Psychosocial Factors Associated with Physical Activity Level Among Undergraduate Students in a Public University in Malaysia

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Abstract

This cross-sectional study aimed to determine the association of psychosocial factors with physical activity levels among undergraduate students aged 18 to 30 years. A sample of 261 students from Universiti Putra Malaysia (n = 261; 138 males; 123 females) participated in the study. The respondents have been selected through a probability-based cluster sampling. A self-administered questionnaire was used to gather information regarding the socio-demographic characteristics(age, ethnicity, family household number, allowance income, and parent's monthly income), psychosocial factors (self-efficacy, social support, and perceived benefit), and physical activity levels, which was accessed using Global Physical Activity Questionnaire (GPAQ). Multiple linear regression analysis was performed to determine factors associated with physical activity levels. The highest percentage of respondents (63.2%) were classified as having a moderate physical activity, followed by vigorous (24.9%)and low physical activity (11.9%). The findings of multiple linear regression revealed that self-efficacy (Beta = 0.137, p = 0.049) and physical performance (Beta = 0.193, p = 0.002) were significant predictors of physical activity levels. Therefore, enhancements in self-efficacy and positive perception toward having better physical performance could be used as a strategy to increase physical activity levels among students in the university.

Keywords:*Physical activity; Psychosocial, Self-efficacy; Social support; Perceived benefit.*

1. Introduction

Physical activity (PA) is defined as "any bodily movement that involves skeletal muscle contraction which causesenergy expenditure"[1]. A global statistic by the World Health Organization reported that the prevalence of insufficient physical activity was 23% for men and 32 % for women aged above 18 years[2]. The World Health Organization (2012) also found that Malaysia is among the countries with the highest level (61.5%) of physical inactivity among people aged 15 and over [3].

Physical activity is an integral part of preventing diseases. Recent studies have reported thatthere was a positive association of consistent PA with both physical and psychological wellness[4].Therelationships of PA levels with the reduced risk of certain chronic diseases, such as type 2 diabetes mellitus, coronary heart disease, hypertension, colon tumors, and osteoporosis have been demonstrated previously[5].

Physical activity and fitness should stay on top of the priority of any country as prevention strategies to combat chronic diseases[6]. As part of that, the Malaysian Ministry of Health launched the Healthy Lifestyle Campaigninearly 1991.Itemphasizesfour main elements of a healthy and wholesome lifestyle: healthy eating, exercise and PA, smoking avoidance, and stress management[7]. TheMalaysian Dietary Guidelines have recommendedat least 30 min of moderate-intensity PA daily for at least five days each week for adults[8]. A cross-sectional study among university students reported that the level of physical activity gradually decreased from high school to college[9].Asurvey conducted on physical activityamongMalaysian youth residing in the KlangValleyshowed that the prevalence of physical activity was higheramong respondentsaged 21 years as compared to the other ages, but the prevalence was loweramong those aged22 years and older[10].

A surveyby Cheah and Poh[11] among adults in Malaysia found that socio-demographic characteristics such as age, gender, marital status, ethnicity and socioeconomic status including educational levels and household income, as well as psychosocial factors such as self-efficacy and perceived health status benefits, could influence a person's choice to take an interest and participate in physical activity.There are many determinants of PA, and among these determinants, the most documented is the relationship with biological and demographic variables[12]. Age and gender are certainly among the strongest demographic correlate with PA behavior among adults [12].A previous study has reported men generally tend to be more active than women[13]. The probability of being inactive augmented with increasing age[14].

To date, most research investigated the factors associated withPA focused among high-income countries especially in Western nations [15]. A study by Humphreys and Ruseski, [16-17], who examine the factors affecting physical activity participation in the USA and Canada. Their results indicate that the likelihood of participating in physical activity increases with income, but the time spent decreases with income, which means that the income affected physical activity positively.

A previousstudy observed that self-efficacy, which is the belief of an individual in his/her capability to be physically activeon a daily basis, coupled with perceived benefits (such as health, appearance, social, competition, and pleasure) and obstructions (such as lack of interest/time, health-related problems, and psychological problems), were found to have a significant associations with PA behavior among Portuguese and Belgian adults[18]. It was reported that social support from peers, friends, relatives, and family in an organized setting could positively influence PA behavior[19]. This influence could either be direct, such as doing activities together with friends or peers in a group, or taking care of kids for a partner to exercise, whereas, indirect influence could be demonstrated through inspiration from a relative, friends or idols to become more active[20].

White, Wójcicki,and McAuley[21]conducted a studyamong321older adults and middle-aged subjects for18 months, their findingsindicated that social support could greatly influence PA participation of the subjects. Furthermore, a study in the United Kingdom among female university students reported a positive association between perceived benefits and PA[22]. A study in Malaysia bySiti Affira, Mohd Nasir, Hazizi,and Kandiah[23]found a positive correlation of perceived benefits towards PA among working women in Malaysia.Therefore, the objective of this study is to determine the relationship between psychosocial factors and physical activity levels among undergraduate students in a public university in Malaysia. The findings of the present study were aimed to provide more in-depth understandings of the factors associated with physical activity.

Involvement in PA at the adolescent age contributes to better PA habits in adult life and may significantly influence the long-term health outcomes [24]. Hence, a university is an ideal location for the promotion of PA and other healthy lifestyle activities since there were many students in their early

adulthood [24]. Understanding the factors that leads to decrease of PA in adults is essential for improving effective programs along with the strategies to enhance PA engagement in the number of this population.

2. Methods

Study design and subjects

This is a cross-sectional study to investigate the association of psychosocial factors and PA among undergraduate students in a public university in Malaysia. The inclusion criteria wereundergraduate students of Universiti Putra Malaysia (UPM)aged 18-30 years old. Participants with physical disabilities, pregnant women, and postgraduate students were excluded from this study.

Sampling strategy

Undergraduates student'sUniversiti Putra Malaysia (aged from 18-30 years old) were recruited in this study through probability-based on cluster sampling. Each faculty served as a cluster. The purpose of choosing this method is due to the large population spread overa vast geographic region. The sampling frame comprised of fifteen faculties that offerundergraduate courses in Universiti Putra Malaysia. From the list, one faculty was randomly selected, hence, a cluster was chosen through the use of a random number table, of which, the Faculty of Design and Architect was selected for the study location. Five hundred and three students were invited to participate in this study. Multistage random sampling was then applied in the faculty to recruit261 students, which was the minimum sample size. The selection process began witha random selection of87students from everythree departments namely, Design and Architect Department, Landscape Department, and Industrial Design Department.

3.Measures

Data collection was carried out from September to October, 2018. The questionnaire was designed in English language. First, the students were given detailed information about this study. Subjects who agreed to participate in this study were required to complete and sign the consent form. A set of self-administered questionnaires were completed by the students for the socio-demographic factors, PA levels, and psychosocial variables.

3.1 Socio-demographic characteristics: The participants responded to questions that elicitedsocio-demographic data, e.g.age, ethnicity, family household number, allowance income, and parent's monthly income.

3.2 Physical activity: The participants' PA levelswere assessedusing the Global Physical Activity Questionnaire (GPAQ)[25]. Data were collected based on the frequency ("usual/typical" days), duration (minutes/hours), and levels (moderate/vigorous) of PA in 3areas:inleisure, at work, and in transit. The GPAQ comprises16 questions, including one itemabout sedentary behavior.The standard GPAQ scoring protocol was used to calculate the physical activity level.Details of information on scoring protocol were described by World Health Organization elsewhere [25]. Total physical activity was calculated by the sum of the total metabolic equivalents (MET) minutes of the activity calculated for each domain. To calculate categorical indicators, the number of days, intensity of physical activity and the total time spent in physical activity during a typical week are taken into consideration. Participants were divided into 3 groups namely; Inactive, Moderate, and Highly Active based on the total score of physical activity: MET-minutes per week = (the computed sum of the total MET-minutes per week for each domain). Below are the details criteria for categorizing these groupings:

Highly active

An individual is classified as highly active when any of the following criteria is reached: vigorous-intensity activity on at least 3 days achieving a minimum of at least 1,500 MET-minutes per week OR 7 or more days of any combination of walking, moderate- or vigorous intensity activities achieving a minimum of at least 3,000 MET-minutes per week.

Moderately active

An individual that doesn't meet the criteria for the "Highly active" category, but having mate any of the following criteria is classified in this category: 3 or more days of vigorous-intensity activity of at least 20 minutes per day OR 5 or more days of moderate-intensity activity or walking of at least 30 minutes per day OR 5 or more days of any combination of walking, moderateor vigorous- intensity activities achieving a minimum of at least 600 MET-minutes per week.

Inactive

This category represents those individuals that do not meet any of the above-mentioned criteria.

3.3 Psychosocial Variables

The psychosocial measures in this study focused on self-efficacy, social support, and perceived benefit, which the details were below:

1) **Self-efficacy:**Self-efficacy was assessed using eight items Likert scale using the Physical Activity Self-Efficacy Scale (PASES). The students were askedhow effective they are in doing physical activities [26, 27, 28, 29]. The items of PASES were scored on a 4-point Likert scale from 0-points for strongly disagree to 3-points for strongly agree. The minimum score for self-efficacy to PA is 8 while the maximum score is 31. The median score 22 was used to classify the respondents into two groups, those with high self-efficacy (scores ≥ 22), and those with low self-efficacy (scores < 22). The PASES is a validated instrument [30] in assessing self-efficacy towards physical activity.Cronbach's alpha value for this instrument was 0.82.

2) **Social support:**Social support from family and friends for engaging in PA was assessed by 8 items (6 on positive support, and 2 on negative support) for social support from family and 8 items for friend's social support. Thus, there were 16 items in total to examine friends and family support. The score for family and friends support were ranged from 16 to 80, where higher scores portray more family andfriends support.The questionnairewas adapted from Sallis et al.[20] and 0.90 was the value for the Cronbach's alpha recorded for this instrument.

3) **Perceived benefit:** The "Exercise Benefits Scale" which was developed by Sechrist[31] was employed for measuring the perceived benefits of PA. This scale contains 29 itemson the perceived benefits of PA. The level of agreement was indicated based on a 4-point Likert scale, from 1-point for strongly disagree to 4-points for strongly agree. The scoring was done through a summation of the subscales to generate an overall score for each scale. The possible range of the perceived was from 29 to 116. A better perception is indicated by a higher score. Cronbach's alpha value for perceived benefit was 0.95.

4. Ethical Approval

Ethical approval was granted by the Ethics Committee for Research Involving Human SubjectsUniversiti Putra Malaysia(Reference No: JKEUPM-2018-075) beforedata collection. Permission for the conduct of this study involving the targeted subjects was obtained from the Faculty of Design and Architecture. Written informed consent was obtained from all subjects, and they were enlightened and informed about the purpose of the present study.

5. Statistical analysis

Data wereanalyzedusing IBM-SPSS Statistics Version 25.0 of Windows software (IBM New York, United State). Descriptive statistics, including frequencies and percentages, were used to describe the participants' socio-demographic characteristics. The correlation of the continuous variables wasdetermined through Spearman's rank correlationcoefficientsince the assumptions of normality and linearity were not met.Regression analysis was performedto seek relationships between the dependent variable and one or more independent variables.The histogram (mostly skewed), normal Q-Q plot (the dots were not along and close to the line), and box plot the horizontal line not placed at the center (not

symmetrical), all these shows that the data were not normally distributed. P< 0.05 was considered statistically significant.

6. Results

Table 1 presents the respondent's socio-demographic characteristics and psychosocial factors. The majority of the respondents were male (52%), Malay (57.1%), aged 20–24 years (74.3%), and from households with 4–6 family members (63.2%). More than half of the students (59.8%) had allowance incomes of less than RM500 (the first category). The percentage of parents' monthly incomes were almost similar in all groups as follows: 33.3% were ≤ RM4,000, 34.9% were RM4,000–8,000; and 31.8% were >RM8,000.

Table 1. Socio-Demographic Characteristics and Psychosocial Factors of the Respondents

Variables	Male n=138 n (%)	Female n=123 n (%)	Total=261 n (%)
Gender	138(52.9)	123(47.1)	261(100)
Age, year			
<20	8 (5.8)	15 (12.2)	23 (8.8)
20-24	105 (76.1)	89 (72.4)	194 (74.3)
>24	25 (18.1)	19 (15.4)	44 (16.9)
Ethnicity			
Malay	69 (50)	80 (65)	149 (57.1)
Chines	40 (29)	22 (17.9)	62 (23.8)
Indian	12 (8.7)	5 (4.1)	17 (6.5)
Others	17 (12.3)	16 (13)	33 (12.6)
Family household number			
≤ 3	8 (5.8)	9 (7.3)	17 (6.5)
4-6	88 (63.8)	77 (62.6)	165 (63.2)
>6	42 (30.4)	37 (30.1)	79 (30.3)
Subject allowance income			
< RM 500	85 (61.6)	71 (57.7)	156 (59.8)
RM 500- RM 999.9	28 (20.3)	31 (25.2)	59 (22.6)
RM 1000- RM 1500	23 (16.7)	15 (12.2)	38 (14.6)
> RM 1500	2 (1.4)	6 (4.9)	8 (3.1)
Parent's monthly income			
≤ RM 4000	47 (34)	40 (32.5)	87(33.3)
RM 4000 - 8000	51 (37)	40 (32.5)	91(34.9)
> RM 8000	40 (29)	43 (35)	83(31.8)
Total self-efficacy, Median (IQR)	13.5 (5.00)	14.00(5.00)	14.00(1.00)
Self-efficacy categories, n (%)			
Low	8 (5.8)	11 (8.9)	19 (7.3)
High	130 (94.2)	112 (91.1)	242 (92.7)

Perceived benefit categories, Median (IQR)			
Psychological Outlook	3.33 (0.71)	3.33 (0.67)	3.33 (0.67)
Social Interaction	3.12 (0.75)	3.00 (0.75)	3.00 (0.75)
Preventive Health	3.33 (0.67)	3.00 (0.67)	3.33 (0.67)
Life Enhancement	3.12 (0.53)	3.25 (0.75)	3.12 (0.75)
Physical performance	3.37 (0.75)	3.37 (0.75)	3.37 (0.75)
Total family members support, Median (IQR)	2.25(1.13)	2.62 (1.25)	2.37(1.13)
Family members support categories, n (%)			
Low	43 (31.2)	32 (26.0)	75 (28.7)
Moderate	68 (49.3)	58 (47.2)	126 (48.3)
High	27 (19.6)	33 (26.8)	60 (23.0)
Total friend support, Median (IQR)	2.87 (1.00)	2.75 (1.00)	2.75(1.00)
Friend support categories, n (%)			
Low	15 (10.9)	15 (12.2)	30 (11.5)
Moderate	72 (52.2)	67 (54.5)	139 (53.3)
High	51 (37.0)	41 (33.3)	92 (35.2)
Physical activity level, Median (IQR)	1934 (2113)	1700 (1924)	1880 (2014)
Low, n (%)	15 (10.9)	16 (13)	31 (11.9)
Moderate, n (%)	85 (61.6)	80 (65)	165 (63.2)
High, n (%)	38 (27.5)	27 (22)	65 (24.9)

Based on the self-efficacy scores, the majority had scored above eight (n=242, 92.7%), which were considered as having high self-efficacy, whereas another 7.3% were considered having low self-efficacy. Among the perceived benefits subscales, the highest scores were physical performance subscale (3.37 ± 0.40). Most of the study respondents received moderate social support from the family (48.3%) and friends (53.3%) as presented in Table 1.

The majority of participants (61.6 % male and 65% of females) engaged in moderate physical activity. Nevertheless, male and female respondents were found to practice similar daily physical activities. Overall, most of the activities done by the study populations were at a moderate level (n=165, 63.2%) followed by high PA (n=65, 24.9%), and low PA levels (n=31, 11.9%).

Table 2 revealed the results of the Pearson correlation analyses and the correlation coefficients among subject allowance income, friend support, self-efficacy, psychological outlook perceived benefits, social interaction perceived benefits and physical performance perceived benefits of the participants were found to be positively significant. Our results have indicated the values of thecorrelation coefficients that are significant were within the range of r = .131 and r = .184 at p < .01 and p < .05 respectively. The correlation between physical activity and friend support was found to be the lowest, whereas the correlation between physical activity and subject allowance income was the highest.

Table 2. Spearman's Rho Correlation Between Physical Activity and Variables

Characteristics	Rs
Age, year	.058
Subject allowance income per month, RM	.184**
Family household number	.007
Family support	.091
Friend support	.131*
Self- efficacy	.178**
Psychological Outlook perceived benefits	.170**
Social Interaction perceived benefits	.133*
Preventive Health perceived benefits	.016
Life Enhancement perceived benefits	.105
Physical performance perceived benefits	.170**

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).

Table 3. presents the results of the multiple linear regression that was performed to determine the type of psychosocial factors that could be considered as predictors of PA levels. For the adjusted R^2, only 7% of the variance in physical activity can be explained by self-efficacy, and physical performance perceived benefit. The results from the analysis also showed self-efficacy ($B = 0.137$, $p = 0.04$),and physical performance perceived benefit ($B= 0.193$, $p = 0.002$) contributed significantly toward PA at 0.05 level of significance.

Table 3. Summary of Multiple Linear Regression for physical activity level

Variables	Standardized coefficient Beta	t	P- value
Self-efficacy	.137	1.97	.049
Physical performance	.193	3.08	.002
Perceived benefits			

R²=0.088, Adjusted R²=0.074, F (6.205), p=0.001

7. Discussion

In this study, more than half of the respondents were classified as moderately active, followed by high-active, and low-active. This shows that the majority of the respondents have a satisfying level of physical activity. The National Health and Morbidity Survey (2015) reported that the overall prevalence of physically active adults was 66.5%, of which, a higher percentage of males (71.1%) than females (61.7%). Specifically, around 68% of young adults or adolescents were physically active, but higher a proportions were shown among older adults, of which, 70-73% of adults aged 35-54 were physically active[32]. The results of the present study were supported by a study amongthe universitystudents aged 18-25 years ofseven faculties at university Putra Malaysia, which found that47.7% males and 66.9% of females were classified asmoderately active,while 22.1% and 21.7% wereclassified as low and high levels of physical activityrespectively [32].

The present study reported a large number of respondents exhibited high self-efficacy towards physical exercise. Thisisconsistent with another study among the same university study population, Universiti Putra Malaysia, which reported a high proportion of the participants had high self-efficacy toward PA [33].According to psychologist Albert Bandura, when a person assessing their confidence in the engagement of a given behavior as they are facing the conditions that act as barriers or facilitators, it could be reflected as self-efficacy [35].

This study indicates that there was a significant positive correlation between self-efficacy and PA levels demonstrating the PA self-efficacy increased along with the increase in physical activity behavior. It is acknowledged that university students can easily access information on a healthy lifestyle, which could improve their confidence in taking part in PA [35].Individual efficacy and their belief in perceived benefits in doing a task have been demonstrated as a significant predictor of exercise and other health outcomes [36]. Moreover, self-efficacy and perceived benefit are part of the substantial factors that predict PA [37].In the present study, self-efficacy for being physically active was higher among undergraduate studentsamong Malaysian undergraduate university students. This is in agreement with the earlier report by Chiu [38] who found that self-efficacy was among the strong predictors of physical activity. Consistently, Lasheras, Aznar, Merino & López [39]further established that self-efficacy was considered avital predictor of PA.

Perceived benefits of particular activity of behavior will motivate a person to perform or maintain PA because they expect a good outcome or get benefits from it[40]. The findings of the present study found that most of the students believed in the contribution of physical activity to physiological outlook perceived benefits, as well as enhances physical performance. They also believed that regular PA could increase their social network. Siti Affira, Mohd Nasir, Hazizi, and Kandiah [23]also found that perceived benefits were positively associated with PA levels.

The present study found that the physical performance perceived benefitsignificantly predicted PA. Astudy among undergraduate students supporting our finding, as they reported that men were more

concerned with body size, strength, and power while, women were much interested in controlling, maintaining, or having a lower body weight to have a slim figure, which perceived as an ideal thin body shape [41].Furthermore, astudy by Abdullah has reported that physical performance perceived benefit was the strongest perceived benefit from exercise, followed by psychological outlook and preventive health, life enhancement, and social interaction [42].

For the subject's allowance income, some investigators found that persons from high-income families may be more physically active compared to those from low-income families[39]. In this study, the subject's allowance income per month showed a significant positive association with physical activity. An explanation for that was that the subject's allowance income indirectly influences the physical activity level, through the accessibility of using sports facilities such as fitness clubs, including have a better transportation opportunity to sports facilities or sports clubs or any sports events[43]. A study byKantomaa[27] found that an increase in allowance incomes showed a likelihood of participating in certain physical activities by genders. Particularly, among those with higher allowance income, male students were more likely to involve in certain sports such as downhill skiing, roller skating, badminton, and tennis, whereas for females, they tend to involve in aerobics, gymnastics, and dancing.

Family social support could come as an organization of supervised activities, provision of material resources, verbal encouragement, or informing how and why PA is important [28]. Family social support has a significant influence on the level of participation inPA[29]. However, our results found that the PA level was not influenced by family social support. Family social support is also identified as a vital factor that motivates students in Australia and the United States to participate in PA, and it was observed that students that received tremendous family support tend to participate in insufficient levels of PA [44].

On the other hand, friend social support recorded a significant positive relationship with physical activity levels, which means that an increase in social support contributes positively to PA levels of the respondents.Hohepa[45] showed that young adults tend to minimize their level of dependency on family and improve their social networks to non-family members. This could be a potential reason for the higher number of study participants received more social support from friends[45].This was consistent with Leslie [46] that found social support from friends emerged as an essential correlate of PA among college students.When people engage in physical activities with others, it helps to develop a positive social norm for physical exercise in the persons' social network [47]. When someone observes the PAbehavior of other people, the person can develop more interest in PA and could be more informed on the positive benefits of engaging in PA[48].

The present study has several limitations that could be improved in future studies. To begin with, the conclusion in terms of causality could not be made due to the cross-sectional design of this study. Furthermore, the self-reporting of PA could enable the participantsto either overestimate or underestimate their reports, which would have caused a recall bias in the result of the investigation. Hence, the use of additional tools or devices to measure PA such as a pedometer or accelerometer is recommended in future studies. Moreover, it is important to include objective measures as it could help to reduce the self-reported estimated error. Third, the study population only involves one faculty in a public university, hence, the study findings could not be generalized to UPM students as well as to the whole public university in Malaysia. Finally, further studies should also identify physical activity barriers among university students, hence appropriate future intervention or public health programs could be implemented accordingly.

8.Conclusion

In thepresent study, the physical activity levels of the university students were consideredsatisfactory. Based on multiple linear regression, the physical activity level is related to physical performance perceived benefits toward physical activity, and an individual's self-efficacy. Therefore, enhancements in self-efficacy toward physical activity and positive perception toward the benefits of physical activity could be used as a strategy to increase physical activity levels among students in a university. Future research could identify physical activity barriers for future intervention or public health program, with the additional use of device tools to increase the accuracy in estimating physical activity levels.

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