAI average of the studied teachers was 38.6 points (SD 5.8), 38.2 points (SD 5.8) among women, and 40.3 (SD 5.6) among men. Women from 40 to 50 yr old presented a 38.1 WAI (SD 5.6), and, among men, it represented 41.6 (SD 4.6).

Regarding the individual health perception of teachers when compared to other people of the same age, it was evidenced that 40.7% considered that their health was equal to the health of other persons with the same age; 48.8% said it was better/much better, and 10.5% poor/little poor.

Comparing the WAI total score and the individual health perception of teachers, the result was significant for those who considered they had a worse and slightly worse health situation, with WAI in the moderate range (28 to 36 points); and 37.1% who felt they had a worse and slightly worse health situation had a low WAI (7 to 27 points), both with p -value lower than 0.0001 (χ^2 test).

Another comparative test was conducted to confirm this result using the individual health perception of teachers only WAI item 1 – “current work ability compared with the lifetime best” (Table 2).

In this model the stepwise process for selection of the variables was used and adjusted for age and sex. The analyses considered in Factor 1 with WAI items 1, 2, 4 and 6 are presented (Table 3).

Below are the analyses considered in Factor 2, WAI items 3, 4 and 5 (Table 4).

As to the lifestyle, it was observed that most of them

were involved in leisure activities (93.4%), and only 56.6% practiced at least one physical activity regularly. Regarding smoking habits and drinking alcohol, 27.5% answered affirmatively and 9.3% were smokers, smoking on average, 13.3 (SD 8.4) cigarettes a day.

The main diseases that were self-reported by teachers (71.3%) were: lumbar region disorder (37.6%), followed by accidental injury on the hand, arm, leg and foot (21.7%) and mild emotional disorder (19%); and those with medical diagnosis (82.2%) were: “musculoskeletal disease: upper and lower back and sciatica” (28.7%); “injury from accident” (19.8%) and “slight mental disorder/problem” (17.8%) (Fig. 1).

Discussion

The prevalence of females teaching in elementary and high school education is similar to what was reported by other authors in researches carried out with teachers⁷⁻¹². The WAI average for women was two points lower in comparison to men. This fact may be related to several factors, among which are the double working shift between school and household chores, as 92.9% of the interviewed women also had domestic chores (χ^2 test, $p < 0001$). In addition to household chores, 66.3% of teachers had children and child care presents itself as a task performed by teachers, especially women.

The double shift for women is a complex issue. It can be responsible for several factors that decrease women’s health, such as greater psychological and physical work overload, insufficient time for leisure, rest and sleep hours⁷. Other studies^{26, 27} have also associated the demands of work and household chores to poor physical and

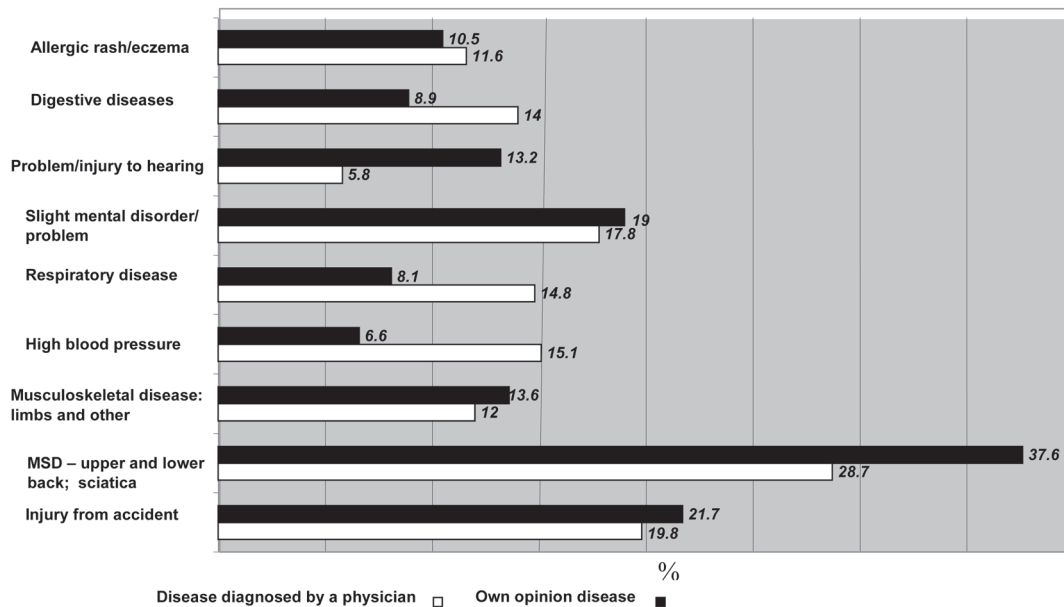


Fig. 1. Prevalence of the diseases according to the opinion of the teachers and the medically diagnosed diseases.

mental health because the subjects of this research entailed little life satisfaction, high levels of stress, less time for physical activity and greater likelihood of drinking alcohol.

Oftentimes, when the work overload is beyond the capacity of the worker, it may be reflected as fatigue manifestations, work absences, incidence of musculoskeletal disorders and mental disorders²⁸⁾, considering that these two last findings are similar to this study (Fig. 1).

Another important aspect was the decrease of WAI values for older age groups and those with higher experience time working as teachers. European studies have shown that most workers while occupying any job have their work ability reduced according to the functional aging of the organism^{3, 4)}.

This was confirmed in this study because teachers who had a contract were the ones with longer careers because they were hired with a permanent contract and would only leave the profession through retirement. This was highlighted in the analysis model as dependent on Factor 1 – “subjectively estimated work ability” (Table 3) and in the Factor model 2 – “objective health status” (Table 4), however, in this analysis it was not the professional category that was associated with lower scores of ability, but the length of employment, which implied that the longer in the profession, the older this teacher was.

In this study the presence of physical pain stood out among teachers, since the variable physical pain in the past six months both in linear regression analysis with

dependent variable Factor 1, as in the analysis with the dependent variable Factor 2 showed reduced work ability. Physical pain can be a constant in the life of the education professional, especially musculoskeletal pain⁸⁾, mainly due to excessive workload by physical exertion performed daily in schools. Besides teachers, other workers²⁹⁾ also have musculoskeletal symptoms associated to reduced work ability.

As to the self-referred health, significant results for those who considered their health worse and a little worse, the WAI tended to lower scores when analyzing the total score and also when we used only the subscale of the WAI item 1 – current work ability – the *p*-value was significant. Using this type of analysis has been common in work ability researches³⁰⁾, because the validity and similarity in results between WAI score and one question value, as the question 1, confirm the veracity of the analysis.

There were differences between the diseases with physician diagnosis (28.7%) and the diseases the teachers had in their own opinion (37.6%). This discrepancy may be a negative factor for the absence of teachers in the studied public schools, since 38.4% of the teachers were absent from work from one to nine days due to some health problem, medical appointment or to undergo clinical examinations in previous twelve months. It was observed that these absences could be related to the total workload in schools, because 97.7% of the teachers had an average of 35.1 h (SD 12.2) during the week, in addition to the hours spent working at home, for extra-class work for most of these

teachers.

There are limitations in this study. Since this was a cross-sectional research, cause and effect relationships cannot be established; the analyzed data occurred only during a period of time; the results may be representative only for the teachers who worked in the nine state schools that participated in this research, whereas both the teachers who were absent from work, due to diseases, and those who had different roles at the schools did not participate in this research.

In conclusion, in this study, the teachers were mostly women, married, with children and working as teachers for over 15 yr. Most of them had a good or excellent WAI; however, a portion of young women, under 30 yr old, were in the moderate or poor category.

Some health conditions were associated with reduced work ability among teachers, and stood out: being a teacher with permanent contract with more time (in years) of profession; having children, the presence of physical pain in the past six months, self-referred health compared with people of the same age as being poor/little poor and not sleeping well at night. Such health conditions and also individual factors could have a direct association with the high percentage of diseases diagnosed by a physician and “own opinion diseases” related by teachers.

Public investment is crucial to encourage health programs for public school in order to promote more health to teachers, as they are professionals with high social value in the upbringing of future citizens of any nation.

Acknowledgement

Grant from “Coordenação de Aperfeiçoamento de Pessoal de Nível Superior” – CAPES – master’s scholarship.

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