ORIGINAL ARTICLE

Factors Influencing Physical Activity Level Among Secondary School Adolescents in Petaling District, Selangor

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SUMMARY

Physical activity is the first line approach and one of the main factors in preventing chronic diseases. Currently there is the increasing percentage of sedentary life style or lack of exercise among adolescents. The main objectives of the study were to determine the prevalence of inactivity and the factors influencing physical activity in adolescents. A cross sectional study was carried out among secondary school students aged 14 and 16 in Petaling District, Selangor, Malaysia. A total of 519 respondents participated in this study. Their physical activity level was measured using the International Physical Activity Questionnaire (IPAQ). The active group was classified as those having levels of equal or more than 600 met-min per week while less than 600 met-min per week was considered inactive. Response rate in this study was 95.4%. The prevalence of inactive in adolescents was 20.8%. Female adolescents, non-working mother, time constraint, exercise only when having ample time and stretching before exercise are predictor factors for being inactive among adolescents. Steps need to be taken to persistently ensure that the physical activity among adolescents be increased continuously.

KEY WORDS:
Physical activity, Adolescents, IPAQ

INTRODUCTION

Physical activity remains the most important modifiable risk factors in preventing many diseases, especially of chronic origin. The development of technology and modernization leads to sedentary life style with accompanying physical inactivity. This pattern of sedentary behaviour is not only prominent in adult population, it follows a similar trail in children and adolescents especially those living in the urban region. Physical activity is important since it is the first line of prevention especially at a very early age to prevent chronic diseases in adulthood[1]. To be able to encourage children and adolescents to participate actively in physical activity, it is crucial to find out factors that influence physical activity in this particular group.

According to the National Centre for Chronic Disease Prevention and Health Promotion[2], young Malaysians are inactive, unfit and overweight. This has threatened the long effort of restoring good health to the population especially in the fighting of cardiovascular diseases. Among diseases related to physical inactivity are cardiovascular disease, chronic diseases such as hypertension and diabetes, overweight and obesity, psychiatric problems such as depression and anxiety, and colon cancer[2]. This is an important point to consider as the prevention of the diseases mentioned lies in the effectiveness of healthy lifestyle promotion especially on the adolescent.

The improvement in the adolescent healthy behaviours such as balanced diet and physical exercise will lead to a reduction in the risk of developing chronic diseases later in life. Therefore, the solution lies in primary prevention and promotion in children and adolescents.

The objectives of this study were to determine the prevalence and level of physical activity as well as to determine the factors influencing physical activity in adolescents.

MATERIALS AND METHODS

The study was conducted in Petaling District in Selangor. Petaling is the smallest district in Selangor but with the highest population density. The schools were selected using simple random sampling and six out of 54 schools were involved in the study. The study was carried out from June to November 2007 and it was a cross sectional study. The study involved only fourteen and sixteen year old secondary school students. A total of 519 respondents participated in this study.

Data collection was based on questionnaire which consisted of multiple sections with regards to demographic data, physical activity level in a week, personal barriers to physical activity, family and friends support, knowledge and attitude to physical activity and environmental factors affecting physical activity. The questionnaire was adapted from the Ministry of Health Malaysia Healthy Lifestyle Campaign surveys among primary school children in Malaysia[3].

Permission to do the study was obtained from the Ministry of Education Malaysia as well as State Education Department of Selangor. The Petaling District Education Office was informed and permissions were granted by the respective schools' principal. Consent forms were also given out to parents prior to the questionnaire and only those respondents with consent from parents were allowed to participate in the study.

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The dependent variable was the physical activity level among the respondents. This was measured by using International Physical Activity Questionnaire (IPAQ) in which a respondent with the cut off point of less than 600 met-min per week was considered to be inactive[4,5]. Metabolic equivalent (met) is defined as the number of calories consumed by an organism per minute in an activity relative to the Basal Metabolic Rate (BMR). A single unit (1 met) is the caloric consumption of that organism, or individual, while at complete rest. Those achieving 600 met-min per week or more are considered to be active[4,5].

The independent variables were socio-demographic factors that include gender, parental employment and parental income, mode of transportation to school and type of housing; personal barriers to physical activity such as time constraint, unavailability of equipment, lack of knowledge on equipment usage, feeling of embarrassment, lazy to exercise and weather factors, family and friend support as well as respondents habits that influence physical activity; knowledge and attitude towards physical activity and environmental factors such as distance of facility from home, noise, safety, equipment, fees were included.

The data was analysed with SPSS Version 13.0 software. Descriptive analysis was presented in terms of frequency, percentage and median. Bivariate analysis and logistic regression were also carried out.

RESULTS

Descriptive Analysis

The study was conducted at six selected schools at Petaling District. There were a total of 519 respondents eligible for the study and more Form 4 students (52.5%) participated than form 2 students (47.4%). There was a 95.4 percent response rate. This study found that prevalence of inactive was 20.8% and prevalence of active was 79.2%. (Table I)

A total of 63.4% were girls and the other 36.6% boys. Majority are Malays (64.7%) while the rest comprise mainly of Chinese (19.5%) and Indian (14.6%). Most of the respondents' fathers were employed (94.0%) while most mothers were not (64.0%). The level of income of parents was mainly in the lower class category which is less than RM1500. Fathers' income of the lower class category is 41.6% while for mothers it was 80.9%. Most respondents were using motorized vehicle to school (63.8%) as compared to those who walk or cycle.

Most items in the personal factor were found to be factors that inhibited respondents from participating in physical activity. A total of 65.9% (342) respondents claimed facing personal barriers. The percentage of personal barriers were 'hot weather leads to feeling of uncomfortable in doing physical activity'(41.8%), 'no companion to do physical activity'(41.3%), 'time constraint to exercise'(34.9%), 'not having the skills to participate in physical activity'(34.3%), 'lazy'(32.8%), 'equipment and facility not available' (30.8%) and 'too tired' (23.3%). The other barriers were 'not interested' (19.5%), 'difficult to exercise'(15.4%), 'embarrassed'(15.4%), 'felt that they are fat and prevent them from being active'(9.8%), 'afraid of injuring themselves during physical activity' (9.4%) and 'medical problems'(7.1%).

A small number of respondents claimed that they prefer to do physical activity with their family (11.9%) while more prefer to do physical activity with their friends (32.6%). Majority of the respondents claimed that they help out in doing housework (81.5%) and more than half (59.9%) claimed they prefer to do indoor activities like watching television and playing computer games.

In terms of family support, respondents claimed that their family were not active physically (38.3%), family too busy to be involved in physical activity (43.4%) and not supportive in physical activity (17.7%).

Analysis on knowledge and attitude showed more than half (63.9%) of the respondents responded correctly to the statements on physical activity. A total of 92.3% agreed physical activity improved blood circulation and contributed to a healthy heart. Physical activity was felt to be able to decrease body weight (95.4%) and relieved stress (80.9%).

The environmental factors studied were safety, distance from home, available jogging track, air and noise quality, cleanliness and space of the facility. A total of 25% of the respondents claimed to have problems related to environmental factors. The percentage of environmental factors were 'the air quality is not healthy' (41.4%), 'the recreation area far from house' (41.4%) and 'the jogging track is not safe' (38.5%).

Bivariate and Multivariate Analysis

Gender, race and mother unemployment were factors from socio-demographic and socio-economy that differ significantly between the active and inactive group ($p<0.05$) (Table II). There were also significant differences between active and inactive group with regards to personal and environmental factors (Table III). Assessing the family and knowledge factors, demonstrated that 'family do not exercise', 'exercise reduce stress', 'exercise improve academic performance' and 'stretching is important before exercise' had significant association with physical activity (Table IV).

Logistic regression analysis found females were 2.2 times more likely to be inactive than males (OR=2.176, CI=1.225-3.866) and those respondents with unemployed mothers were 2.2 times more likely to be inactive compared to those with employed mother (OR=2.167, CI=1.263-3.717). Time constraint was associated with inactivity where those who reported time constraint in doing physical activity were 2.5 times more at risk to become inactive (OR=2.473, CI=1.335-3.717). Those who reported 'prefer to do exercise when time is available' were 2.5 times more likely to be inactive (OR=2.482, CI=1.413-4.360) and those who reported 'stretching is necessary before exercise' were 3.7 times more likely to be inactive (OR=3.746, CI=1.540-9.118) (Table V).

Table I: The Level of Physical Activity measured using IPAQ

Level of Physical Activity According to IPAQ		Numbers (n) N = 519	%
Level of Activity (Modified Categories)			
Inactive	< 600 mets-min/week	108	20.8
Active	≥ 600 mets-min/week	411	79.2

Table II: Association between Physical Activity and Socio Demographic Factors

Characteristics	Level of Physical Activity		χ^2	P value
	Inactive N (%) (n=108)	Active N (%) (n=411)		
Race				
Malay	58 (17.3)	278 (82.7)	7.277	0.007
Others	50 (27.3)	133 (72.7)		
Gender				
Male	24 (12.6)	166 (87.4)	12.163	<0.0001
Female	84 (25.5)	245 (74.5)		
Mother Employment				
Working	26 (13.9)	161 (86.1)	8.459	0.004
Not working	82 (24.7)	250 (75.3)		

P<0.05 statistically significant

Table III: Association between Physical Activity and Personal factor and Environmental factor

Characteristics	Level of Physical Activity		χ^2	P value
	Inactive N (%) (n=80)	Active N (%) (n=262)		
Exercise when having ample time				
Yes	68(16.4)	347(83.6)	24.594	<0.0001
No	40(38.5	64(61.5)		
No skills				
Yes	48 (27.3)	128(72.7)	3.048	0.081
No	32(19.3)	134(80.7)		
Prefer to watch TV				
Yes	77 (24.9)	232 (75.1)	7.828	0.005
No	3(9.1)	30(90.9)		
Embarresed				
Yes	24 (30.0)	56 (70.0)	4.848	0.028
No	56(21.4)	206(78.6)		
Lazy				
Yes	52 (30.6)	118 (69.4)	14.671	<0.0001
No	28(16.2)	144(83.8)		
Too trouble some				
Yes	26(32.5)	54(67.5)	7.844	0.005
No	54(20.6)	208(79.4)		
Hot weather				
Yes	55(25.3)	162(74.7)	4.657	0.031
No	25(20.0)	100(80.0)		
Equipment not available				
Yes	43(26.9)	117(73.1)	5.165	0.023
No	37(20.7)	145(79.3)		
Facility far from home				
Yes	55 (25.6)	160 (74.4)	4.987	0.026
No	25(19.7)	102 (80.3)		

P<0.05 statistically significant

Table IV: Association between Physical Activity and Family and Knowledge factors

Independent Variables	Level of Physical Activity		χ^2	P value
	Inactive N = 108(%)	Active N = 411(%)		
Family do not exercise				
Yes	54 (27.1)	145 (72.9)	7.839	0.005
No	54 (16.9)	266 (83.1)		
Exercise reduce stress				
Yes	79 (18.8)	341 (81.2)	6.851	0.032
No	29 (29.3)	70 (70.7)		
Exercise improve academic performance				
Yes	67 (18.2)	301 (81.8)	5.200	0.023
No	41 (27.2)	110 (72.8)		
Stretching is important before exercise				
Yes	94 (19.2)	395 (80.8)	12.919	0.0001
No	14 (46.7)	16(53.3)		

P<0.05 statistically significant

Table V: Predictors of Inactive (Physical Activity) among adolescents

Variables	Regression Coefficient ß	Standard Deviation	P value	Adjusted Odd Ratio	95% CI
1. Gender					
[male]*					
female	0.778	0.293	0.008*	2.176	1.225 – 3.866
2. Mother Employment					
[working]*					
not working	0.773	0.275	0.005*	2.167	1.263 – 3.717
3. Time constraint					
[No]*					
Yes	0.905	0.314	0.004*	2.473	1.335 – 4.579
4. Exercise having ample time					
[Yes]*					
No	0.909	0.287	0.002*	2.482	1.413 – 4.360
5. Stretching is important before exercise					
[Yes]*					
No	1.321	0.454	0.004*	3.747	1.540 – 9.118

P<0.05 statistically significant
* [ ] reference category

DISCUSSION

This study attempts to explain the factors associated with physical activity in adolescents. The respondents in this study were mainly Malay females and majority was aged 16 years. Factors such as socioeconomic factors, personal barriers, family and peers support, knowledge and attitude as well as environmental factors play an important role in influencing physical activity level among adolescents[6]. Majority of the respondents in the study were active and a similar finding was observed from research conducted by the Ministry of Health[7].

Although bivariate analysis showed that female adolescents were more active as compared to male adolescents, logistic regression showed otherwise. This was probably due to the fact that there were more female than male respondents in the study. Logistic regression eliminates this difference resulting in the true effect of the study. In the present study, males were more active than females. A study on adolescents aged 8 to 13 years showed male adolescents had higher physical activity level than female adolescents[6]. The fact that male adolescents were more active than female adolescents is supported by many studies[8,9,10,11]. However there was a reduction in physical activity in both males and females as they aged[12]. This finding was shared by other studies[13,14,15] .

Adolescents having unemployed mothers were more likely to be inactive than those having employed mothers[16]. This study showed that adolescents of unemployed mothers were 2.1 times more likely to be inactive as compared to adolescents with employed mothers. This was supported by a study where family support, intimacy and involvement in physical activity were important predictor factors of physical inactivity in adolescents[17] .

Burden of homework, housework, tuition and other activities occupied most time and left limited time for adolescents to be involved in physical activity. Many studies have shown that time constraint was one of the reasons for adolescents to avoid physical activity[18,19,20,21,22]. Therefore adolescents should be encouraged to manage their time to be involved in physical activity[21].

Knowledge regarding exercise and physical activities were important factors to create awareness among adolescents. In the present study the statement 'stretching is important before exercise' differs significantly between the active and inactive group. The majority of adolescents in the present study were aware that exercise was good for the heart, reduced weight and relieved stress. Stretching and warming up prior to exercise is very important and beneficial to allow the muscle to be more flexible during physical activity[23].

CONCLUSION

Physical activity among adolescents is becoming one of the more important issues in public health. The fact that many of the factors that influence physical activity among adolescents are modifiable factors, it is important that these factors be identified and dealt with early in life. This study found that majority of the respondents were active. Female adolescents, non-working mother, time constraint, exercise only when having ample time and stretching before exercise were factors favouring being inactive among adolescents. Proactive measures are helpful in identifying more factors that influence physical activity and to increase physical activity to the benefit of the adolescents.

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