Socio-Demographic and Psychosocial Factors Associated with Physical Activity of Working Woman in Petaling Jaya, Malaysia

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ABSTRACT

Introduction: This study was conducted on 215 working women from four private corporate companies in a suburb in Malaysia to determine the factors related to their physical activity levels. **Methods**: Data were collected using a questionnaire which included socio-demographic characteristics, the International Physical Activity Questionnaire (IPAQ), perceived barriers and benefits to physical activity, self-efficacy to physical activity and an 8-item questionnaire on current behavioral stage of physical activity. **Results**: The majority of the respondents were Malay (81.9%) with 10.2% being Chinese and 7.9% Indian. Most of the respondents were executives (64.2%), while the rest were non-executives (24.7%) and managers (11.2%). The mean weight, height, BMI and waist circumference were 59.4±13.1 kg, 1.6±0.6 m, 23.7±4.8 kg/m² and 77.0±12.1cm respectively. In this sample, 24.7% and 7.9% were overweight and obese respectively, while 34% were at risk of abdominal obesity. A total of 28.8% of the respondents had low physical activity level, while 48.8% and 22.3% were in the moderate and high physical activity categories respectively. An association was found between monthly income (χ^2=110.17; $p<0.05$) and current behavioral stage of physical activity (χ^2=27.527; $p<0.05$) with physical activity, but no relationship was found between job category and physical activity category (χ^2=8.940; $p>0.05$). Physical activity category was also positively correlated with perceived barriers (r=0.227, $p<0.05$) and benefits to physical activity (r=0.280, $p<0.05$). However, physical activity was not associated with self-efficacy to physical activity. **Conclusion**: In this sample of working women, socio-demographic and psychosocial factors (except self-efficacy to physical activity) were found to have an association with physical activity level of the respondents. Further studies should be conducted to confirm these findings in the general working women population.

Key words: Physical activity, psychosocial factors, socio-demographic factors working women

INTRODUCTION

Regular physical activities along with a healthy diet are major components for the prevention and treatment of various chronic diseases such as heart diseases, cancer, obesity, osteoporosis, and psychological ailments. There is strong scientific evidence that a healthy diet and adequate physical activity (i.e. ≥30 minutes of moderate intensity physical activity, ≥5 days per week) play an important role in the prevention of

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these diseases (World Health Organization, 2006). Participation in physical activity on a regular basis has been shown to have a wide range of health benefits to women (Sit, Kerr & Wong, 2007). Further, it is indicated that psychological and behavioral variables associated with increased physical activity include higher self-efficacy for physical activity, greater perceived benefits of physical activity, greater enjoyment, lower levels of depression, higher incidence of self-regulating behaviours, more positive health and fitness (self-reported), and fewer perceived barriers to physical activity (Trost *et al.,* 2002).

There is a high prevalence of sedentariness in Malaysia. According to the National Health and Morbidity Survey II (Ministry of Health Malaysia, 1997), which was carried out on 32,936 adults aged 18 years and above, more than 60% were found to be physically inactive. The prevalence of women who never exercised was 75%. In the Malaysian Adult Nutrition Survey (MANS) in 2003, Malaysian adults were generally found to be sedentary with only 31.3% having ever exercised while the prevalence of women who ever exercised was only 22.3% (Poh *et al.*, 2010). On the other hand, the Third National Health and Morbidity Survey (NHMS II) in 2006 (Ministry of Health Malaysia, 2008) reports that the overall prevalence of physical inactivity was 43.7% among adults aged 18 years and above while the prevalence of physical inactivity among women was 50.5%.

The majority of modern workplaces have contributed to sedentariness as many employees are not physically active during working hours (Prodaniuk *et al.,* 2004). In a study carried out by Lim (2002) specifically on women workers in two factories in Bandar Baru Bangi, Selangor, more than 60% did no not meet the recommendation for physical activity to achieve health benefits. Moreover, approximately 18.2% of the women workers were found to be not exercising at all.

In view of the lack of published information on the determinants of physical activity particularly among women working in a private workplace setting, this study aims to report on physical activity levels of working women aged between 18 to 55 years and to examine the relationship between physical activity levels with socio-demographic and psychosocial factors.

METHODS

Subjects

A purposive sampling design was adopted for this study. A list of 100 corporate private listed companies in Petaling Jaya, Selangor was obtained. Ten companies were randomly selected but only four responded and agreed to participate in the study. The respondents were working women, randomly selected from the four corporate private companies. Participation in the study was limited to those who met the following criteria: (a) aged between 18 to 55 years; (b) able to provide written informed consent ; (c) not pregnant; and (d) have no serious medical conditions that could prevent them from answering questions or participating in physical activity and exercise. A total of 215 women responded to this study voluntarily.

Approvals to conduct this study were obtained from the Medical Research Ethics Committee, Faculty of Medicine and Health Sciences, Universiti Putra Malaysia. Permission was also obtained from the respective Human Resource Managers of the four companies selected before conducting the study. Written informed consent was elicited from the respondents prior to data collection.

Data collection

A questionnaire was prepared to obtain information on age, race, and highest educational level attained, present position in the organisation, marital status, income,

and average working hours per day of the respondents.

Body weight was measured (to the nearest 0.1 kg) using a Tanita digital weighing scale model 314 while height (to the nearest 0.1 cm) was measured using a SECA wall stadiometer model 206. Body mass index (BMI) was calculated using the formula: weight in kilograms divided by height in meters² and categorised according to WHO (2000) cut-off points. Waist circumference was measured using a non-elastic SECA measuring tape to the nearest 0.1cm. Waist circumference was taken as the circumference at the midway between the lowest rib and the iliac crest and was then classified based on (WHO/IOSF/IOTF, 1995) which is <80 cm for normal and $\geq$80 cm for at risk of abdominal obesity. Hip circumference was taken at the maximal protrusion of buttocks with the feet together. The measurements of the waist and hip circumferences were used to calculate the waist to hip ratio(WHR) and classified based on WHO/IOSF/IOTF (1995) which is <0.8 for normal and $\geq$0.8 for at risk of non-communicable diseases.

Assessment of physical activity

Physical activity level of the respondents was assessed through face to face interview using the International Physical Activity Questionnaire-short form (IPAQ, 2005). The IPAQ short form consists of seven items that identify frequency and time spent on walking and other moderate-vigorous intensity physical activities during the seven days prior to the questionnaire administration, and count only those sessions that last 10 minutes or more. All types of activities are included whether they are part of occupation, transportation, household chores, or leisure time activity. This short version comprises seven items on three specific types of physical activity which are walking, moderate intensity activity and vigorous-intensity activity.

Metabolic Equivalent (METs) values (multiples of the resting metabolic rate) were used for the analysis of IPAQ data. The IPAQ incorporates a scoring mechanism whereby each activity is assigned an intensity code expressed in terms of Metabolic Equivalents (METs). The MET is the ratio of metabolic rate during the activity as compared to the metabolic rate during rest. For each type of activity, the weighted MET minute per week is calculated as follows (IPAQ, 2005):

1. Walking MET-min/week = 3.3 x walking minutes x walking days
2. Moderate MET-min/week = 4.0 x moderate intensity activity minutes x moderate activity days
3. Vigorous MET-min/week = 8.0 x vigorous intensity activity minutes x vigorous activity days

The total physical activity MET-minute/week value was then computed by summing the walking, moderate and vigorous MET-minute/week scores. The scores were then categorised into low, moderate and vigorous physical activity levels according to the IPAQ categorical classification (IPAQ, 2005).

Current behavioral stage of physical activity

In order to measure the respondents' current behavioral stage of physical activity, a self reported stage of change measure developed by Martin *et al.* (2000) was used. This instrument consists of 8 statements and subjects were required to select only one statement that best described their current behavioral stage of physical activity. The best selected answer that described their current behavioral stage of physical activity was then converted to the 5 stages of change according to the Transtheoretical Model. The 5 stages in this model are (1) Pre-contemplation stage, (2) Contemplation stage, (3) Preparation stage, (4) Action stage, and (5) Maintenance stage. Those who selected statements 1 or 2 were categorised into the Pre-Contemplation stage and Contemplation stage respectively while those who selected either statements 3 or 4

were categorised into the Preparation stage. Those who were categorised into the Action stage were those who selected either statements 5 or 6 and finally those who selected either statements 7 or 8 were categorised into the Maintenance stage.

Perceived Benefits and Barriers to Physical Activity

Perceived benefits and perceived barriers to physical activity were measured using the Exercise Benefits and Barrriers Scale developed by Sechrist, Walker & Pender (1987). This instrument consists of 43 items. Twenty nine items are statements on perceived benefits of physical activity while the remaining 14 items relate to perceived barriers of physical activity. A 4-point Likert scale was used to indicate agreement. Scoring was done by summing the subscales to produce an overall score for each subscale with possible ranges of 29 to 116 for the perceived benefits subscale and 14 to 56 for the perceived barriers subscale. For the perceived benefits subscales, a higher score indicated that the person had a better perception of benefits to participate in regular physical activity whereas for the barriers scale, a higher score indicated that the person perceived greater barriers to participating in regular physical activity.

Self-efficacy to physical activity

To measure self-efficacy to physical activity, a scale adopted from McAuley (2000) was used. The scale is made up of 13 items consisting common reasons for preventing participation in physical activity (For example, "How confident are you to do physical activity if 'The weather is bad?'"). A rating scale of 0% (not at all confident) to 100% (highly confident) was used to rate each item on the scale. A total physical activity self-efficacy score was obtained by summing up the confidence ratings and dividing by the 13 items in the scale. A higher score indicated a higher self-efficacy to physical activity.

Statistical analysis

Data were analysed using the SPSS for Windows version 15.0. Descriptive statistics such as frequencies, means, standard deviations and percentages were used to describe variables, socio-demographic background, physical activity level, current behavioral stage of physical activity and psychosocial variables. Chi-squared and Pearson correlation tests were used to determine associations between variables. Statistical significance was set at $p<0.05$.

RESULTS

A total of 215 working women with a mean age of 30.1±7.6 years participated in this study. A majority of the respondents were Malay (81.9%), followed by Chinese (10.2%) and Indian (7.9%). Table 1 shows the demographic background of the respondents.

Most of the respondents were single (40.5%), 57.7% were married and a small percentage of them were divorced or widowed (1.9%). The majority had tertiary education with 7.9% having a Master's Degree, 59.1% a Bachelor Degree and 23.3% a Diploma. The remaining respondents (9.8%) had *Sijil Pelajaran Malaysia* (Malaysian Certificate of Education), *Sijil Tinggi Pelajaran Malaysia* (Higher School Certificate) or special certificate qualifications.

In terms of job categories, most of the respondents were executives (64.2%), with the remaining being non-executives (24.7%) and managers (11.2%). In terms of income earned, 26.5% of the respondents had a monthly income of between RM1000-RM1999 whereas 62.3% of the respondents' income fell within RM2000-RM4999. A minority had incomes above RM5000 (11.2%). Some 58.1% the respondents worked more than 8 hours per day while 41.9% worked 8 hours or less.

As shown in Table 2, the mean weight and BMI of the respondents were 59.4 ± 13.1

Table 1. Socio-demographic characteristics of respondents

Characteristics	n (%)	Mean± S.D
Ethnicity		
Malay	176 (81.9)	
Chinese	22 (10.2)	
Indian	17 (7.9)	
Age (years)		30.1±7.59
18-29	140 (65.1)	
30-41	52 (24.2)	
42-55	23 (10.7)	
Marital Status		
Single	87 (40.4)	
Married	124 (57.7)	
Divorced or widowed	4 (1.9)	
Position in the company		
Non-Executives	53 (24.6)	
Executives	138 (64.2)	
Managers	24 (11.2)	
Hours worked per day		
$\leq$ 8 hours per day	90 (41.9)	
> 8 hours per day	125 (58.1)	
Monthly income		
RM1000- RM1999	57 (26.5)	
RM 2000-RM4999	134 (62.3)	
> RM5000	24 (11.2)	

Table 2. Body weight, height, BMI, waist circumference and waist-to-hip ratio of respondents

Characteristics		n (%)	Mean± S.D
Weight (kg)			59.4 ± 13.1
Height (m)			1.6 ± 0.6
BMI (kg/m²)			23.7± 4.8
Underweight	(<18.50 kg/m²)	19 (8.8)	
Normal	(18.50 - 24.99 kg/m²)	126 (58.6)	
Overweight	($\geq$25.00-29.99kg/m²)	53 (24.7)	
Obese	($\geq$30.00 kg/m²)	17 (7.9)	
Waist Circumference (cm)			
Normal (<80cm)		142(66.0)	
At risk ($\geq$80cm)		73(34.0)	
Waist Hip Ratio (WHR)			
Normal (<0.8)		97 (44.7)	
At risk ($\geq$0.8)		119 (55.3)	

kg and 23.7 ± 4.8 kg/m², respectively. The prevalence of overweight and obesity were 24.7% and 7.9% respectively while the prevalence of abdominal obesity was 34%.

Table 3 shows the distribution of physical activity levels among the respondents. Overall, 48.8% of the respondents were in the moderate physical activity category, while 22.3% had high physical activity level. On the other hand 28.8% of the respondents had low physical activity level. The mean scores of perceived benefits and perceived barriers to physical activity were 89.1 ± 8.8 and 41.01 ± 5.0, respectively and the mean value of self-efficacy to physical activity was 39.6% ± 17.4%. Correlations were also found between perceived benefits, perceived barriers and self-efficacy to physical activity with physical activity score. Perceived benefits score (r=0.280, *p*<0.01) and perceived barriers score (r=0.227, *p*<0.01) were positively correlated with physical activity score. However, the self-efficacy score did not correlate with the physical activity score. (r=0.111, *p*>0.05).

Table 4 shows the distribution of respondents according to their current behavioral stage of physical activity and exercise. A small percentage (3.3%) of the respondents fell in the pre-contemplation stage, 22.8% were contemplating to start exercising and be physically active while 52.5% of the respondents were in the preparation stage. A total of 14.9% were active as they fell in the action stage and only 6.6% were physically active and exercising regularly as they were in the maintenance stage.

As presented in Table 5, there is no significant association between job category and physical activity (χ^2=8.940, *p*> 0.05). However, there was a significant association between monthly income and physical activity (χ^2=11.017, *p*<0.05). Results also showed that current behavioral stage of change was significantly associated with physical activity levels among the respondents (χ^2=26.037, *p*<0.05).

DISCUSSION

This study determined the prevalence of physical activity level among working women and assessed the relationships between socio-economic and psychosocial factors with physical activity. A majority of the respondents were of Malay (81.9%), single (40.5%), non-executives (64.2%) with 62.3% having a monthly income of between RM2000 to RM4999. Results of this study also showed that 28.8% of the respondents fell in the low physical activity category. In addition, results also showed that 26.1% were in both the pre-contemplation and contemplation stages. The study showed that most of the respondents were of normal weight (58.6%) with 32.6% being both overweight and obese while 8.8% were underweight. The findings from this study

Table 3. Distribution of respondents by physical activity levels and mean scores of perceived benefits, perceived barriers and self-efficacy to physical activity

Characteristics	n (%)	Mean± S.D
Physical Activity Levels		
Low	62 (28.8)	
Moderate	105 (48.8)	
High	48 (22.3)	
Perceived benefits to physical activity		89.05 ± 8.84
Perceived barriers to physical activity		41.01 ± 4.95
Self-efficacy		39.57% ±17.39%

Table 4. Distribution of respondents by current behavioral stage of physical activity

Level	n (%)	Current Stage of Change	n (%)
1. I do not exercise or walk regularly now, and do not intend to start in the near future.	7 (3.3)	Pre-contemplation	7 (3.3)
2. I do not exercise or walk regularly, but I have been thinking of starting.	49 (22.8)	Contemplation	49 (22.8)
3. I am trying to start to exercise and walk or I exercise or walk infrequently.	62 (28.8)		
4. I am doing vigorous exercise less than 3 times per week or moderate or moderate physical activity less than 5 times per week.	51 (23.7)	Preparation	113 (52.5)
5. I have been doing moderate physical activity 5 or more times per week (or more than 2 ½ hours per week) for the past 1-6 months.	22 (10.2)		
6. I have been doing moderate physical activity 5 or more times per week (or more than 2 ½ hours per week) for the past 7 months or more.	10 (4.7)	Action	32 (14.9)
7. I have been doing moderate vigorous exercise 3-5 times per week for the past 1-6 months.	7 (3.3)		
8. I have been doing vigorous exercise 3 to 5 times per week for the past 7 or more months	7 (3.3)	Maintenance	14 (6.6)

Table 5. Distribution of physical activity level of the respondents by socio-demographic and psychosocial factors

	Physical Activity		
	Low n(%)	Moderate n(%)	High n(%)
Monthly income			
RM1000- RM1999	21(36.8)	30(52.6)	6(10.6)
RM 2000-RM4999	37(27.6)	59(44.0)	38(28.4)
≥RM5000	4(16.7)	16(66.7)	4(16.6)
		(χ^2=11.017, p<0.05)	
Job category			
Non- executive	19(35.8)	29(54.7)	5(9.5)
Executive	37(26.8)	62(44.9)	39(28.3)
Manager	6(25.0)	14(58.3)	4(16.7)
		(χ^2=8.940, p>0.05)	
Current behavioral stage of physical activity			
Pre-contemplation & Contemplation	28(50.9)	20(36.4)	7(12.7)
Preparation	29(25.7)	62(54.9)	22(19.4)
Action & Maintenance	5(10.6)	23(48.9)	19(40.5)
		(χ^2=26.037, p<0.05)	

do not show an association between BMI status and physical activity level. In addition, results also showed that was no relationship between waist circumference, waist hip ratio and physical activity level.

Levels of physical activity have been shown to be strongly related to occupational class or socio-economic status in Western countries. Physical activity was shown to be more prevalent among professionals and skilled non manual workers for females in Ireland (Livingstone, Robson & McCarthy, 2001) and the United States (Grzywacz & Marks, 2001). However our study indicated no association between job category and physical activity level among the respondents.

It has been consistently observed in other studies that individuals in both high and middle income and with a higher socio-economic status have a greater probability of engaging in an recreational activity (Varo, Martinez-Gonzalez & Irala Estevez, 2003). Similarly, it was observed that Mexican women with high socio-economic status also have a greater possibility of being physically active (Hernández & Ibáñez, 2010). A study done by Burton, Turrel & Oldenburg (2003), found that the three socio-economic groups (low, middle, high), differ significantly in education, employment status and income level (p=0.000). Participants in the higher SES group tend to have tertiary level education, full time employment in managerial or professional occupations and higher participation in physical activity. Meanwhile, those who are less educated are in the labour force and are mainly dependent on welfare for their income and are reportedly not physically active.

The Prochaska and DiClemente stages of behaviour change model (Prochaska & DiClemente, 1983) suggests that individuals engaging in a new behaviour move through a series of stages of change and utilise different processes to support the changes at different stages. These stages have been defined as Pre-contemplation, Contemplation, Preparation, Action and Maintenance.

The application of the stage of change framework to physical activity and exercise is essential as this model takes into consideration both actual physical activity and exercise habits and also intentions regarding future exercise behaviour. Results of a study done by Nishida *et al.,* (2003) show that the majority of the respondents (39%) are in the contemplation stage. In our study, the stages of change model were applied to obtain information regarding the respondents' actual physical activity and exercise behaviour. It was found that the stage of change of the respondents was positively associated with their physical activity level (χ^2=*51.923, p<0.05*).

Findings obtained by a study by Ammouri *et al.* (2007) among adults in Jordan indicate that perceived self-efficacy is the strongest perceptual factor associated with physical activity. In addition, a study done among an ethnically diverse sample of 2636 women enrolled in a North American health maintenance programme by Sternfeld *et al.* (1999) reveal that women with high levels of physical activity self-efficacy are two and four times more likely than those with low levels of physical activity self-efficacy to be in the highest quartile for physical activity. However, the present study found no significant association between self-efficacy and physical activity among the respondents.

Adults who perceive greater benefits of physical activity and fewer barriers are more likely to be physically active (Ammouri *et al.,* 2007). Findings from our study showed that a higher perception of benefits of physical activity was associated with higher physical activity participation. Furthermore, individuals who perceive more exercise benefits and fewer exercise barriers are typically more active than those who report high perceived barriers and low perceived benefits (Nahas *et al.,* 2003). Results from our study also showed that respondents who obtained higher perceived barriers score were also reportedly to be physically active (r=0.227, *p*<0.01). However, self-efficacy

scores showed no correlation with physical activity scores. (r=0.111, p>0.01). This showed that as perceived benefits to physical activity increased, the physical activity also increased. However, as perceived barriers to physical activity increased, the likelihood of not participating in physical activity also increased. Likewise, a study done by Jackson-Elmoore (2007) indicates that one of the physical activity barriers which is weight does not obstruct the respondents to engage in physical activity/exercise as they are more likely to believe they exercise enough if they perceive themselves as underweight or normal weight. Although various studies have shown no association between perceived barriers and physical activity, further investigation into this area is essential to gain a fuller understanding.

CONCLUSION

The findings of the present study revealed that less than a third of the respondents had low physical activity levels and approximately 26% of them were in the pre-contemplation and contemplation stages. It was also noted that socio-demograpic and psychosocial factors (except self-efficacy to physical activity) had an association with physical activity level of the respondents. However, further studies are essential to confirm these finding among the general working women population. Attempts to design health promotion programmes for these women should consider and incorporate the factors identified.

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