



IMPACT OF PHYSICAL EXERCISE ON MOOD REGULATION AND COGNITIVE FUNCTIONING AMONG YOUNG ADULTS

Ashish Pawar

Amity Institute of Psychology and Allied Sciences

ABSTRACT

Physical exercise has long been recognized as a vital component of maintaining overall health and well-being. Beyond its obvious benefits for physical fitness, emerging evidence suggests a profound impact on mood regulation and cognitive functioning among adults. The current review synthesizes existing research to elucidate the complex relationship between physical exercise, mood regulation, and cognitive function in adults. The objective of this study is to explore the relationship among physical exercise, mood regulation and cognitive functioning. The study was quantitative based research, including 155 young adults. Standardized questionnaires were used in the study including Godin Leisure Time Exercise Questionnaire, Cognition Self-Assessment Rating Scale (C-SARS) and Emotion Regulation Questionnaire (ERQ). The results showed the impact of physical exercise on cognitive functioning and no direct relationship with mood regulation.

Keywords: *Physical Exercise, Mood Regulation, Cognitive Functioning*

INTRODUCTION

Physical exercise

Physical exercise is defined as any skeletal muscle-driven movement that involves the use of energy. Any movement, whether it be for recreation, transportation to and from locations, or employment, is considered physical exercise. Physical activity, whether at a moderate or high intensity, is beneficial to health. Walking, cycling, wheeling, sports, active recreation, and play are popular forms of physical activity that anybody may enjoy, regardless of skill level. Frequent exercise has been shown to aid in the management and prevention of non-communicable illnesses like diabetes, heart disease, stroke, and several malignancies. In addition, it lowers blood pressure, supports a healthy body weight, and enhances wellbeing, mental health, and quality of life.

MOOD REGULATION

Mood regulation is a complex and dynamic process involving the intricate interplay of biological, psychological, and environmental factors that collectively influence and modulate an individual's emotional state. At its core, mood regulation refers to the ability to manage and stabilize one's emotions, ensuring a balanced and adaptive response to internal and external stimuli. Biologically, the brain plays a central role in mood regulation, with neurotransmitters such as serotonin, dopamine, and norepinephrine contributing to the intricate neural networks responsible

for emotional processing. The limbic system, particularly the amygdala and prefrontal cortex, plays a crucial role in evaluating and responding to emotional stimuli.

Mood regulation is not a static process but rather a continuous and adaptive adjustment to the ever-changing internal and external landscape. Individuals vary in their innate regulatory capacities, and factors such as genetics, early life experiences, and learned behaviors contribute to the development of unique regulatory styles. Effective mood regulation is essential for mental health and overall well-being, promoting resilience and the ability to navigate life's challenges with emotional balance and stability. Various therapeutic approaches, mindfulness practices, and lifestyle interventions can aid individuals in enhancing their mood regulation skills, fostering emotional intelligence, and cultivating a more positive and resilient mental state.

COGNITIVE FUNCTIONING

The word "cognitive function" is used to describe a wide range of mental functions, including information processing, reasoning, and knowledge acquisition. Perception, memory, learning, attention, decision-making, and language skills are all areas of cognitive function. The mental processes involved in thinking, information manipulation, and knowledge acquisition are together referred to as cognitive functioning. It encompasses several areas, including linguistic skills, perception, memory, learning, attention, and decision-making. Activities of daily living depend on cognitive functioning, and impairment of this functioning can result in dementia or moderate cognitive impairment (MCI) from Alzheimer's disease or other brain illnesses. Tests measuring several cognitive domains, including working memory, executive functioning, and attention, can be used to evaluate cognitive functioning. Studies have demonstrated that a variety of therapies, including cognitive training, physical activity, and a balanced diet, can enhance

cognitive performance. Determining cognitive deficits and creating therapies to enhance cognitive health need a thorough understanding of cognitive functioning and its domains.

REVIEW OF LITERATURE

Sudo and Ando (2019) examined how acute stretching affected the moods and cognitive abilities of young people who were not physically active. Stretching is a low-intensity exercise that works for a variety of people, even those who are not physically active. After ten minutes of whole-body stretching employing yoga poses, the scores for stress, anxiety, melancholy, anger, hostility, exhaustion, and bewilderment significantly decreased, while vigor increased in the nineteen participants. Performance with Stroop interference also declined noticeably. Notably, improved cognitive function related to a larger rise in vigor. These results imply that acute stretching can improve mood states as well as cognitive function in physically sedentary people, with the latter perhaps correlated with elevated mood.

Zink et al. (2020) in their research stated that physical activity (PA), exercise, and cardiovascular fitness are important for improving well-being and lowering the risk of mental health issues throughout adolescence, a critical but sensitive time for the development of mental health. To serve as a protective buffer during this vulnerable phase, this review focuses on these variables as modifiable resilience aspects that may boost top-down control of brain processes and improve self-regulation. The relationship between PA and mental health is examined, with a focus on how self-regulation deficits are frequently present in mental health conditions.

Piccirilli et al. (2019) carried out a study to evaluate the effects of a program that included mental, physical, and social activities on cognitive abilities in healthy persons over 65. After being matched for several variables, fifty individuals without cognitive impairment were randomized at random to either the experimental or control group. The experimental group participated in biweekly multimodal activities for a duration of six months. Pre- and post-test neuropsychological evaluations demonstrated notable gains in executive functioning, memory, attention, processing speed, and mood relative to the control group. The results highlight the potential of an active lifestyle in preventing cognitive decline in ageing and imply that a multimodal strategy can improve mood and cognition in older persons without cognitive deficits.

METHODOLOGY

Aim

To systematically assess and analyze the impact of regular physical exercise on mood regulation and cognitive function in young adults, aiming to uncover evidence-based insights that contribute to a comprehensive understanding of the holistic benefits for mental health and cognitive well-being.

Research Objectives

- To explore the relationship among physical activity, mood regulation and cognitive functioning.
- To assess the impact of physical exercise on mood regulation and cognitive functioning.
- To assess the impact of mood regulation on cognitive functioning.

Hypothesis

- There will be a significant correlation of physical exercise and mood regulation among young adults.
- There will be a significant correlation of physical exercise and cognitive functioning among young adults.
- There will be a significant impact of physical exercise on mood regulation.
- There will be a significant impact of physical exercise on cognitive functioning.

Variables

Independent variables: Physical exercise

Dependent variables: Mood Regulation, Cognitive Functioning

Research Design

The current study is quantitative correlational research where we are exploring the impact of physical exercise on mood regulation and cognitive functioning among young adults.

Sampling size

For this study a total of 155 participants have participated both men and women from an urban population, young adults were the target population from the age 18 to 26 years (young adults).

Measures

- The Godin Leisure-Time Exercise Questionnaire (GLTEQ)

- Cognition Self-Assessment Rating Scale
- Emotion Regulation Questionnaire (ERQ)

Statistical analysis

The data was analyzed by Statistical Package for Social Sciences (SPSS). Quantitative data was depicted using the mean and standard deviation (mean $\pm$ SD) and using percentages and numerical values. Pearson Correlation and Linear Regression method are used.

RESULTS

Table 1

Descriptive statistics of the study

		Mean	Standard deviation
1	GLTA	50.10	30.248
2	EQR	21.05	12.061
3	C-SARS	41.25	10.064

Table 2

Pearson correlation among physical activity, mood regulation and cognitive functioning.

	Godin leisure time	Total ERQ	TOTAL OF C-SARS
Godin leisure time	-		
Total ERQ	0.43	-	
TOTAL OF C-SARS	-0.183 *	0.508	-

* Correlation is significant at 0.05 level

Table 3*Linear regression table of Physical activity and cognitive functioning*

Criterion		Predictors	PHYSICAL ACTIVITY					
	B	S.E.	BETA	T	R	R square	Adj. R sq.	F
COGNITIVE FUNCTIONING	-0.073	0.032	-0.183	-2.288	0.183	0.034	0.027	5.236*

* Correlation is significant at 0.05 level

INTERPRETATION AND DISCUSSION

Scoring of the responses were performed in MS Excel, followed by the analysis in SPSS. Pearson correlation was used to measure the relationship between physical activity, mood regulation and cognitive functioning. Linear regression was used to measure the impact of physical exercise on mood regulation and cognitive functioning and the impact of mood regulation on cognitive functioning. Descriptive statistics were also performed on the data.

Table 1 represents the descriptive statistics of the given data of 160 participants, with mean and standard deviation of 6.95 and 3.197 for sleep quality (PSQI), 19.06 and 6.758 for perceived stress (PSC), 28.47 and 5.172 for academic performance (APS).

Table 2 represent the correlation among physical activity, mood regulation and cognitive functioning. Physical activity shows a negative correlation (-0.183) with cognitive functioning which is significant at 0.05 level, Supported by Frith (2018) Physical activity is individually associated with memory, reasoning, concentration, and planning, and uniquely influences these cognitive functions. Physical activity shows no significant correlation with mood regulation; hence

no such impact is there. Supported by Wardat (2024) Physical activity levels were not significantly related to emotional regulation.

Table 3 represent the linear regression of physical activity and cognitive functioning. There is 3.4% impact of physical activity on cognitive functioning, supported by Lisa (2010) Physical activity has a significant effect on cognitive functions, including learning and memory.

Findings

- There is a negative yet significant correlation between physical activity and cognitive functioning.
- There is no such significant correlation between physical activity and mood regulation.
- Physical exercise has 3.4% impact on cognitive functioning. Hence,
- Hypothesis 1, stating that there is going to be a significant correlation of physical exercise and mood regulation is rejected.
- Hypothesis 2, stating that there is going to be a significant correlation of physical exercise and cognitive functioning is accepted.
- Hypothesis 3, stating that there is going to be a significant impact of physical exercise on mood regulation is rejected.
- Hypothesis 4, stating that there is going to be a significant impact of physical exercise on cognitive functioning is accepted.

CONCLUSION

The current study investigated the impact of regular physical exercise on mood regulation and cognitive function in young adults, aiming to uncover evidence-based insights that contribute to a comprehensive understanding of the holistic benefits for mental health and cognitive well-being. The findings of this paper confirmed the impact of physical exercise on cognitive function in young adults, while providing evidence of a negative significant relationship between them. In contrast, the association of physical exercise on mood regulation was not significant, indicating no such direct relationship between the two.

Therefore, the findings of this study underscore the importance of increasing the extent of physical activity to improve the cognitive functioning in young adults. Although the results did not show a direct relation between physical exercise and mood regulation. However, the explanatory power of physical exercise alone in predicting cognitive function is relatively low, indicating that other factors beyond exercise likely play significant roles in cognitive performance. Therefore, while staying active may contribute to overall well-being, it's essential to consider a range of factors when aiming to improve emotional regulation and cognitive function.

REFERENCES

Britni R. Belcher, Jennifer Zink, Anisa Azad, Claire E. Campbell, Sandhya P. Chakravartti, Megan M. Herting, The Roles of Physical Activity, Exercise, and Fitness in Promoting Resilience During Adolescence: Effects on Mental Well-Being and Brain Development, *Biological Psychiatry: Cognitive Neuroscience and Neuroimaging*, Volume 6, Issue 2, 2021, Pages 225-237, ISSN 2451-9022.

Piccirilli.M, Pigliautile.M, Arcelli.P, Baratta.I, Ferretti.S(2019). Improvement in cognitive performance and mood in healthy older adults: a multimodel approach. *European Journal of ageing*.

Sudo, M., & Ando, S. (2020). Effects of Acute Stretching on Cognitive Function and Mood States of Physically Inactive Young Adults. *Perceptual and Motor Skills*, 127(1), 142-153.