

INFLUENCE OF INDIVIDUAL, LIFESTYLE AND WORK-RELATED FACTORS ON THE WORK ABILITY AMONG OFFICE WORKERS

By

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Abstract:

Background: Work ability is defined as the ability of the worker to perform his job, taking into consideration the work demands, the worker's health status and his mental resources. Many factors may influence the work ability. **Aim of work :** to determine the influence of individual, socio-demographic and work-related characteristics on the work ability of office workers and to determine the relative contribution of different factors to the level of work ability. **Materials and Methods:** A cross sectional study was conducted at the administrative departments of Ain Shams University. A total of 892 office workers completed a predesigned self-administered questionnaire including data about socio-demographic, lifestyle and work-related characteristics in addition to Work Ability Index. Measurements of height and weight were also performed. **Results:** Using multiple linear regression analysis; age, Body Mass Index and performing dual work were found to be negatively influencing the work ability of male workers, while practicing physical exercise and eating balanced diet were positively influencing it ($R^2 = 0.34$). Marital status, number of children and Body Mass Index were found to be negatively influencing the work ability of female workers, while practicing physical exercise, adequate sleep and eating balanced diet were positively influencing it ($R^2 = 0.26$). **Conclusion:** Some individual, lifestyle and work-related factors have a significant influence on the work ability among office workers.

Keywords: Work ability, Work Ability Index, work-related factors, Obesity, Lifestyle, Office workers

Introduction

Work ability is defined as the ability of the worker to perform his job, taking into consideration the work demands, the worker's health status and his mental resources (Ilmarinen and Rantanen, 1999). This concept was developed in order to prevent workers from quitting the workforce due to work-related disability. It is a valuable tool to adapt interventions at the individual level (Alavinia et al., 2007).

On the basis of this concept, researchers of the Finnish Institute of Occupational Health developed the Work Ability Index (WAI); an instrument used in occupational health research as well as clinical occupational health settings to assess work ability in workplace surveys and during clinical examinations (Tuomi et al., 1998). It was first developed as a research method in a follow-up study of ageing employees (Tuomi et al., 1991). Nowadays, it is also used by occupational health professionals as a practical tool to measure subjective work ability (Kujala et al., 2006). The index has an acceptable internal validity (Eskelinen et al., 1991; Nygård et al., 1991) and satisfactory test-retest reliability (de Zwart et al., 2002).

Previous researches studying work ability, especially among physically demanding jobs, showed that the factors negatively influencing the workers ability, as measured by WAI, are older age, high physical work demands, low control over the work, unhealthy lifestyle as lack of physical activity, and poor physical fitness (Pohjonen, 2001; Tuomi et al., 2001; Alavinia et al., 2007).

However, few researches have studied a wide range of relevant work ability risk factors especially in mentally demanding occupations as office workers (van den Berg et al. 2008). In addition, most of them have not determined the relative contribution of different factors to the level of work ability (Alavinia et al., 2007).

Sjögren-Rönkä et al. (2002) studied the psychological risk factors of work ability among office workers; his results showed that low work stress and high self-confidence were associated with high work ability. In addition, Martinez and Latorre (2006), in their study, related job seniority and job satisfaction to better work ability among office workers.

In addition to work-related risk factors, recent researches showed that lifestyle characteristics such as leisure-time and physical activity can also affect work ability (Kaleta et al., 2004; van den Berg et al., 2009).

This multifactorial nature of work ability should be taken into consideration when designing health promotion programs for improvement of the performance at work. (van den Berg et al., 2009).

Aim of the Work

The aim of this study is to determine the influence of some individual, lifestyle and work-related factors on the work ability of office workers.

Material and Methods

Study design and setting:

A cross sectional study was conducted at the administrative departments of Ain Shams University from December 2011 till February 2012.

Study population and Sample:

The study population consisted of office workers in different administrative departments. A convenient sample of 892 participants was selected using 23.3% as an assumed prevalence of

moderate and poor work ability (Costa et al., 2005) with 95% confidence and 80% power (CDC, 2002).

Study methods:

All participants were subjected to the following:

1. A predesigned self-administered questionnaire including data about socio-demographic data, occupational history as well as lifestyle factors.
2. WAI which consists of seven dimensions (Table 1):
 - Current work ability compared with the lifetime best
 - Work ability in relation to the demands of the job
 - Number of current diseases diagnosed by a physician
 - Estimated work impairment due to disease
 - Sick leave during the past year (12 months)
 - Own prognosis of work ability two years from now
 - Mental resources (worker's life in general, both at work and during leisure time) (Ilmarinen, 2009)

Table 1: The seven dimensions covered by the work ability index, their range of scores and their explanations.

Item	Range of scores	Explanation
Current work ability compared with lifetime best	0–10	0 = very poor, 10 = very good
Work ability in relation to the demands of the job	2–10	2 = very poor, 10 = very good
Number of current diseases diagnosed by a physician	1–7	1 = 5 or more diseases, 2 = 4 diseases, 3 = 3 diseases, 4 = 2 diseases, 5 = 1 disease, 7 = no diseases
Estimated work impairment due to diseases	1–6	1 = full impairment, 6 = no impairment
Sick leave during the past 12 months	1–5	1 = ≥ 100 days, 2 = 25–99 days, 3 = 10–24 days, 4 = 1–9 days, 5 = 0 days
Personal prognosis of work ability 2 years from now	1, 4 or 7	1 = hardly able to work, 4 = not sure, 7 = fairly sure
Mental resources	1–4	1 = very poor, 4 = very good
Total score	7–49	7–27 = poor, 28–36 = moderate, 37–43 = good, 44–49 = excellent

3. Measurements of height (in m) and weight (in kg) by the standard methods.

Ethical considerations:

Administrative approval from the workers' affairs of Ain Shams Faculty of Medicine was obtained. Confidentiality of obtained data was ensured.

Data management:

- Data entry and analysis were performed using SPSS program version 20.
- WAI was derived as the sum score of the ratings on each dimension. The range of the summative index is 7–49, which is classified into poor (7–27), moderate (28–36),

good (37–43), and excellent (44–49) work ability (Ilmarinen, 2007).

- Body Mass Index (BMI) was calculated by dividing the body weight in kilograms by the square of body height in meters ($BMI = \text{kg/m}^2$). According to WHO (2004), workers were divided into:

- Underweight: $BMI < 18.5 \text{ kg/m}^2$
- Normal body mass: BMI from 18.5 to $< 25 \text{ kg/m}^2$
- Overweight: BMI 25 to $< 30 \text{ kg/m}^2$
- Obese: $BMI \geq 30 \text{ kg/m}^2$

The data collected were analyzed by descriptive as well as inferential analysis.

Multiple linear regression models were used to explore the relative

contribution of different factors to the level of work ability.

The significance level was set at $P < 0.05$.

Results

The characteristics of the study population in the administrative departments of Ain Shams University are described in table 2. The mean age of the workers was 42.8, nearly two thirds were females (67.2%), and most of the workers were married (79.7%). Regarding lifestyle factors, almost 80% of the workers were either overweight or obese. Smoking, eating a balanced diet, practicing physical exercise, and sleeping adequately represented 34.7%, 44.6%, 20.6%, and 38% of the study population, respectively. For their current jobs, the mean total working years was 19.2. Almost half of the workers have rest breaks during work (55%), but only 19.2% have two jobs.

Table 2: Individual, lifestyle and work-related characteristics of the participating office workers in Ain Shams University

	N	%	Mean ± SD
<i>Individual Characteristics:</i>			
-Age	863	-	42.84±10.26
-Gender			
male	292	32.8	-
female	599	67.2	-
-Marital Status			
single	102	11.4	-
married	710	79.7	-
divorced	33	3.7	-
widow	46	5.2	-
-BMI	892		
Underweight	6	0.7	29.72±6.67
Normal	176	19.7	
Overweight	345	38.7	
Obese	365	40.9	
<i>Lifestyle factors:</i>			
-Smoking	306	34.7	-
-Balanced Diet	398	44.6	-
-Physical Exercise	182	20.6	-
-Adequate Sleep	338	38.0	-
<i>Work-related factors:</i>			
-Total working Years	871	-	19.16±9.88
-Rest Breaks	491	55.0	-
-Dual work	168	19.2	-

According to the work ability index, more than half of the participating workers had moderate work ability (54%), and 8% of them had poor work ability (figure 1).

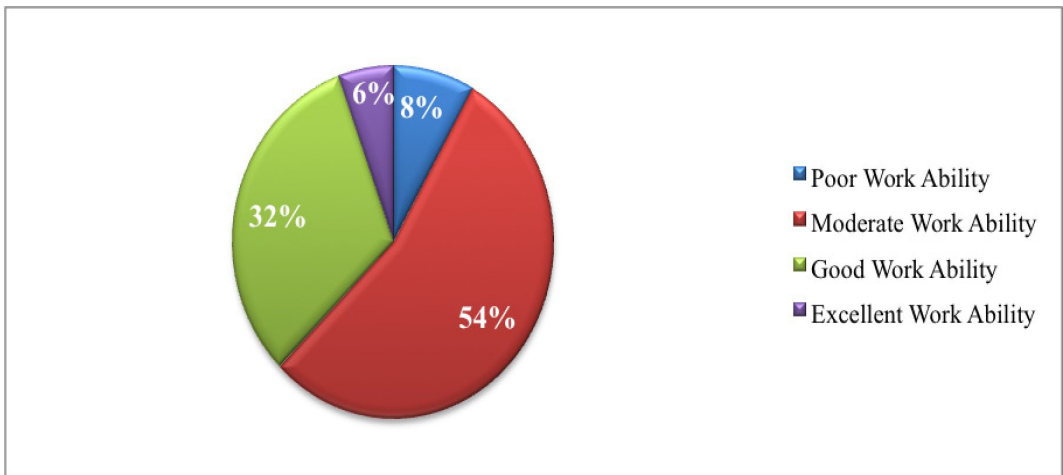


Figure 1: Work ability index of the participating workers (N=892).

The mean WAI total score was 34.83 ± 5.42 where male workers had significantly higher score than female workers (36.60 ± 5.38 and 33.97 ± 5.23 respectively) (table 3).

Items of the work ability index of the participating workers are described in table 3. Results shows that there

were statistically significant differences between male and female workers regarding work ability in relation to the demands of the job, number of current diseases, estimated work impairment due to diseases, sick leave during the past 12 months, and mental resources.

Table 3: Items of the Work ability index of the participating workers (N=892).

Item	Scale	Male	Female	Total	p-value
		Mean \pm SD	Mean \pm SD	Mean \pm SD	
Current work ability compared with lifetime best	0–10	8.10 \pm 1.48	8.14 \pm 1.46	8.12 \pm 1.46	0.738
Work ability in relation to the demands of the job	2–10	8.88 \pm 1.18	8.58 \pm 1.32	8.68 \pm 1.28	0.002*
Number of current diseases diagnosed by a physician	1–7	3.37 \pm 2.29	2.10 \pm 1.69	2.51 \pm 1.99	0.001*
Estimated work impairment due to diseases	1–6	4.56 \pm 1.48	4.12 \pm 1.50	4.26 \pm 1.50	0.001*
Sick leave during the past 12 months	1–5	4.11 \pm .91	3.91 \pm .90	3.98 \pm 0.91	0.001*
Personal prognosis of work ability 2 years from now	1, 4 or 7	5.29 \pm 2.05	5.11 \pm 2.02	5.17 \pm 2.03	0.142
Mental resources	1–4	2.29 \pm 1.15	2.01 \pm 1.06	2.10 \pm 1.10	0.001*
Total score	7–49	36.60 \pm 5.38	33.97 \pm 5.23	34.83 \pm 5.42	0.001*

*The difference is significant at 0.01

Table 4 shows the influence of individual characteristics, lifestyle factors, and work-related factors on the work ability index among both male and female office workers, according to multiple linear regression model. For males: old age, obesity (high BMI), and performing dual work negatively influence the work ability while practicing physical exercise and eating balanced diet were positively influencing it. This model explains 34% of the variability in the work ability

measured by the WAI ($R^2=0.34$). For females; being married, increasing number of children and obesity (high BMI) negatively influence the work ability, while practicing physical exercise, sleeping adequately and eating balanced diet were positively influencing it. Work related factors were not significantly influencing the work ability index for females. This model explains 26% of the variability in the work ability measured by the WAI ($R^2=0.26$).

Table 4: Multiple linear regression analysis of the factors affecting Work Ability Index among male and female office workers.

Models	Beta	SE	95% CI	
			Lower Bound	Upper Bound
Model for male workers*				
(Constant)	49.41	1.94	45.59	53.23
Individual Characteristics:				
Age	-0.13	0.03	-0.19	-0.07
BMI	-0.27	0.05	-0.37	-0.18
Lifestyle factors:				
Exercise	2.87	0.67	1.56	4.17
Balanced diet	1.11	0.59	-0.06	2.27
Work-related factors:				
Dual work	-2.14	0.60	-3.33	-0.96
Model for female workers **				
(Constant)	40.65	1.10	38.48	42.82
Individual Characteristics: Marital status	-0.55	0.32	-1.18	0.08
Number of children	-0.33	0.16	-0.65	-0.003
BMI	-0.20	0.03	-0.26	-0.14
Lifestyle factors:				
Exercise	1.15	0.54	0.10	2.20
Sleep	1.10	0.42	0.27	1.92
Balanced diet	1.65	0.42	0.82	2.48

* $R^2 = 0.34$ ** $R^2 = 0.26$

Discussion

The average perceived work ability of office workers under study was 34.8 (SD=5.4) which is classified as moderate work ability. In this case, measures are needed to improve the work ability of those workers (Ilmarinen, 2009). In addition 8% of them had poor work ability. These results are relatively lower than the Finnish reference data in mentally demanding work (mean 39) (Tuomi et al., 1998). It is also lower than the results of van den Berg et al. (2008), who found that the proportion of workers with poor work ability among white-collar workers in commercial services industry was 2.1% and the mean WAI was 41.1 (SD = 5.1).

It was noticed that average WAI score of male workers was significantly higher than female workers which is consistent with the results of Kujala et al. (2005) who found that the mean WAI was 41.1 (SD 4.2) for men and 40.1 (SD 4.2) for women. In addition, Costa et al. (2005), in their study, stated that women showed significantly lower mean WAI than men in all age groups.

Monteiro et al. (2006), who studied work ability of workers in different age

groups in a public health institution in Brazil, observed a larger decrease in the mean value of WAI with age among women than among men.

The current study showed that the work ability index of office workers was predominantly influenced by individual, lifestyle and work-related factors. Factors related to the physical work environment were not studied, as the work done across the studied group was very similar, consisting of physically light, mostly mental work.

Regarding individual factors, it was found that WAI scores were significantly lower in older male workers than younger ones which suggest that occupational health programs aimed at maintaining and promoting the work ability of workers should focus on older age group.

This finding is consistent with the results of Monteiro et al. (2006) who reported that younger age group had higher scores on the work ability index than older age groups. In addition, Pohjonen (2001) reported a significant decrease in work ability in workers above 40 years. On the other hand, Martinez and Latorre (2006) found no

association between work ability and age.

In both male and female workers, there was a statistically significant association between WAI and BMI, where WAI scores significantly decrease with higher BMI.

Fischer et al. (2006), in their study, identified different factors associated with inadequate work ability among male and female nursing personnel at a public hospital. They found that significantly associated factors include age, high BMI and obesity.

Among female workers, single workers had higher WAI. It was also clear that as the number of children increased the WAI decreased and vice versa. These results reflect that the burden of household duties, child bearing and rearing, that married female workers carry in addition to their work, may affect their work ability. This is consistent with Fischer et al. (2006) who proved that lower WAI is associated with raising underage children.

Regarding lifestyle factors, practicing physical exercise was found to be associated with high WAI in both

male and female workers. This finding was similar to that of Tuomi et al. (1997) and van den Berg et al. (2008) who reported that a lack of vigorous physical activity was associated with decreased work ability. Even moderate regular physical exercise affects positively perceived work ability (Nurminen et al., 2002). There was no significant association between smoking and WAI, a result that was also reported by Tuomi et al. (2001), Kaleta et al. (2006) and van den Berg et al. (2008). The current study also showed that eating a balanced diet has a positive effect on work ability for both males and females. One study reported that a diet with low fiber intake had an odds ratio of 27.6 for a poor WAI (Kaleta et al., 2006). It is well known that improving lifestyle factors especially physical exercise would lower the risk of some diseases as cardiovascular diseases, type 2 diabetes mellitus and musculoskeletal disorders (Eyer et al., 2003). This in turn will affect positively the work ability especially for older workers (Ilmarinen and Rantanen, 1999).

Regarding work-related factors, male workers having dual work had

significantly lower work ability. This could be explained by the fact that adding further load on the worker, due to performing this additional job, would consequently increase the working hours per day and the mental and physical demands required from him.

In conclusion, some individual, lifestyle and work-related factors have a significant influence on the work ability among office workers.

Limitations of the study

The cross-sectional design of this study did not allow confirming the causal relationship between work ability and the factors under study. In addition, limited work-related factors studied affect the predictability of the model.

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