

# FACTORS RELATED TO WORK ABILITY AMONG THAI WORKERS

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**Abstract.** This study aimed to examine the factors related to work ability among small and medium enterprise (SME) workers in Thailand. The subjects consisted of 845 males and 1,163 females. They were interviewed regarding personal information, working conditions, health status, job stress and work ability. Their blood pressure, body weight and height were also measured. More than half the subjects reported high job stress. Women had higher job stress than men. The work ability index (WAI) results for managers, supervisors and operators were 42.3, 41.4 and 39.8, respectively. Job control of managers and supervisors was higher than operators. The WAI of females decreased with increasing age for those over age 45 years. Factors related to WAI were mental health, social support at work, depression and age. The results suggest job stress reduction programs should be considered to improve work ability among SME workers.

**Keywords:** work ability, job stress, Thai workers

## INTRODUCTION

Work ability expresses the generic evaluation of the productive capacities of a worker, the worker's health, and his psychological resources. It is an important factor for maintaining a working life. Several studies have already reported that work related risk factors, lifestyle, poor musculoskeletal capacity, and age can affect work ability (Huuhtanen *et al*, 1997; Ilmarinen, 1997; Tuomi *et al*, 1998; Pohjonen, 2001; Alavinia *et al*, 2007; Van den Berg *et al*, 2009).

In Thailand, small and medium sized enterprises (SME) employ the largest part

of the workforce. SME often lack resources and infrastructure to protect worker health (Leka *et al*, 2004) which leads to increased accidents and work related diseases among employees. Understanding factors influencing work ability is crucial for planning interventions to promote work ability. However, only a limited number of studies on work ability among employees have been carried out in Thailand.

The aim of this study was to explore factors related to work ability among Thais using the work ability index (WAI).

## MATERIALS AND METHODS

### Subjects

This cross-sectional study evaluated randomly selected SME from Bangkok and five other provinces of Thailand: Chiang Mai, Nakhon Ratchasima, Rayong, Ayutthaya, and Trang. The subjects were

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recruited by a company staff member. Researchers were not involved in the selection process to reduce selection bias. The study included 2,008 workers, 845 males and 1,163 females ranging in age from 21 to 61 years.

All subjects gave written informed consent. Ethical approval for this study was obtained from the Ethics Review Committee of Mahidol University, Bangkok, Thailand.

### General characteristics

The subjects were individually interviewed regarding their personal and medical histories, WAI, work experience, and lifestyle factors, such as current smoking status, alcohol consumption and physical exercise. Smoking status was categorized into two groups: current smoker and never or quit smoking. Alcohol consumption during the previous year was asked about and the results were classified into two groups: regular alcohol drinking (four times or more per month) and no drinking (less than four times per month). Physical exercise was divided into two groups: exercise (three or more times per week) and lack of exercise (less than three times per week).

### Work ability

Work ability was measured with the WAI. The WAI consists of an assessment of physical and mental demands of an individual in relation to their work, previously diagnosed diseases, limitations in work due to disease, sick leave, work ability prognosis and psychosocial resources. The WAI consists of seven dimensions and an index is derived from the sum of the ratings of these dimensions. The range of the summative index is 7 to 49, which is classified into poor (7-27), moderate (28-36), good (37-43), and excellent (44-49) work ability (Kloimuller *et al*, 2000).

### Psychosocial factors at work

Psychosocial factors at work were measured by the Job Content Questionnaire (JCQ) which was translated into Thai (Karasek *et al*, 1998). The questionnaire consists of 3 dimensions of work (work demand, job control, and social support) with 24 items [work demand (4 items), job control (8 items) and social support from supervisor and co-workers (12 items)] on a 5-point scale varying from "totally disagree to totally agree". The sum of scores for each dimension were added to assign subjects into low (<mean-SD), moderate (mean  $\pm$  SD) or high (> mean +SD) level for that dimension. Job stress was calculated by the proportion of job demand versus job control. Subjects were assigned into groups of high stress (score >1) and low stress (score  $\leq$  1).

### Mental health

Mental health was assessed with the General Health Questionnaire (28 items) (GHQ28) which was translated into Thai (Goldberg and Hillier, 1979). The questionnaire has 4 subscales comprised of 7 questions each; Somatic Symptoms, Anxiety and Insomnia, Social Dysfunction and Severe Depression. The scores are calculated by using binary (0-0-1-1) scores. The sum of all the dimensions is used to assess mental health status. A score greater  $\geq$ 6 indicates poor mental health.

### Body height, body weight and body mass index measurements

All subjects removed their shoes before body weight (BW) was measured using a manual scale and body height (BH) was measured. Body mass index (BMI) was calculated as body weight (kg) divided by the square of the height (m<sup>2</sup>).

### Blood pressure measurements

Systolic blood pressure (SBP), diastolic blood pressure (DBP) and pulse rate

Table 1  
Characteristics of subjects.

Variables	Male (n=845)	Female (n=1,163)
	Mean (SD)	Mean (SD)
Physical health		
BMI (kg/m <sup>2</sup> )	23.7 (3.8)	23.6 (4.5)
Systolic blood pressure in mmHg	126.1 (13.7)	115.9 (15.8)
Diastolic blood pressure in mmHg	78.1 (10.6)	73.6 (10.6)
Waist circumference in cm	82.2 (10.2)	78.9 (10.6)
Working conditions		
Work hours /day	8.8 (1.7)	8.2 (0.9)
Work demand	13.5 (2.5)	13.2 (2.7)
Job control	25.5 (4.4)	23.5 (4.7)
Social support	48.6 (7.7)	49.3 (7.8)
Personal data		
Age in years	33.3 (7.9)	34.9 (8.9)
Working career in years	6.9 (6.2)	7.0 (6.4)
Work ability index	40.7 (4.6)	40.0 (4.6)
	<i>n</i> (%)	<i>n</i> (%)
Poor mental health with GHQ≥6	84 (9.9)	117 (10.1)
Smoking	278 (32.9)	12 (1.0)
Alcohol consumption	215 (25.5)	26 (2.2)
Lack of exercise	636 (75.3)	981 (84.4)
Position		
Manager	28 (3.3)	5 (0.4)
Supervisor	233 (27.6)	141 (12.1)
Operator	584 (69.1)	1,017 (87.5)
Workplace size		
Small	361 (42.7)	579 (49.8)
Medium	484 (57.3)	584 (50.2)

(PR) were measured using a digital blood pressure monitor (HEM-907, Omron, Tokyo, Japan) on the right arm while the subject was seated and had been at rest for at least 15 minutes. An average of 3 consecutive measurements was used for the reading.

### Statistical analyses

Data were expressed as means ( $\pm$ SD) and percentages. Multiple regression analysis (forward stepwise) was used to determine significant and independent correlates of WAI. The following factors

were included in the model as independent variables: age, psychosocial factors, mental health, and lifestyle. The statistical significance was set at  $p < 0.05$ . Statistical analysis was conducted using SPSS statistical package, version 11 for Windows.

### RESULTS

The general characteristics of the study subjects are shown in Table 1. The mean ages ( $\pm$ SD) of the males and females were 33.3 ( $\pm$ 7.9) and 34.9 ( $\pm$ 8.9) years,

Table 2  
Factors associated with WAI among male and female workers in stepwise multiple regression analysis.

Variables	$\beta$	Adjusted R <sup>2</sup>	<i>p</i> -value
Male			
Poor mental health	-0.360	0.094	0.000
Alcohol drinking	-0.870	0.127	0.000
Lower position	-1.304	0.151	0.004
Higher social support	0.092	0.169	0.000
Longer working hour	0.378	0.187	0.000
Depression	-0.733	0.190	0.032
Constant=38.572			
Female			
Poor mental health	-0.353	0.074	0.000
Higher social support	0.131	0.105	0.000
Increasing age	-0.074	0.120	0.000
Higher job control	0.112	0.130	0.000
Lower position	-1.217	0.138	0.001
Constant=42.361			

respectively. The mean number of years worked total and the mean number of hours worked per day in male were 6.9 ( $\pm 6.2$ ) and 8.8 ( $\pm 1.7$ ) and in females were 7.0 ( $\pm 6.4$ ) and 8.2 ( $\pm 0.9$ ), respectively. The mean BMI, SBP, DBP and waist circumference were all within the normal ranges for both males and females. The mean scores for work demand were 13.5 ( $\pm 2.5$ ) for males and 13.2 ( $\pm 2.7$ ) for females with a total possible score of 20. The mean of job control scores were 25.5 ( $\pm 4.4$ ) for males and 23.5 ( $\pm 4.7$ ) for females with a total possible score of 40. The mean scores for social support were 48.6 ( $\pm 7.7$ ) for males and 49.3 ( $\pm 7.8$ ) for females with a total possible score of 60. For mental health, 9.9% of the male subjects and 10.1% of female subjects had a GHQ score of  $\geq 6$ . The mean WAI was 40.7 ( $\pm 4.6$ ) in males and 40.0 ( $\pm 4.6$ ) in females. For males, the dimensions of mental health, social support, age and job stress showed a significant correlation with WAI.

For females, mental health, social support, work demand and age were significantly correlated with WAI.

The prevalences of current smoking, alcohol drinking and lack of exercise in males were 32.9, 25.4 and 75.3%, and in females were 1.0, 2.2 and 84.4%, respectively. More than half the subjects were operators. Fifty-seven percent of males and 50.2% of females were working in medium sized workplaces.

Fig 1 shows the WAI for male and female subjects in each age group. A decreasing WAI with increasing age was found in females, particularly in those  $\geq 45$  years old.

The results of stepwise multivariate linear regression analysis are shown in Table 2. For males the WAI independently correlated with mental health, alcohol drinking, position, social support, working hours and depression. For females the

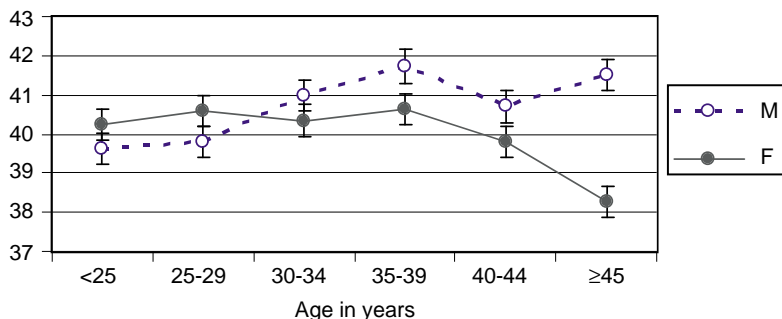


Fig 1—Mean WAI among each age group of male and female workers.

WAI independently correlated with mental health, social support, age, job control, position, alcohol drinking and workplace size.

### DISCUSSION

The results of this study showed the WAI of workers was associated with mental health, psychosocial factors at work, social support job control, working hours, position, alcohol drinking and age. These results support the findings of other studies which showed a relationship between WAI and psychosocial factors at work, mental health and lifestyle (Alavinia *et al*, 2007; Van den Berg, 2007, 2009).

This study found a negative relationship between age and WAI which corresponds to other studies (Ilmarinen, 1997; Kloimuller *et al*, 2000). However, this relationship was only found in females. This may be because male subjects in this study were younger and had fewer physical problems related to age and work ability.

A positive relationship between working hours and WAI was found among males workers in this study. This result was different from the study of Costa and Sartori (2007) who found that longer working hours reduced work ability. This may be because male subjects in this study were younger, and healthier.

A significant negative relationship between drinking alcohol and WAI in males was found in this study. This result is similar to other studies showing that drinking alcohol has a negative effect on work ability (Bugajska and Łastowiecka, 2005). Because there were only a

few female workers in this study who drank alcohol, the variable of alcohol drinking was exclude from analysis for women.

In this study, the mean WAI among male workers was 40.7 ( $\pm 4.6$ ) and among female workers was 40.0 ( $\pm 4.6$ ). These results are slightly lower than those of a study by Bugajska and Łastowiecka (2005) who found the mean WAI among factory workers was 41.1 ( $\pm 4.7$ ). This may be due to differences in work conditions between the two countries.

Our study found support from colleagues and supervisors was related to WAI, which is similar to the study by Bugajska and Łastowiecka (2005). Training programs or advice from colleagues and supervisors may make workers feel more confident in their work performance resulting in increased work ability.

We found that managers and supervisors had higher WAI than operators. This may be because managers and supervisors had more job control than operators. Therefore, operators could have more stress, which decreases WAI.

Since this study was of cross-sectional design causality could not be determined. However, these results suggest health promotion among workers should address working conditions and individual lifestyle

to reduce stress at work and improve work ability.

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