

# Predicting Factors of Physical Activity among University Students, Thailand

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## Abstract

**OBJECTIVES:** This descriptive research was aimed at examining the predicting factors of physical activity among university students.

**MATERIAL AND METHODS:** Four hundred undergraduate students at Burapha University, Bangsaen campus, were invited to participate in this study. Data were collected by using questionnaires and multiple linear regressions statistic was used for analyzing the predicting factors of physical activity.

**RESULT:** The research findings revealed that 41 percent of the research participants had a high level of physical activity. Their perceived self-efficacy ( $\beta = 0.43, p < 0.01$ ), interpersonal influences ( $\beta = 0.19, p < 0.01$ ) and perceived benefit ( $\beta = 0.14, p < 0.01$ ) were the significant predictors of physical activity, accounted for 37.9 % of the variance.

**CONCLUSION:** Encouraging young adults to take care of their own health and motivating them to engage in physical activity organized by university health promotion agencies would finally result in their health benefits. Strategies targeted at physical activity, perceived self-efficacy, interpersonal influences and perceived benefit of physical activity should be developed for promoting behaviors of physical activity and exercise.

**Keywords:** physical activity, perceived benefit, self-efficacy, interpersonal influences, young adults

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Physical activity is a basic human function and an important aspect of a healthy lifestyle.<sup>1</sup> It produces positive physiological, psychological and health-enhancing consequences.<sup>2</sup> The benefits associated with physical activity, needed by every person in all age groups, including young adults, are an incentive to be active throughout life. Many recent studies have showed that many young adults have been physically inactive.<sup>3,4</sup> This may be due to their modern lifestyle practices being less conducive to exercise or physical activity.<sup>1</sup> This has led to serious public health consequences, especially the rise of global epidemics, Thailand included, providing evidence of the mismatch between lifestyles and levels of exercise or physical activity requirements.<sup>1</sup>

Physical inactivity has been identified as the most important behavioral risk factor for heart disease, stroke, depression and cancer.<sup>5</sup> This leads to increased morbidity and mortality from non-communicable diseases (NCDs) such as cardiovascular disease, cancer, diabetes, and chronic respiratory diseases, which are common worldwide.<sup>6</sup> The global rates of deaths attributed to NCDs increased from 60% in 2000 to 70% in 2015 and 71 % in 2018.<sup>7,8</sup> In Thailand, NCDs mortality rates increased from 64% in 2000 to 74% in 2016.<sup>9</sup>

Young adults are recommended to spend at least 150 weekly minutes of moderate-intensity, or 75 weekly minutes of vigorous-intensity aerobic activity to improve their health.<sup>10</sup> These activities refer to the bodily movements produced by skeletal muscles including activities at work, travel to and from different places and recreational activities. Physical activity helps improve health status and physical fitness.

Although there is strong evidence that physical activity provides numerous physiological and psychosocial benefits for young adults,<sup>11</sup> physical

activity in this age group is still declining; reflecting an increased sedentary behavior.<sup>12</sup> However, according to self-reported data, about 40% of US young adults, ages 20 to 39, did not meet the recommended activity levels.<sup>3</sup> This might be a result of being insufficiently active to achieve the health benefits of regular physical activity. A similar problem is also occurring in Thailand. A survey in 2011 showed that only 27.6 % of adolescents and young adults, aged 15 to 24 reported exercise in daily life and the number has dropped from the 29.3% reported in 2007.<sup>13,14</sup> In addition, the report of physical activity among Thai population in 2015 also showed that adolescents and young adults, aged 15 to 24, had less physical activity of the moderate to vigorous level than that of other age groups.<sup>15</sup> Moreover, 33.8% of Thai adults aged 18 years and above had high levels of physical inactivity.<sup>16</sup> The report also showed that adolescent and young adults aged 15 to 29 spent more time on sedentary behavior than other age groups.<sup>17</sup> Young adulthood is a time of physical, psychological, social, and structural changes, which may influence barriers to and motivations for physical or exercise activity.<sup>18</sup> University students represent a specific subgroup in this period as they are particularly affected by changing life circumstances, particularly in their study activities. Students' daily lives are characterized by sedentary behaviors such as, attending university classes or doing more homework. However, exercise activity in this age group is important because future patterns of adult health are already established at this stage of life.<sup>19</sup> In addition, obesity as a result of lack of physical activity in this age group can affect their health in later life.<sup>20</sup> The age group of young adults is a period when many future health behaviors begin and provide an opportunity for interventions encouraging positive health behaviors including participation in exercise or physical activity. In order to promote health, an effective health promotion program for increasing exercise or physical activity among adolescents and young adults should be designed.

However, understanding the predicting factors of physical activity in the young adult population is the first step in designing a specific health promotion program to increase the level of exercise behavior or physical activity. Based on the above findings, a study has been designed with the objective for evaluating physical activity and predictive factors of physical activity among the university students.

## Materials and Methods

This study was a cross-sectional survey among students of Burapha University, Thailand.

After approved by the Institutional Review Board (IRB), Burapha University, Thailand (ID: Sci007/2562). Data were collected from February to May 2019.

### *The selection criteria for the samples included:*

1. Undergraduate students who were studying in Bangsaen campus

2. Whose ages were 18 years and above
3. Willing to participate in the study

Sample size was calculated by using G-power 3.1.9.2 software; its general medium effect size of 0.15 was predicted, and  $\alpha$  was set to 0.05. The power was set to 0.80, and the required sample size was 349. In addition, an extra 15% of the sample was required in case of missing answers. Therefore, at least 400 undergraduate students were required in total.

### *Instruments*

The tools were developed based on Pender's health promotion model (HPM) framework, as this model covers a wide range of factors. It has been widely used for planning and implementing to change unhealthy behaviors and to promote health effectively. The HPM is based on social cognitive theory according to cognitive-perceptual factors, including the perceived benefits, barriers, and self-efficacy influence engagement in health-promoting behaviors. Modifying factors, including personal characteristics, interpersonal influences, and behavioral factors, are considered to interact with each other to influence the cognitive perceptual processes.<sup>21</sup> Pilot testing of the tools was applied among 30 undergraduate students to evaluate item clarity and estimate the reliability before being used. A multi-section self-administered questionnaire was developed for this population. The first section of the questionnaire consisted of items on demographic data, including variables of sex, perceived health status, exercise experience within 6 months, type of exercise and frequency. The second part of the questionnaire consisted of physical activity perceptual factors. (Table 1)

### *Data collection*

During period of data collection, all participants had participated in the study, carried out in various places inside the university, including the library, computer center, and their faculty buildings. Research assistants approached potential individuals at those places and asked them whether they would be interested in participating in the survey studying physical activity behavior. All individuals received information about the research and were told that their participation in this research was strictly voluntary. Individuals who agreed to participate signed an informed consent form and completed the survey, which took about 15-20 minutes. All participants were thanked for their cooperation at the end of data collection.

### *Data Analysis*

A statistical computer software program was used to analyze data. Descriptive statistics were used to explain the demographic characteristics of the participants, and Pearson's correlation was used to examine the relationship among the variables. Multiple linear regressions were used to analyze the predicting factors of physical activity. In all tests of this study,  $p < 0.05$  was set to be statistically significant.

**Table 1:** Research Instruments, Interpretation and Reliabilities

Factors	Questionnaire	Interpretation	Scores	The internal consistency reliability
The perceived benefit	11-item	The higher the score indicated, the larger the perceived benefit of physical activity would be.	5-point Likert Scale	0.86
The perceived barrier	10-item	The higher the score indicated, the larger the perceived barrier of physical activity would be.	5-point Likert Scale	0.86
The perceived self-efficacy	11-item	The higher score indicated, the higher level of self-esteem would be.	5-point Likert Scale	0.87
The perceived interpersonal influence	11-item	The higher score indicated, the larger the perceived motivational support from peers would be.	5-point Likert Scale	0.88
The perceived environment influence	10-item	The higher score indicated, the larger the perceived environment influence would be.	5-point Likert Scale	0.85
The physical activity including running, yoga, aerobic dance, weight training or walking for exercise	10-item	The higher score indicated, the higher level of physical activity would be.	5-point Likert Scale	0.87

**Results**

A total 400 participants were included in the study and the average age was 18.65 ± 0.74. 94.75 % of all participants had no health problems. About 65 % of the participants were female. Nearly half, 192 (48%) of the respondents perceived themselves in good health. Most of them, 153 (38.25%), claimed to exercise once a month while 96 (24%) had not exercised in the past six months. For those participants who had exercised in the past six months 304 (76%), more than half, 259 (85.20%) and 198 (65.13%) of them, did exercise during 04.00-07.00 pm, at the public park. For physical activity, its related factors, including perceived benefit, perceived barrier, perceived self-efficacy, peer influence and environment influence, were reported by the participants. The participants revealed high level of physical activity, perceived benefit and perceived self-efficacy, and moderate level of perceived barrier, peer influence and environment influence. (Table 2)

For factors associated with physical activity, findings showed that not all variables shared significantly positive relations. Only the perceived self-efficacy, interpersonal influence and perceived benefit of physical activity were significantly and positively related to physical activity levels ( $r = 0.57, p < 0.01$ ;  $r = 0.43, p < 0.01$ ;  $r = 0.38, p < 0.01$ , respectively) while environment influence was significantly and negatively related to physical activity levels ( $r = -0.14, p < 0.01$ ). (Table 3)

Predictive factors on physical activity are displayed in Table 4, in the first step, the perceived self-efficacy ( $\beta = 0.57, p < 0.01$ ) was the significant predictor of physical activity, accounted for 32.7 % of the variance. In the second step, the perceived self-efficacy ( $\beta = 0.47, p < 0.01$ ) and interpersonal influence ( $\beta = 0.21, p < 0.01$ ) both were significant predictors of physical activity, accounted for 36.3 % of the variance. In the third step, the perceived self-efficacy ( $\beta = 0.43, p < 0.01$ ), the interpersonal influence ( $\beta = 0.19, p < 0.01$ ) and the perceived benefit ( $\beta = 0.14, p < 0.01$ ) were the significant predictors of physical activity, accounted for 37.9 % of the variance.

**Table 2:** Demographic characteristics of respondents (n = 400)

Variables	n (%)
<b>Sex</b>	
Male	140 (35.00)
Female	260 (65.00)
<b>Age</b>	18.65 ± 0.74
<b>Health Status</b>	
Had no health problems	379 (94.75)
Had health problems	21 (5.25)
<b>Perceived Health Status</b>	
Very good	71 (17.75)
Good	192 (48.00)
Fair	133 (33.25)
Poor	4 (1.00)
<b>Exercises in the past six months</b>	
Everyday	33 (8.25)
2-3 days per week	118 (29.50)
Once a month	153 (38.25)
No exercise	96 (24.00)
<b>Exercise Place (n = 304)</b>	
Public park	198 (65.13)
Fitness	74 (24.34)
Home	32 (10.53)
<b>Exercise Time (n = 304)</b>	
05.00-08.00	14 (4.61)
11.00-13.00	5 (1.64)
14.00-19.00	259 (85.20)
After 19.00	26 (8.55)
Physical Activity	37.63 ± 7.28
Perceived Exercise Benefit	41.63 ± 6.14
Perceived Exercise Barrier	29.66 ± 6.67
Perceived Self- Efficacy	37.53 ± 6.74
Interpersonal Influence	31.84 ± 7.15
Environment Influence	27.85 ± 6.57

**Table 3** : Correlation among variables

Variables	1	1	1	1	1	1
Perceived Benefit	1					
Perceived Barrier	0.73	1				
Perceived Self-efficacy	0.40**	0.00	1			
Interpersonal Influence	0.33**	-0.13**	0.46**	1		
Environment Influence	-0.04	0.28**	-0.09	-0.11*	1	
Physical Activity	0.38**	-0.01	0.57**	0.43**	-0.14**	1

\* $p < 0.05$ , \*\* $p < 0.01$ **Table 4** : Correlation among variables

Variables	$\beta$	R	R <sup>2</sup>	Adjust R <sup>2</sup>	t value
First step		0.572	0.327	0.325	
Perceived self-efficacy	0.57				13.90**
Second step		0.602	0.363	0.360	
Perceived self-efficacy	0.47				10.45**
Interpersonal influence	0.21				4.71**
Third step		0.616	0.379	0.375	
Perceived self-efficacy	0.43				9.12**
Interpersonal influence	0.19				4.12**
Perceived benefit	0.14				3.25**

\*\*  $p < 0.01$ \* $\beta$  values are standardized regression coefficients from the final stage of regression analysis\*R<sup>2</sup> values are cumulative, with each incremental step adding to the variance explained.

## Discussion

The public health impact of physical inactivity highlights needs for understanding and identifying determinants of physical activity behavior among young adults. A large proportion of previous research points to a decreased physical activity in adolescent and early adulthood with further decrease in adulthood and older adults. Therefore, understanding the factors contributing to physical activity among adolescent and early adulthood is essential for developing effective programs and strategies to promote physical activity in this population group.

Although the level of physical activity in young adults from prior studies is sharply lower than in the adult group,<sup>22</sup> the results of our research indicated that the participants had a high level of physical activity. This is because they perceived a greater degree of self-efficacy, they perceived more benefit from physical activity and interpersonal influence. Moreover, they had more confidence in their abilities to overcome physical activity barriers including weather, work load from class, insufficiency of exercise facilities and places, and so forth.

The degree of the perceived benefits of physical activity (belief in the benefits from the physical activity) was an important predictor of physical activity among respondents. It had been confirmed in several studies that adolescents and young adults had realized the benefits of physical activity.<sup>23-25</sup>

In this study, the greatest perceived benefit from physical activity of the respondents was psychological outlook followed by the benefits of physical performance, preventive health, and quality of life enhancement, especially their studying.

The perceived self-efficacy is the belief in one's own abilities to perform a task or behavior. People with high self-efficacy can confront difficult challenges. People with low self-efficacy, however, are easily convinced of the futility of effort in the face of difficulties.<sup>26</sup> Self-efficacy is based on the idea of the importance of the subjective experience of personal competence in realizing different goals, and not on actual knowledge, abilities and skills. Self-efficacy is assessed as a belief in their own capabilities to coordinate knowledge, abilities and skills to achieve the desired goal. Personal factors such as cognitive, emotional and biological factors, environmental factors and behavior have an interactive effect in the model of mutual determinism.<sup>27</sup> The results of this research showed that perceived self-efficacy is positively associated with physical activity and can predict physical activity among respondents. The results of previous research also showed that self-efficacy directly affects physical activity of young adults.<sup>28,29</sup>

Interpersonal influence is also a strong predictor of physical activity among respondents. Interpersonal influences could have an important effect on the choices, attitudes and behaviors a person adopts. The important interpersonal factor influencing participation in physical activity is social support

from friends, family, and experts. When there is encouragement to undertake physical activity from family, friends, and/or experts, adolescents and young adults are more likely to participate in regular exercise activities. In this study, the respondent's perception of peer support is positively related to physical activity behavior. Peer support has also been acknowledged as an important correlation of physical activity behavior among children and adolescent group.<sup>30-32</sup> Duncan and colleagues found that perception of support from friends was associated with higher levels of physical activity among youth ages 10–14 years.<sup>31</sup> Moreover, Wu and colleagues found that peer influences had both direct and indirect effects on physical activity among Taiwanese adolescents both male and female.<sup>30</sup>

### Limitation

This study might have some limitations although it had been rigorously conducted. The samples comprised 400 undergraduate students representing a narrow age range; therefore, caution needs to be exercised when attempting to generalize to other contexts or populations. Nevertheless, the data were collected via random selection from four of seven health science faculties, and four of eight education and social humanity faculties, thus increasing the potential to generalize our findings to similar populations. As data collected were self-reported, it was essential to minimize respondent burden, so by keeping the questionnaire short, no information was collected on year of study, family care responsibilities, wider

socioeconomic characteristics, or other possibly confounding variables. Further research would need to be conducted in a longitudinal study; it could provide evidence on directions of causality.

### Conclusion

The respondents, who have a higher level of self-efficacy, perceived greater benefits of physical activity, and those who perceived greater social support from friends, have higher levels of physical activity behavior. To improve the health of the young adult age group, health promotion initiatives should be aimed at highlighting the benefits associated with being active and the importance of student's perceptions of self-efficacy, benefits of physical activity and peer support. It is important to suggest based on the research findings that these factors can be applied to improve behavioral change interventions.

### Acknowledgements

We would like to thank the undergraduate research assistants. We are also grateful to the undergraduate students who took part in the project.

### Conflict of Interest

The authors declare no conflict of interest.

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