

The Influence of Level of Involvement in Physical Activity on Mental Resilient and Cognitive Function Among Uitm Puncak Alam's Student

Muhammad Noor Hizami Hamidi, Myra Anatasia Haslee

Département of Physical Education & Health, Faculté of Education, Université Technologie

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ABSTRACT

Regular physical activity benefits physical, cognitive, and emotional well-being. This study evaluated the relationship between physical activity involvement, mental resilience, and cognitive function among university students at UiTM Puncak Alam, Malaysia. A quantitative, exploratory approach was employed using a stratified random sample of 280 students. Data were collected via online surveys, incorporating the International Physical Activity Questionnaire (IPAQ), the Brief Resilience Scale, and an executive function assessment. Descriptive and inferential statistical analyses, including Pearson correlation and regression analysis, were conducted to explore the relationships between variables. The demographic analysis revealed a majority of participants aged 18-24 (75.4%), with most living in rural areas (36.1%). While no significant relationship was found between physical activity and mental resilience ($r = .110$, $p = .067$), a weak but significant positive correlation was identified between physical activity and cognitive function ($r = .149$, $p = .013$). Regression analysis showed that physical activity explained 2.2% of the variance in cognitive function but only 1.2% in mental resilience. The findings suggest that physical activity involvement significantly enhances cognitive function, including attention, memory, and decision-making skills. However, mental resilience may be more influenced by socioeconomic factors and environmental stressors than by physical activity alone. Physical activity positively impacts cognitive function but does not significantly predict mental resilience among UiTM Puncak Alam students. Future studies should explore these relationships in diverse populations and consider additional factors influencing mental resilience.

Keywords— Physical Activities, Mental Resilience, Cognitive Function, University's Students, Physical Education & Health

INTRODUCTION

Engaging in regular physical activity brings numerous benefits that extend beyond physical health to significantly impact cognitive and emotional well-being [9]. Physical activity strengthens muscles and bones while also promoting brain health by increasing heart rate, which in turn enhances blood flow and oxygen supply to the brain. This increased oxygenation supports various cognitive functions, such as improved thinking, learning, and problem-solving skills, which are crucial for both academic performance and everyday decision-making processes. Studies have shown that such physical activities contribute to the maintenance of a healthy brain by fostering neuroplasticity, which allows the brain to adapt and form new neural connections [1].

Moreover, physical activity is associated with psychological benefits, including the enhancement of mood and reduction of anxiety and depression. This is largely due to the release of endorphins, natural chemicals produced by the brain during exercise that can act as mood elevators and stress relievers [3]. Endorphin release can induce feelings of happiness and relaxation, helping individuals manage stress more effectively and maintain emotional balance [1]. These emotional benefits are particularly important for university students, who often face high levels of stress due to academic and social pressures [4]. Students who regularly engage in physical activity may experience improved memory, greater focus, and enhanced motivation, collectively contributing to better academic outcomes [12].

The combination of these cognitive and emotional benefits highlights the importance of incorporating regular physical activity into one’s daily routine to foster both mental and physical resilience. As shown in various studies, maintaining an active lifestyle not only boosts brain function but also supports overall mental health, enabling individuals to better cope with challenges and stressors [12]. Therefore, this study aims to evaluate how physical activity correlates with these two critical mental aspects in university students.

METHODOLOGY

A quantitative approach with an exploratory framework was used, using online surveys distributed via Google Forms to students at UiTM Puncak Alam. The survey aimed to assess the impact of physical activity on mental resilience and cognitive function. The target group was public university students in Malaysia, specifically at UiTM Puncak Alam. Stratified random sampling ensured representative subgroups within the sample. The survey included four sections: Demographics (Section A), The IPAQ for physical activity (Section B), Brief Resilience Scale (Section C) and Executive function assessment (Section D). The survey was distributed via social media and email. Participants were informed about the study's purpose and provided consent. The questionnaires were available in English and Bahasa for better comprehension. Ethical approval was obtained, ensuring participant anonymity and voluntary participation. Descriptive statistics was used to summarize participant demographics and activity levels, while inferential statistics (correlation & regression analysis) explored the influence of the level of involvement in physical activity on mental resilience and cognitive function among UiTM uncak Alam’s students.

RESULT

Upon inspection, all the data were normally distributed based on skewness, kurtosis, and Q-Q plots.

Table I (Demographic)

Category	Data	Frequency (f)	Percent (%)
Gender	Male	104	37.1
	Female	176	62.9
Age	18-24 years old	211	75.4
	25-34 years old	65	23.2
	35-44 years old	4	1.4
Residential Area	Urban Area	67	23.9
	Rural Area	101	36.1
Household Income	RM1000-RM2000	59	21.1
	RM2001-RM3000	83	29.6
	RM4001-RM5000	70	25
	TOTAL	280	100

TABLE II (Correlation)

Mental Resilience		
Pearson Correlation	0.11	Pearson Correlation

Sig. (2-tailed)	0.067	Sig. (2-tailed)
N	280	N

A Pearson correlation test was conducted to determine the relationship between IPAQ level and Mental resilience. There was no significant relationship between IPAQ level and mental resilience, $r(278) = .110, p = .067$.

TABLE III (Correlation)

Cognitive Function		
	Sig. (2-tailed)	0.013
	N	280
Cognitive Function	IPAQ Level	Pearson Correlation

A Pearson correlation coefficient was calculated to evaluate the relationship between IPAQ level and cognitive function. There was a significant weak positive relationship between IPAQ level and cognitive function, $r([280(4)-2]) = .149, p = .013$.

TABLE IV (ANOVA)

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.110a	0.012	0.008	0.61952

TABLE V (Coefficients)

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	1.295	1	1.295	3.374	0.067
Residual	106.699	278	0.384		
Total	107.994	279			
a. Notes:					

A significant regression was not found ($F(1, 278) = 3.374, (p = .067)$). The R^2 was .012, indicating that IPAQ Level explained approximately 1.2% of the variance in mental resilience.

TABLE VI (ANOVA)

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.149	0.022	0.019	0.71101
a. Predictors: (Constant), IPAQ Level				

b. Dependent Variable: Cognitive Function

TABLE VII (Coefficients)

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	3.186	1	3.186	6.302	0.013
Residual	140.539	278	0.506		
Total	143.725	279			

A significant regression was found ($F(1, 278) = 6.302, (p = .013)$). The R^2 was .022, indicating that IPAQ Level explained approximately 2.2% of the variance in cognitive function.

DISCUSSION AND CONCLUSION

The findings from Table V indicate that physical activity involvement does not significantly predict mental resilience ($p = .067$). Demographic data show that 211 out of 280 students fall within the 18-24 age group. According to [8] young adults generally have lower resilience compared to older adults, who tend to maintain strong resilience despite challenges such as financial issues, life experiences, and declining health. The analysis of household income revealed that 29.6% of students are in the RM 2001-RM 3000 range, and 25.0% are in the RM 4001-RM 5000 range. Individuals with higher socioeconomic status (SES) show greater resilience due to better access to social and economic resources [11]. Additionally, living of expenses in urban areas were found to have potential household finance strain due to overspending on non-basic needs compared to basic needs [10]. Previous studies highlighted that financial pressure is one of the critical factors that can reduce the psychological ability to cope with the stressor effectively [7].

Conversely, Table VII shows that physical activity involvement significantly affects cognitive function ($p = .013$). Cognitive function includes various mental abilities such as learning, reasoning, memory, problem-solving, decision-making, and attention [2]. Engaging in physical activity can enhance brain functions, including attention and cognitive flexibility, as well as memory [9]. Regular, moderate-intensity aerobic activity appears to have the greatest effect on cognitive functions [4].

Table II shows that there is no significant relationship between physical activity and mental resilience ($r = .110, p = .067$). This finding suggests that factors such as socioeconomic background and residential area may have a greater impact on resilience than physical activity alone. Financial stress can reduce the psychological resources required for resilience [7]. Furthermore, individuals from lower SES backgrounds often face negative emotions, stressful environments, and limited job choices, which contribute to increased stress and adverse health effects [14].

Finally, Table III indicates a positive correlation between IPAQ levels and cognitive function ($r = .149, p = .013$), demonstrating that physical activity can significantly enhance cognitive abilities. Therefore, the brain areas associated with complex cognitive processes able to gain the benefit from physical activity [5]. Besides, higher levels of physical activity will improve cognitive ability in young adults [13] because regularly performing physical activity has positive physiological and psychological effects on the brain by promoting cognitive function and overall well-being [9].

As conclusion, the result of this study has shown that there is a significant relationship between involvement in physical activity and cognitive function but no relationship between involvement in physical activity and mental resilience among UiTM Puncak Alam's students. This study shows that demographic factors also might influence one cognitive function and mental resilience ability.

RECOMMENDATION

In general, this study focuses on the effect of physical activity involvement on mental resilience and cognitive function among students. For future research, the researcher can use the same purpose of study but in different groups of sample population.

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