UNIVERSITI PUTRA MALAYSIA

ASSOCIATION BETWEEN NUTRITIONAL AND PSYCHOSOCIAL FACTORS AND PHYSICAL ACTIVITY LEVELS AMONG WORKING WOMEN

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By

SITI AFFIRA BT KHUSANI

Thesis Submitted to the School of Graduate Studies, Universiti Putra Malaysia, in Fulfilment of the Requirements for the Degree of Master of Science

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To Papa and Mama, my pillars of strength,

I dedicate this thesis to the both of you.

Abstract of thesis presented to the senate of Universiti Putra Malaysia in fulfilment of the requirement for the degree of Masters of Science

ASSOCIATION BETWEEN NUTRITIONAL AND PSYCHOSOCIAL FACTORS AND PHYSICAL ACTIVITY LEVELS AMONG WORKING WOMEN

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January 2012

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Many studies have shown that physical activity along with a healthy diet are major components in the prevention of chronic diseases. A cross-sectional study was conducted among 215 working women aged between 18 to 55 years from four private corporate listed companies in Petaling Jaya to determine factors related to their physical activity levels. A self-administered questionnaire which include socio-economic profile, the International Physical Activity Questionnaire (IPAQ), 2-day 24 hour dietary recall, psychosocial factors which determined perceived barriers and benefits to physical activity, self efficacy to physical activity and an 8-item questionnaire on current behavioural stage of physical activity were used to obtain information for this study. A majority of the respondents were Malays (81.9%),

followed by Chinese (10.2%) and Indians (7.9%) and their mean age was 30.14 ± 7.59 years. Most were executives (63.3%), while the remaining respondents were non-executives (25.6%) and managers (11.2%). The mean weight, height, body mass index (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. There were 24.7% and 7.9% who were overweight and obese respectively while 34% were at risk of abdominal obesity. About 28.8% of the respondents were in the low physical activity level category, whereas 48.8% were in the moderate and 22.3% were in the high physical activity categories. The respondents' average energy intake was 1404.7±346.7kcal/day.

For socio-demographic factors, only income showed an association with physical activity level while no correlations were found between nutritional factors and physical activity level. For psychosocial factors, perceived barriers to physical activity ($r= 0.222$, $p<0.05$) and perceived benefits to physical activity ($r=0.227$, $p<0.05$) were positively correlated with physical activity. However, physical activity was not correlated with self-efficacy to physical activity. In addition, respondents who are active based on their current behavioural stage of physical activity were in the high physical activity category ($\chi^2 = 51.923$; $p < 0.05$) and those with middle income were in the high physical activity category ($\chi^{2=} 11.017$**;** $p < 0.05$).

Data obtained were analyzed by using SPSS for Windows version 13. Multivariate analysis for contributors of physical activity showed that current behavioural stage of physical activity (contemplation and preparation stages) and perceived benefits to

physical activity were found to be significant in explaining physical activity among working women. The R-squared (Coefficient of Determination) of 0.165 implied that three predictor variables (contemplation stage, preparation stage and perceived benefits to physical activity) explained about 16.5% of the variation in physical activity ($R^2 = 0.165$, F (204, 3) = 13.766; p = 0.0001).

Further studies are essential to confirm these finding among the general working women population. Attempts to design health promotion programs on physical activity for these women should take into consideration and incorporate the factors identified**.**

Abstrak tesis yang dikemukakan kepada Senat Universiti Putra Malaysia sebagai memenuhi keperluan untuk Ijazah Master Sains

PERKAITAN ANTARA FAKTOR PEMAKANAN DAN PSIKOSOSIAL DAN TAHAP AKTIVITI FIZIKAL DIKALANGAN WANITA BEKERJA

Oleh

SITI AFFIRA BT KHUSANI

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Banyak kajian telah menunjukkan bahawa aktiviti fizikal berserta diet yang sihat adalah komponen utama dalam pencegahan penyakit kronik. Satu kajian keratan rentas telah dijalankan di kalangan 215 wanita yang bekerja yang berusia antara 18 hingga 55 tahun dari empat syarikat korporat swasta di Petaling Jaya untuk menentukan faktor-faktor yang berkaitan dengan tahap aktiviti fizikal masing-masing. Satu soal selidik yang ditadbir sendiri termasuk profil sosio-ekonomi, faktor-faktor pemakanan, soal selidik "International Physical Activity Questionnaire" (IPAQ), soal selidik berkaitan faktor-faktor psikososial seperti persepsi halangan and faedah terhadap aktiviti fizikal, kebolehan sendiri untuk melakukan aktiviti fizikal

dan persepsi imej tubuh terhadap aktivi fizikal dan soal selidik lapan perkara berkenaan tahap semasa tingkah laku aktiviti fizikal telah digunakan untuk mendapatkan maklumat untuk kajian ini.

Majoriti responden adalah Melayu (81.9%), diikuti oleh Cina (10.2%) dan India (7.9%) dan berumur 30.14 ± 7.59 tahun secara purata. Kebanyakan antara mereka merupakan eksekutif (25.6%) dan selainnya merupakan bukan eksekutif (25.6%) dan pengurus (11.2%). Min berat, tinggi, BMI dan lilitan pinggang responden masing-masing adalah 59.4 ± 13.1 kg, 1.6 ± 0.6 m, 23.7 ± 4.8 kg / m^2 dan 77.0 ± 12.1cm. Bagi faktor berat badan, 24.7% dan 7.9% daripada responden masing-masing mempunyai berat badan berlebihan dan adalah obes manakala 34% daripada responden mempunyai risiko kegemukan di abdomen. 28.8% daripada responden tergolong dalam kategori tahap aktiviti fizikal yang rendah manakala yang selebihnya tergolong dalam tahap aktivi fizikal yang sederhana (48.8%) dan tahap aktiviti fizikal yang tinggi (22.3%).

Bagi faktor-faktor sosiodemografi, hanya faktor pendapatan menunjukkan hubungkait dengan tahap aktiviti fizikal manakala tiada perkaitan dijumpai diantara faktor-faktor nutrisi dan tahap aktiviti fizikal. Bagi faktor-faktor psikososial, persepsi halangan ($r= 0.222$, $p<0.05$) dan persepsi faeadah terhadap tahap activiti fizikal ($r=0.227$, $p<0.05$) telah menunjukkan korelasi yang positif terhadap tahap aktiviti fizikal. Walau bagaimanapun, tiada korelasi yang dijumpai antara kebolehan sendiri melakukan aktiviti fizikal terhadap tahap aktiviti fizikal. Responden yang

aktif berdasarkan tahap semasa tingkah laku aktiviti fizikal tergolong dalam kategori tahap fizikal aktiviti yang tinggi (χ^2 = 51.923; $p < 0.05$) dan responden yang berpendepatan sederhana tergolong dalam kategori tahap fizikal activiti yang tinggi ($\chi^{2=}$ 11.017**;** $p < 0.05$)

Data-data yang diperolehi dianalisis menggunakan SPSS untuk windows versi 13. Analisis multivariat menunjukkan secara signifikan bahawa tahap semasa tingkah laku aktiviti fizikal (faktor kontemplasi dan persediaan) dan persepsi faedah terhadap aktiviti fizikal merupakan penyumbang kepada tahap activiti fizikal di kalangan wanita berkerja. Nilai R^2 sebanyak 0.165 menunjukkan bahawa sebanyak 16.5% perubahan dalam variable kriterion adalah disebabkan oleh perubahan dalam variable peramal. ($R^2 = 0.165$, $F(204,3) = 13.766$; $p = 0.0001$).

Kajian ini mencadangkan agar faktor-faktor yang telah dikenalpasti diterap dalam cubaan untuk merangka program-program kesihatan berkaitan dengan aktiviti fizikal khas untuk wanita-wanita ini.

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I certify that an Examination Committee has met on 16 January 2012 to conduct the final examination of Siti Affira Khusani on her thesis entitled **"Association between nutritional and psychosocial factors with physical activity level among working women"** in accordance with Universiti Pertanian Malaysia (Higher Degree) Act 1980 and Universiti Pertanian Malaysia (Higher Degree) Regulations 1981. The Committee recommends that the student be awarded the (Name of relevant degree).

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DECLARATION

I declare that the thesis is my original work except for quotations and citations which have been duly acknowledged. I also declare that it has not been previously, and is not concurrently, submitted for any other degree at Universiti Putra Malaysia or at any other institution.

SITI AFFIRA KHUSANI

Date: 16 January 2012

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BMI	Body Mass Index
CDC	Centers for Disease Control
IPAQ	International Physical Activity Questionnaire
MET	Metabolic Equivalent of Task
WHO	World Health Organization
WHR	Waist Hip Ratio

CHAPTER 1

INTRODUCTION

1.1 Background

Physical activity is now regarded as a major behavioral factor necessary for preventing chronic diseases (USSD, 1996). Despite the extensive evidence for the physical, social and psychological benefits of regular physical activity and years of individually focused interventions, exercise and total physical activity levels continues to decline in industrialized countries (Armstrong, Bauman, & Davies, 2000; Brownson, Boehmer, & Luke, 2005). The need for a wide-ranging approach to address the increasing chronic disease burden associated with physical inactivity is now widely acknowledged (WHO, 2004).

Not many studies that have been carried out about physical inactivity among women especially in a workplace setting. Numerous studies have shown that despite the positive benefits of physical activity many still tend or choose to be sedentary and physically inactive. In a study by Okano et al. (2003), engagement in physical activity is comparatively low cost preventive intervention and flexible in its implementation. The preventive impact of sport activity on health is diverse. According to USDHHS (2007), despite the widespread efforts to encourage physical activity in the population, the percentage of adults who engage in regular physical activity is low. However, the importance of physical activity as a mechanism to

enhance health and to reduce the risk of various chronic diseases is well known and documented (US DHHS, 2000). There is strong scientific evidence that 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 these diseases (WHO, 2005). Studies have shown that people who engage in physical activity tend to be healthier than their physically inactive peers and they experience less health problems such as obesity, cardiovascular disease, type 2 diabetes, osteoporosis, and cancer particularly for colon, breast and prostate cancer (Frienderich, 2001). Generally physical inactivity is estimated to cause 1.9 million deaths globally and this causes globally, about 10-16% of cases of each of breast cancer, colon and rectal cancers and diabetes mellitus, and about 22% of ischemic heart disease (WHO, 2002). People who do not achieve the minimum physical activity recommendation which is 30 minutes of moderate intensity activity preferably on all days of the days of the week may increase their risk of getting cardiovascular disease up to 1.5 times (WHO, 2003a)

In addition, obesity is a threat to the health of the population and many studies have shown that it could lead to cancer, hypercholesterolemia, diabetes mellitus, metabolic disorders, and disability in adulthood (Krauss and Winston, 1998; Takeshita and Marimoto, 2000; Bray, 2002; Ferraro *et al*., 2002; Florentino, 2002). Studies have shown that obesity is associated with an increase in the prevalence of asthma, cancer of the endoterium, breast, colon, and gallbladder especially in the female population (Bray, 2002; Chen *et a*l., 2002).

In Malaysia, studies have revealed moderate to high prevalence of overweight and obesity in adult males and females in both rural and urban areas (Ismail et al., 1995, Ng, Tee & Azriman, 1995; Chee et al., 1996; Khor et al., 1999). Based on the National Health and Morbidity Survey II (Ministry of Health, 1997) which was carried out on a nationwide representative sample of adults in Malaysia, the age-adjusted prevalence of overweight and obesity among the general women population was 21.4% and 7.6% respectively (Lim et al., 2000). Ethnic differences have also been observed. For example, the age-adjusted prevalence of overweight and obesity for Malay and Indian women was higher than that for Chinese women.

There is a high prevalence of sedentariness in Malaysia. According to the National Health and Morbidity Survey II (NHMS II, 1996) (Ministry of Health Malaysia, 1997), which was carried out on 32,936 adults aged 18 years and above in Malaysia, 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) (2003), it was found that Malaysian adults were generally sedentary whereby only 31.3% of them ever exercised while the prevalence of women who ever exercised was only 22.3% (Poh *et al*., 2010). On the other hand, in the Third National Health and Morbidity Survey (NHMS III, 2006) (Ministry of Helath Malaysia, 2008), it was reported that the overall prevalence of physical inactivity was 43.7% among adults aged 18 years and above whereas the prevalence of physical inactivity among women was 50.5%.

In 2006, the Malaysia NCDS-1 surveillance reported the prevalence of physical inactivity among Malaysians was 60.1%. It was estimated that about 7.2 million or one in two for men and women, aged 25-64 years were physically inactive. In this study, the prevalence of physical inactivity among women was 50.5%. At the same time, the NCD reported the prevalence of overweight and obesity were 31.6% and 6.3% respectively. It was estimated about one in two adults aged 25 to 64 years were either overweight or obese (NCD, 2006). On the other hand, in the Third National Health and Morbidity Survey (NHMS III, 2006) it is reported that the prevalence of overall physical inactivity was 43.7% among adults aged 18 and above.

Physical activity (PA) has numerous physical and mental health benefits for people of all ages and ethnic backgrounds (US DHHS, 1996). Psychological and behavioral variables associated with increased PA include higher self-efficacy, greater perceived benefits of PA, greater enjoyment, lower levels of depression, higher incidence of self-regulating behaviors, more positive health and fitness (self-reported), and fewer perceived barriers to PA (Trost et. al., 2002)

Regular physical activity can improve women's health and help prevent many of the diseases and conditions that are major causes of death and disability for women around the world (WHO, 2004). There are also studies that have indicated that more active women exhibit lower mortality rates (Gregg et al., 2003), improved bone density (Kemmler et al, 2003), and reduced CVD risk factors (Carnethon, 2003) compared to those who are sedentary.

Physical inactivity has increasingly been recognized as an important risk factor associated with morbidity and mortality in adults (CDC, 1994 and US DHHS, 1996). Despite evidence on the social, health, and personal benefits of physical activity, many people still choose not to exercise (US DHHS, 2000). Understanding why people choose to be physical inactive has been a source of discussion in the past years and research has revealed many influential determinants of physical activity. The known determinants associated with physical inactivity include (a) personal attributes (e.g., demographics, activity history, psychological traits, knowledge, attitudes and beliefs) and (b) environmental factors (e.g., access to facilities, time and social support). Therefore, understanding physical inactivity in women is important because women are, on average, more sedentary throughout their lives than are men (Bonheur & Young, 1991).

1.2 Problem statement

The workplace has been identified by various governments as a key setting to promote physical activity, due in part to the accessibility of people within their occupation (Shepard, 1996). However, the modernization of today's workplace has contributed to physical inactivity, as many workers are sedentary during working hours (Stokol et al., 1996). A study carried out by Lim (2000) specifically among women workers in two factories in Bandar Baru Bangi reported that more than 60% of them do no not meet the recommendation for physical activity to achieve health benefits. Moreover, approximately 18.2% of women workers were found not to be

exercising at all. Prodaniuk et. al, 2004 also indicated that in a workplace setting, the majority of modern workplaces have contributed to sedentariness, as many employees are not physically active during working hours.

However in Malaysia, not many studies have been done regarding the factors that are associated with physical activity particularly among women working in the private workplace setting as compared to that have been done in factories and also in the government worksite setting. Therefore, this study has been conducted to determine the factors related to physical activity level among this population. In addition, a better understanding of the factors that are related to physical activity is essential as the expected findings of this study may be useful in developing an effective physical activity intervention and promotion in the work place setting specifically for women.

The following are the research questions that are addressed in this study:-

1. What is the physical activity level among the working women?
2. Which of the factors identified (socio-demographic factors, nutritional factors and psychosocial factors) contributed the most towards the physical activity levels of the working women?

1.3 Significance of the study

Although physical activity has important health benefits, many people are not physically active. Therefore the results of this study are expected to give an in depth information on the working women's physical activity level, BMI status, body image perception, self efficacy for physical activity and exercise, main benefit and barrier in physical activity and exercise, current behavioral stage of physical activity and exercise as well as daily energy intake of the working women. The results of this study can contribute and update the descriptive data on physical activity levels and other factors related to it. This information can be used as references by other community-based researchers, health and wellness group and other health-related organizations to implement physical activity programs particularly among working women.

This study may also assist to promote physical activity and create awareness on how important it is to be physically active. Since there is a lack of information on physical activity among Malaysian working women, the results from this study could provide useful insights and could be useful to develop physical activity promotion in worksites particularly targeting women in workplace. Not only that the findings from this study could also contribute to the body of knowledge specifically in the scope of physical activity.

In addition, once factors that are associated with physical activity are determined, prevention and promotion programs can then be planned and implemented emphasizing on the determined factors. For example, there are many ways in which physical activity can be promoted by various parties which may include displaying motivational or informative posters, signage or brochures about the benefits of physical activity and some tips on getting active, promoting physical activity opportunities through email, company intranet or websites, links to the "*be active*" website, notice boards and newsletters and providing on-site facilities such as gym or aerobic classes. Once these types of activities have been implemented, it should then be evaluated for their effectiveness in increasing physical activity particularly among these working women.

1.4 Objectives

The objectives of the study are as follows:

1.4.1 General objective:

To determine the association between nutritional and psychosocial factors with physical activity levels among working women.

1.4.2 Specific objectives:

1. To assess the physical activity levels, socio-demographic factors, nutritional factors and psychosocial factors among working women.

2. To examine the association between socio-demographic factors (age, ethnicity, marital status, educational attainment, work position, income and working hours) and physical activity levels among working women.

3. To examine the association between nutritional factors (body mass index, waist circumference, waist-hip ratio and dietary intake) and physical activity levels among working women.

4. To examine the association between psychosocial factors (current behavioral stage of physical activity, perceived benefit, barriers and self efficacy to physical activity and body image perception) and physical activity levels among working women.

5. To examine the contributions of socio-demographic factors, nutritional factors and psychosocial factors towards physical activity levels among working women.

1.5 Null Hypotheses

1. There are no associations between physical activity level among working women with the following factors:

    a) Socio-demographic background

    b) Nutritional factors (body mass index, waist circumference waist hip ratio and dietary intake).

c) Psychosocial factors (current behavioral stage of physical activity, perceived benefits and barriers and self efficacy to physical activity and exercise and body image perception).

2. There are no significant contribution of socio-demographic factors, nutritional factors and psychosocial factors towards physical activity levels among working women.

1.6 Conceptual Framework

The purpose of this study is to determine the factors related to physical activity levels among working women. Figure 1.1 shows the conceptual framework of this study which covers four variables that has been found in various studies to be associated with the physical activity levels of the working women. These independents variables are grouped into four main groups which are socio-demographic factors, nutritional factors and psychosocial factors.

The first variable that was analyzed is sociodemographic factors. This variable includes age, ethnicity, education level, working hours per day and position in the company. Many studies have reported that physical activity levels was associated with socio-demographic factors such as ethnicity, gender, age, income and educational level (Arnio, 2003; Schmitz et al., 2002 & Gordon-Larson et al., 2000; Trost et al., 2002; Sternfield et al., 2000; Orsini et al., 2006; Armstrong et al., 2000; Hernández & Ibáñez, 2010; Platnikoff et al., 2004).

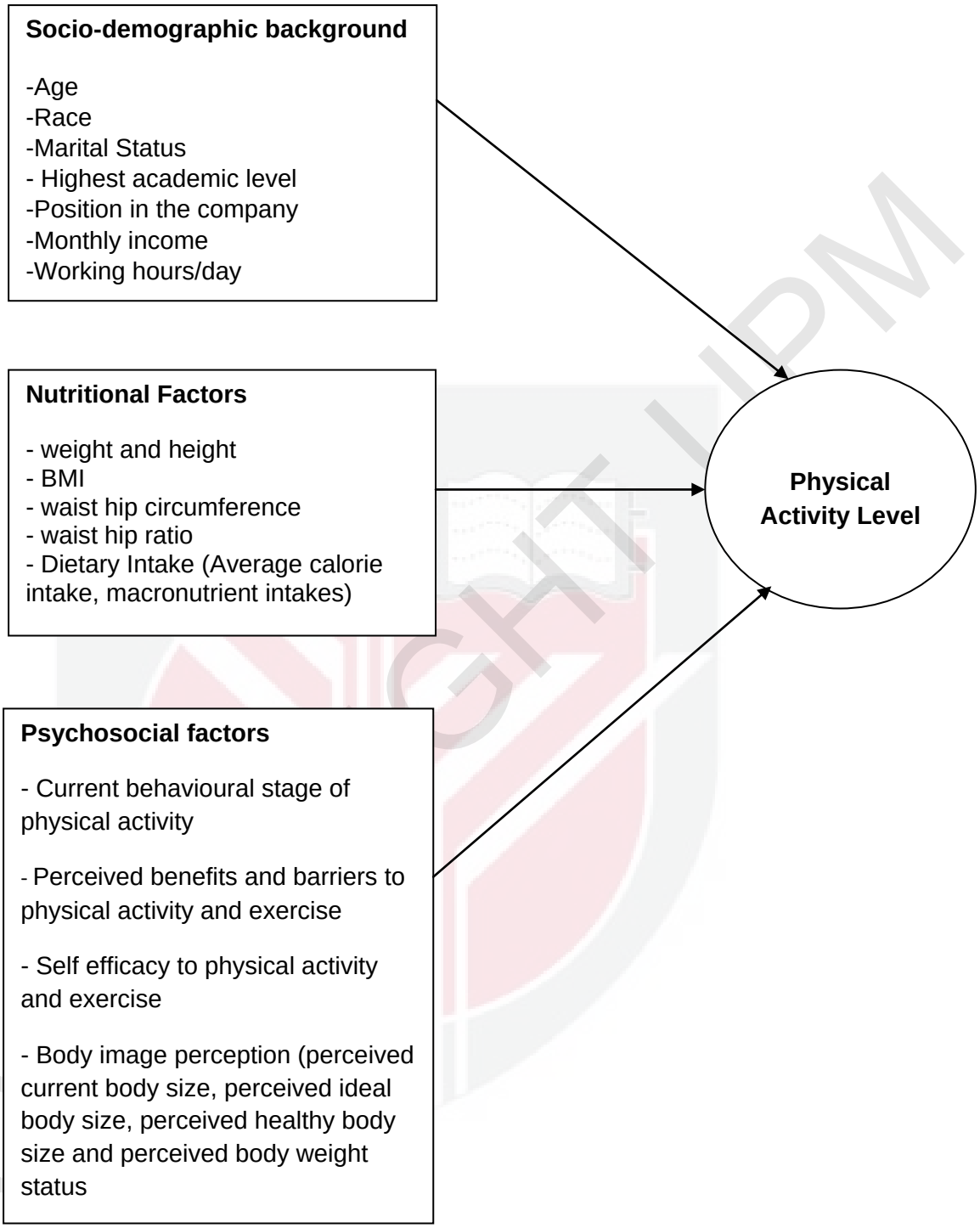

Figure 1.1: Conceptual framework of the study

The second variable analyzed was nutritional factors which were body mass index, waist circumference, waist hip ratio and dietary intake. BMI was found to be associated with physical activity (Salmon et al., 2000; Atlantis et al. 2007; Macera et al., 2005). A non significant correlation between caloric intake and macronutrient intakes with physical activity was found in a study by Camoes & Lopes (2006).

The third variable is the psychosocial factors. This will cover four aspects which include current behavioral stage of physical activity, perceived barriers and benefits to physical activity and exercise , self efficacy to physical activity and and body image perception. Current behavioral stage of physical activity was based on the stages of change concept from Prochaska and DiClimente's Transtheoretical model. This model has been used extensively to study different health behaviors including exercise (Prochaska and Diclementi, 1992) and comprised of 5 stages of change which are pre-contemplation, contemplation, preparation, maintenance and action. Studies have shown that these stages of change have shown influence to physical activity (Sorenson & Gill 2007; Oka, 2000; Whitehall et al., 2000; Kearney et al., 1999).

Many studies have reported that psychosocial factors (self efficacy, perceived barriers and benefits to physical activity) are also potential factors that may be associated with physical activity among working women (Ammouri *et al.*, 2007; Ball et al., 2007; Brown, 2005; Young & Stewart, 2006; Nahas et al, 2003;

Pender et al, 2002; Wilbur et al., 2003; McAuley *et al.*, 1994; Sternfeld *et al.*, 1999). Further, many studies have reported that body image perception were also associated with physical activity levels (Scherezade K, 2009; Kruger, et al., 2008; Plotnikoff, 2007; Annesi, 2007). Overall, these mentioned factors were hypothesized as contributors to physical activity among working women

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