ORIGINAL ARTICLE

Physical Inactivity among Health Staff: What Influences the Behaviour?

Nurhaliza Zakariah[1], Huda Zainuddin[1], Priya Ragunath[2], Feisul Idzwan Mustapha[2]

[1] Department of Community Health, Faculty of Medicine and Health Sciences, Universiti Putra Malaysia, 43400 Serdang, Selangor, Malaysia
[2] Disease Control Division, Ministry of Health Malaysia, Federal Government Administrative Centre, 62590, Putrajaya, Malaysia

ABSTRACT

Introduction: Physical inactivity has been recognised as the fourth leading risk factor for mortality worldwide. Individuals who are physically inactive have an increased risk of 20% to 30% of dying prematurely. Individuals who fulfil the minimum recommendations of physical activity can reduce the development of Non-Communicable Diseases. In 2015, 33.5% of Malaysian adults were reported to be physically inactive. Various factors were found to be associated with physical activity participation and these factors need to be explored. **Methods:** A cross-sectional study using proportionate simple random sampling was conducted. A total of 310 health staff were sampled according to the proportion from five divisions and data were collected using a self-administered questionnaire. IBM SPSS version 22.0 were used to analyse the data. Predictors for physical activity were also determined. **Results:** The response rate was 97.7% (303 out of 310). The prevalence of physical inactivity among respondents was 37.6%. The predictors for physical inactivity were smoker/ex-smoker (aOR=2.308, p=0.027), certificate/diploma education (aOR=2.135, p=0.008), personal barrier (aOR=1.055, p=0.017) and social environment barrier (aOR=1.106, p =0.025). **Conclusion:** People that have a higher possibility of being physically inactive were those with certificate or diploma education and smokers or ex-smokers. Those with personal barriers and social environment barriers likewise have higher probability of being physically inactive. Thus, appropriate health interventions should be developed by taking these factors into consideration to promote physical activity among the health staff.

Keywords: Associated factors, Government servant, Health staff, Physical activity barrier, Physical inactivity

Corresponding Author:
Dr Huda Zainuddin
Email: hidazai@upm.edu.my

INTRODUCTION

Physical activity (PA) has been acknowledged to benefit humans in terms of psychosocial health, improve functional ability and improve general quality of life (1). The National Institute of Health (NIH) Consensus Development Panel on Physical Activity and Cardiovascular Health defined PA as "any bodily movement produced by skeletal muscles that requires energy expenditure" and produces overall health benefits (2). Adequate levels of PA could improve muscular and cardiorespiratory fitness; improve bone and functional health; reduce the risk of hypertension, coronary heart disease, stroke, diabetes, breast and colon cancer; reduce the risk of falls as well as hip or vertebral fractures; and are fundamental to energy balance and weight control (3,4). Regular PA not only improves physical health but also benefit in better psychological health (5,6), and alleviate symptoms of depression and anxiety (7).

In 2010, one in four adults were reported to be physically inactive globally (3). This alarming report had triggered the responsible parties, internationally and locally to take immediate action to prevent further catastrophe in view of strong evidence showing that physical inactivity increases the risk of many adverse health conditions, including major non-communicable diseases (NCDs) such as coronary heart disease, type 2 diabetes, and breast and colon cancers, and shortens life expectancy (8). NCDs kill 38 million people each year and almost half of them die before the age of 70. Four main NCDs that accounts for 82% of all NCDs deaths are cardiovascular diseases, cancers, respiratory diseases and diabetes. Meanwhile in Malaysia, 73% of total deaths were contributed by NCDs as reported in 2015 (9).

The National Health and Morbidity Survey (NHMS) in 2015 reported around 7 million (33.5%) of adults age 18 years and above or 1 in 3 adults in Malaysia were physically inactive (9) which was higher than the WHO

findings. The Malaysian Adult Nutrition Survey (MANS) in 2014 reported that 36.9% Malaysian aged 18 to 59 years old were found to be physically inactive (10). The population spent the majority of their time (74% of the day) in sedentary activities, such as sleeping or lying down (11). These statistics suggest that adult physical inactivity is an important public health concern in Malaysia.

NHMS 2015 reported that the prevalence of physical inactivity in Putrajaya was 32.5%, an estimated 681,920 adults (9). The same study also showed that the government servants (33.9%) were found to be less active as compared to private sector's workers (29.6%), self-employed (23.1%) and unpaid worker/ home maker (33.2%). There are a few studies done among general workers population locally (12,13) but there is lack of previous studies on physical activity among government servants and health staff specifically in Malaysia. Therefore, it is essential to understand the factors influencing physical inactivity especially in local settings to be able to curb this issue effectively. In addition, physical activity participation is influenced by characteristics of the individual, social and the surrounding environment. Thus, this study aimed to measure the prevalence of physical inactivity and identify its associated factors among health staff in a government department in Putrajaya.

METHODS

A cross sectional study was conducted between February 2017 till July 2017. There were five different divisions in the department and the staff was listed according to their respective divisions. The inclusion criteria was current health staff working in the department whereas the exclusion criteria were pregnant and on long leave from work. The sample size for this study was calculated using two proportions formula (14) and the sample required was 310 respondents. The number of participants selected from each division were determined according to the proportion and they were selected based on simple random sampling from each division.

Instrument

A self-administered questionnaire was used to collect information from the respondents including the socio-demographic information i.e. age, gender, ethnicity, marital status, educational status and income status; lifestyle factor i.e. smoking status, occupational status and health status i.e. body mass index (BMI) and chronic diseases status. To determine the level of physical activity, a validated short version of the International Physical Activity Questionnaire (IPAQ) in English (15) and Malay (16) was used. Based on the questionnaire, respondents were categorised into low, moderate and high PA level. Then, they were further classified into active (moderate and high level of PA) and inactive (low PA level) (9).

To assess the physical activity barriers, the questionnaire used was based on several local studies (17,18) which adopted the Likert scale format i.e. score ranging from 5 (strongly agree) to 1 (strongly disagree). The higher the score, the higher the barriers perceived. It consisted of 22 items from three different domains i.e. personal, social environment and physical environment. Personal barriers are the factors determined by every respondent's personal decision regarding participation in physical activity. Social environment barrier are the factors that influence respondent's decision on participation in physical activity. While the physical environment barriers are the factors that is beyond respondent's control regarding physical activity participation.

Back to back translation using English and Malay languages was used to construct the questions in the questionnaire. Face validity was examined from the responses obtained from the health staff who were not part of the study. Content validity for the questionnaire was reviewed by two experts (Public Health Physicians) from Community Health Department at Universiti Putra Malaysia. A pre-test of the questionnaire was conducted among 30 health staff not included in the study. The reliability test showed excellent internal consistency (Cronbach's alpha = 0.92) which is considered as excellent (19).

Statistical Analysis

IBM Statistical Program Social Sciences (SPSS version 22.0) was used to analyse the data. Descriptive analysis included the frequency, percentage, mean (standard deviation) and median (interquartile range). The chi-square test was used to evaluate any association between categorical independent variable and the dependent variable. While the independent t-test (for normal data distribution) or Mann-Whitney U test (for data not normally distributed) were used to look for association between continuous independent variables and the outcome. From the univariate analysis, the independent variables with p value less than 0.25 were selected to be included in the logistic regression. The multiple logistic regression test was used to find the best fitting model to describe the relationship between the selected independent variables and physical inactivity. The predictors then were determined based on the final multiple logistic regression model. The level of significance was set at 0.05 for all the test mentioned unless stated otherwise.

Ethical approval

Study approval was obtained from the Medical Research and Ethics Committee (MREC) of Ministry of Health (MOH), Ethics Committee for Research Involving Human Subjects Universiti Putra Malaysia (JKEUPM) and the Deputy Director General of Health (Public Health) Office. The participants who were selected

and agreed to participate were recruited into the study. Their informed consents were obtained prior to data collection.

RESULTS

Prevalence of physical inactivity

A total of 303 respondents was recruited in this study. Overall, 37.6% (114) of the respondents were found to be physically inactive.

Characteristics of the respondents

The majority of the respondents were female (208, 68.6%), Malay ethnicity (274, 90.4%), aged between 30-39 years (141, 46.5%), married (259, 85.5%), income of RM5,000 and above (142, 46.9%), and had degree and post-graduate holders (166, 54.8%), as listed in Table I. The majority of them also were non-smokers (264, 87.1%), managers & professionals (162, 53.5%), no chronic diseases (231, 76.2%) and normal BMI status (112, 37%) as shown in Table II.

Table I: Distribution of Respondents Based on Socio-Demographic Factors (n=303)

Variable	n	%
Age (years)		
<29	27	8.9
30-39	141	46.5
40-49	80	26.4
≥50	55	18.2
Gender		
Male	95	31.4
Female	208	68.6
Ethnicity		
Malay	274	90.4
Chinese	9	3.0
Indian	13	4.3
Others	7	2.3
Marital Status		
Single	42	13.9
Married	259	85.5
Widow/widower/divorced	2	0.7
Monthly Income (RM)		
<3,000	87	28.7
3,000 – 4,999	74	24.4
5,000 and above	142	46.9
Education		
SPM/STPM	42	13.9
Cert/Diploma	95	31.3
Degree/Post Graduate	166	54.8

Table II: Distribution of Lifestyle, Occupational and Health Status Factors (n=303)

Variable	n	%
Smoking Status		
Current Smoker	6	2.0
Ex-Smoker	33	10.9
Non-Smoker	264	87.1
Occupation		
Management & Professionals	162	53.5
Implementers	141	46.5
Chronic Diseases Status (overall)		
Yes	72	23.8
No	231	76.2
Diabetes Mellitus		
Yes	20	6.6
No	283	93.4
Hypertension		
Yes	31	10.2
No	272	89.8
Hypercholesterolemia		
Yes	44	14.5
No	259	85.5
Cardiovascular Disease		
Yes	3	1.0
No	300	99.0
Asthma		
Yes	25	8.3
No	278	91.7
Other Disease		
Yes	12	4.0
No	291	96.0
BMI Status		
Underweight	5	1.7
Normal	112	37.0
Overweight	103	34.0
Obese	83	27.3

Distribution of physical activity barriers

By combining the "agree" and "strongly agree" answers, the three most common personal barriers were "lack of self-discipline", "causes muscle and joint pain" and "too tired". Meanwhile, "do not have free time" and "do not have company" were the two most common barriers reported for social environment. In addition, "hot weather and rainy days" was the commonest barrier reported for physical environment barrier. The mean score for personal barriers and social environment barriers are shown in Table III.

Table III: Distribution of Physical Activity Barriers (n=303)

Physical Activity Barriers	n (%)	Mean (S.D.)	Median (IQR)
Personal Barriers	243 (80.2)	30.31 (7.66)	
Too tired	68 (22.4)		
Too lazy	66 (21.8)		
Ashamed of self	21 (6.9)		
Don't know correct way	64 (21.1)		
Daily activities are active enough	54 (17.8)		
Afraid of getting injured	60 (19.8)		
Have medical condition	29 (9.6)		
Causes muscle and joint pain	94 (31.0)		
Body shape issue	17 (5.6)		
Fasting	61 (20.1)		
Inconvenience	53 (17.5)		
Boring	25 (8.3)		
Lack of self-discipline	177 (58.4)		
Social Environment Barriers	165 (54.5)	12.18 (3.78)	
No encouragement from family and friends	23 (7.6)		
Do not have free time	109 (36.0)		
Do not have company	93 (30.7)		
Interruptions of work or daily chores	84 (27.7)		
Interferes social or family activities	36 (11.9)		
Physical Environment Barriers	120 (39.6)		8.0 (4)
Have to spend money and it's expensive	35 (11.6)		
Hot weather or rainy days	105 (34.7)		
No facilities or place	32 (10.6)		
Facilities and sports area are too far	33 (10.9)		

Table IV: Association Between Physical Activity Level and Occupational, Lifestyle and Health Status Factors (n=303)

Variables	Physical Activity Level		χ^2	d*f*	*p* value
	Inactive n (%)	Active n (%)			
Age (years)					
<40	67 (39.9)	101 (60.1)	0.819	1	0.366
≥40	47 (34.8)	88 (65.2)			
Gender					
Male	37 (38.9)	58 (61.1)	0.103	1	0.748
Female	77 (37.0)	131 (63.0)			
Ethnicity					
Malay	106 (38.7)	168 (61.3)	1.377	1	0.241
Non-Malay	8 (27.6)	21 (72.4)			
Marital Status					
Not Married	17 (38.6)	27 (61.4)	0.022	1	0.881
Married	97 (37.5)	162 (62.5)			
Monthly Income (RM)					
<3,000	36 (41.4)	51 (58.6)	5.373	2	0.068
3,000 – 4,999	34 (45.9)	40 (54.1)			
5,000 and above	44 (31.0)	98 (69.0)			
Education					
SPM/STPM	15 (35.7)	27 (64.3)	11.931	2	**0.003***
Cert/Diploma	49 (51.6)	46 (48.4)			
Degree/Post Graduate	50 (30.1)	116 (69.9)			

** Significant at p value <0.05*

Association between socio-demographic, lifestyle, occupational, health status and physical activity barriers of the respondents and physical activity level

There was a significant association between education, smoking status, occupation, BMI status, physical activity barriers with level of physical activity as shown in Table IV, V and VI.

Predictors for physical inactivity

As for predictors of physical inactivity that is illustrated in Table VII, smokers were two times more likely to be physically inactive as compared to non-smokers. Meanwhile, those with certificate and diploma qualification were two times more likely to be physically inactive as compared to those with degree and post-graduate education. In addition, for physical activity barriers, with each additional score for personal barriers, the risk increased by 1.106 times for the respondents to be physically inactive. For each extra score of social environment barriers, the chances increased by 1.106 times for the respondents to be physically inactive. Almost 20% of the variance in physical inactivity was explained by this model (Nagelkerke R squared = 0.191).

DISCUSSION

This study reported about one third of the respondents were physically inactive. This figure was slightly higher than the NHMS 2015 that showed a national prevalence of physical inactivity of 33.5%, of which 33.9% of government servants were found to be physically inactive (9).

Table V: Association Between Physical Activity Level and Occupational, Lifestyle and Health Status Factors (n=303)

Variables	Physical Activity Level		χ^2	d*f*	*p* value
	Inactive n (%)	Active n (%)			
Smoking status			6.732	1	**0.009***
Current smoker / Ex-smoker	22 (56.4)	17 (43.6)			
Non-smoker	92 (34.8)	172 (65.2)			
Occupation			11.000	1	**0.001***
Management & Professionals	47 (29.0)	115 (71.0)			
Implementers	67 (47.5)	74 (52.5)			
Chronic Diseases Status (overall)			0.283	1	0.594
Yes	29 (40.3)	43 (59.7)			
No	85 (36.8)	146 (63.2)			
Diabetes Mellitus			0.530	1	0.466
Yes	6 (30.0)	14 (70.0)			
No	108 (38.2)	175 (61.8)			
Hypertension			0.836	1	0.361
Yes	14 (45.2)	17 (54.8)			
No	100 (36.8)	172 (63.2)			
Hyper-cholesterolemia			0.022	1	0.881
Yes	17 (38.6)	27 (61.4)			
No	97 (37.5)	162 (62.5)			
Cardiovascular Diseases			-	-	0.559[a]
Yes	2 (66.7)	1 (33.3)			
No	112 (37.3)	188 (62.7)			
Asthma			0.066	1	0.798
Yes	10 (40)	15 (60)			
No	104 (37.4)	174 (62.6)			
Other Diseases			-	-	0.141[a]
Yes	7 (58.3)	5 (41.7)			
No	107 (36.8)	184 (63.2)			
BMI Status			5.441	1	**0.020***
Obese	40 (48.2)	43 (51.8)			
Non-Obese	74 (33.6)	146 (66.4)			

** Significant at p value <0.05, [a] Fisher's Exact Test*

Table VI: Association Between Physical Activity Barriers and Physical Activity Level (n=303)

Variables	Mean / Mean Rank		t (d*f*) / [a]Mann-Whitney U	Z	*p* value
	Physical Activity Level				
	Inactive	Active			
Physical Activity Barriers					
Personal	33.17	28.58	5.261(301)		**<0.001***
Social Environment	33.17	28.58	4.798(301)		**<0.001***
Physical Environment	171.94	139.97	8499.5[a]	-3.111	**0.002***

** Significant at p value <0.05, [a] Mann-Whitney U test*

Table VII: Multiple Logistic Regression Model Showing Predictors for Physical Inactivity (n=303)

Factors	aOR	S.E.	Wald	*p*	95% CI for	
					Lower	Upper
Education			7.639	0.022		
Degree/Post Graduate	1					
SPM/STPM	1.014	0.386	0.001	0.971	0.476	2.160
Cert/ Diploma	2.135	0.286	7.018	0.008*	1.218	3.743
Smoking Status						
Non-smoker	1					
Smoker/ Ex-smoker	2.308	0.378	4.904	0.027*	1.101	4.840
Physical Activity Barriers						
Personal	1.055	0.022	5.669	0.017*	1.009	1.102
Social Environment	1.106	0.045	5.015	0.025*	1.013	1.208
Constant	0.023	0.623	36.487			

**Significant p value <0.05*
aOR=Adjusted Odds Ratio, CI=Confidence Interval, S.E.: Standard Error

Several significant factors that influence the physical inactivity among the respondents were illustrated in this study i.e level of education, occupational status, smoking status, obesity, personal, social environment and physical environments barriers.

In terms of level of education, those with certificate and diploma were found to be physically inactive compared to those with degree and post-graduate education. This finding is in contrast to other local studies that showed that those with lower education were less likely to be physically inactive (20,21).The plausible explanation for our finding is that those with advanced education engage in more preventive and risk control behaviour which include physical activity (22). Moreover, this study was among health staff, therefore the above outcome would be expected.

Level of education is closely related to occupational status and income level. In this study, even though it is not included in the final model after adjusted for other variables, it was found to be significantly associated with physical inactivity under univariate analysis in which the management and professionals group was reported to be more active when compared to the supporting staff group. This finding is similar with a research done among workers which found that the professionals group were more active compared to the non-professionals group (23). However, several studies reported different results in which the intermediate group such as clerks were more physically active compared to those with high- and low-class occupation (24). A local study showed that the professionals group was reported to be less active compared to the non-professionals (25). The possible reason is because those with higher level of occupational status, would have higher job demands which cause them to be having sedentary lifestyle working in the office as well as working long hours, thus preventing them from finding time to allocate to physical activities. Therefore, based on the study findings, physical activity intervention programs could be focused and tailored to be suitable to those with certificate and diploma education as well as the supporting staff group.

Current smokers and ex-smokers were more likely to be physically inactive as compared to non-smoker in this study. According to a study among adults in Tehran, smokers were five times more likely to have unsatisfactory physical activity as compared to non-smokers (26). The probable reason behind is that those who smoke may have decreased pulmonary function which leads to reduction in the ability to be involved in physical activity (27). Therefore, smoking cessation services should be strengthened to assist smokers to quit smoking in view of being a strong predictor towards physical inactivity. Current evidence shows that lung function can be improved by quitting smoking (28).

Both obese and overweight workers (either male or female) have almost one and half to two times higher chance of being physical inactive as opposed to those with ideal weight (23). This is not surprising as not only obesity and overweight can increase the odds of being physically inactive, but being physically inactive could add to being overweight and obese (29). There was also a report stating that dopamine receptor is decreased in obese individuals, which is responsible in modulating motivation and reward circuits (30). This decrease could negatively impact their reward value and perceived cost/benefits of certain activities such as physical activity. Under univariate analysis, this study found that being obese has a higher possibility of being physically inactive, similar to several other studies (12,31). However, it was not one of the predictor in the final model after adjustment for other variables.

This study found significant association between personal, social environment and physical environment with physical activity level. In other words, the more barriers a person has, the physical activity participation will decrease. Many local and international studies supported this finding (13,32,33). Lack of self-discipline and do not have free time to do physical activity were the most common barriers reported in this study. Poor social support from family or friends could influence a person to be more physically inactive than those with good support (34). Moreover, individuals from low socioeconomic groups were less likely to be active as compared to those with high economic status due to these social and environmental barriers (35).

In view of these barriers, employers could provide more structured intervention programs with specific time allocation for physical activity. In order to address "do not have company to do physical activity" barrier, physical activity should be done with a partner or in a group. Evidence showed that with a partner, physical activity performance can be improved and be more sustainable (36). Support groups could also be formed to motivate and encourage the physical activity participation.

Since it was a cross-sectional study, the causal relationship could not be determined as the outcome and contributing factors were measured at the same time. Self-administered questionnaire, which was used in this study, could lead to recall bias. In addition, no confirmatory tests were done to verify the status of chronic diseases in view of budget constraints and time limitation. Again, due to time constraints, short IPAQ was used in this study, which could not differentiate the type of physical activity among the respondents. Besides, utilisation of wearable technology in future study like pedometer could provide more objective result in measuring physical activity. As this study only involves one department, it cannot represent the other health staff and government servants. In future, a wider scope of population with exploration on factors not included in this study could be adopted to obtain a more

comprehensive understanding on the subject matter.

CONCLUSION

The results from this study provides evidence-based information related to the level of physical inactivity and the factors that could influence such behaviour among the health staff particularly in the government sector. The information pertaining to predicting factors i.e. certificate/diploma education level, smokers/ex-smokers, personal barriers and social environment barriers for physical inactivity should be scrutinised by the employers to assist in developing programs to promote physical activity at workplaces.

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