

ANALYSIS THE RELATIONSHIP OF ACADEMIC PERFORMANCE RESILIENCE BODY COMPOSITION AND FITNESS STATUS OF CURRICULUM BASED PHYSICAL EXERCISERS

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Abstract

Purpose: To explore the relationship of academic performance, resilience, body composition, and fitness status among curriculum-based physical exercisers. **Methods:** To execute this study, thirty students (n=30) were selected from the University students, who were curriculum-based regular physical exercisers (Master of Physical Education Students). The data were collected on academic performance, resilience, body composition and fitness variables. **Design:** The collected data were statistically analyzed through correlation and regression analysis for comparison and to find the relationship among the variables of curriculum-based physical exercisers. **Major Findings:** The curriculum-based physical exerciser's academic performance was predicted by the variables like ST, SMM, PRO, MM, SPE, END, BRS, HS, HE, WHP, WE, LALM, BMI, RALM, FM, EWM, PM, IWM, TLM, FAT.

Conclusion: The curriculum-based physical exerciser's academic performance had a significant relationship with the variables of ST, SMM, PRO, MM, SPE, END, BRS, HS, HE, WHP, WE, LALM, BMI, RALM, FM, EWM, PM, IWM, TLM, FAT.

Key Words: Academic performance, resilience, body composition, fitness status and Curriculum based exercisers.

Introduction

Regular physical exercise has been widely considered a key factor in balancing stress, increasing cognitive function, and improving overall physical health. However, every individual diverge in their exercise and daily habits, which may manipulate how stress affects them in their normal life. The researcher aims to explore the relationship between stress mindset, academic performance, body composition, and fitness status among two groups: regular exercisers and non-regular exercisers. Considering these relationships can offer insights into how regular physical exercise influences both physical, mental health, and whether exercise serves as a defensive factor against the negative effects of stress. Stress is an expected part of life in the present society, especially for students and individuals balancing academic performance, personal life, and physical well-being. The way students and individuals recognize and respond to the day to-day life difficulties taking as stress and it is known as their stress mindset plays a significant role in determining its impact on various characteristics of their lives, including academic performance, maintaining their body composition, and overall health and physical fitness status. Normally people think about stress as a negative and a little to be avoided because it leads to poor results: low test scores in children, and students' career burnout in executives, and "choking" in athletes. This mindset increases anxiety, fear, disrupts performance, and finally becomes a self-fulfilling prophecy. However, if people who see stress as a normal part of daily life and with a positive mindset experience stress as exhilarating and invigorating, they can harness the benefits of their extra energy to respond effectively to various challenges. People with the positive type of mindset often end up with better overall performance and outcomes. This positive type of mindset is how elite athletes move toward high-level competitions, such as an example of must-win at playoff game.

Resilience is the development and outcome of successfully adapting to difficult or challenging in our daily life experiences, especially through mental, emotional, and behavioral flexibility and adjustment to internal and external demands. Resilience is defined as a capacity of individuals to navigate their way to the psychological, social, cultural and physical resources that sustain their well-being and their capacity of individual and collectively to negotiate for these resources to be provided in culturally meaningful ways (Unger, et al., 2008).

A number of factors contribute to how well people adapt to adversities, including the ways in which individuals view and engage with the present world, the availability and quality of social resources, and specific coping strategies. The study was to assess the relationship between resilience and academic performance in youth placed at risk. The results highlight the need for an individualised approach to promoting resilience at different groups of youth (Novotny and Vachova, 2016). Children in public care have become a high profile group and represent an important topic and are in the centre of attention of politicians, officials and experts, leading to a series of transformation step and interventions, and to increased efforts to place children

primarily to a family environment (Children on the way, 2014; Walker, 2011). Education, school, school environment and school performance are associated with resilience in several ways. Access to education is generally regarded as one of the factors of resilience (Ungar, 2006). In a wider view, sustaining resilience in school may also affect students themselves by reducing the presence of depression or anxiety, thereby influencing possible academic performance as well as the well-being of students now and in the future (Challen., Machin and Gillham, 2014).

Body Composition

The human body comprises of fat and fat-free mass, including muscles, bones, organs, and fluids. Optimal body composition is characterized by a healthy balance between these two components. Excessive fat mass has been linked to various health issues, including cardiovascular diseases, diabetes, and metabolic disorders. However, a higher proportion of lean muscle mass contributes to improved metabolism, increased energy expenditure, and better health. Regular physical activity is a cornerstone in the pursuit of optimal body composition. Exercise influences body composition through various mechanisms. Firstly, it enhances energy expenditure, helping individual's burn calories and reduces excess fat. Cardiovascular exercises such as running, cycling, and swimming are particularly effective in burning calories and improving overall cardiovascular health. Additionally, resistance training, which includes weightlifting and bodyweight exercises, plays a crucial role in building and maintaining lean muscle mass.

Physical Health

The stress also has a major impact on physical health by the way of thinking on work, responsibility, commitments and challenges in their life. People who over think about stress as harmful and debilitating show higher levels of cortisol, a stress hormone, in response to challenging situations. Over time, this physiological response can lead to bad health outcomes, including higher blood pressure and cardiovascular disease. Improving overall physical health can also help to relieve stress in the present scenario. Regular physical exercise can give to body active and mood changer for people. Regular physical activity not only increases endorphins (the happy hormones), but also helps to clear stressful thoughts from the mind. Physical activity like walking or jogging outside, playing games which will help to break a sweat and enjoy the beautiful surroundings at the same time feel joy.

The study conducted by Sacheck, et al. (2010) “emphasized that regular physical activities, proper weight maintenance, and sufficient skeletal muscle mass during this period are indispensable elements for the prevention of college students in developing metabolic syndrome”.

Stress mindset is conceptualized as the extent to which an individual holds the mindset that stress has enhancing consequences for various stress-related outcomes (referred to as a “stress-is-enhancing mindset”) or holds the mindset that stress has debilitating consequences for outcomes such as performance and productivity, health and well-being, and learning and growth referred to as a “stress-is-debilitating mindset” (Crum, Salovey, & Achor, 2013).

The American Institute of Stress, society is facing a mental health crisis that could yield serious negative consequences for years to come, and the global average number of stressed people is 35% (Boyd, 2024). Stress is the body’s non-specific response to any demand for change or, in other words, physical, mental, or emotional strain or tension. Acute experience of this phenomenon is suitable for people to perform themselves and motivate in a specific context (WHO, 2023).

“An increasingly sedentary lifestyle has been suggested to be a key contributor to the high prevalence of overweight/obesity and associated co-morbidities. With a decline in physical demands at work and for activities of daily living over the past several decades” (Archer, et al., 2013).

Methodology

To explore the relationship of academic performance, resilience, body composition, and fitness status among curriculum based physical exercisers. To executing this study totally N=30 students were selected from the University students they were curriculum based regular physical exercisers (Master of Physical Education Students). The academic performance was assessed by the previous semester exam marks. Resilience was assessed by the Brief Resilience Scale (BRS). Body composition variables measured by the body composition analyzer (Charder-MA601-Bioelectrical Impedance Analyzer). Fitness variables speed measured by the 50 meters run, strength measured by 1RM test and endurance was measured by 12 min run test. The data were collected on academic performance, resilience, body composition and fitness variables. Comparative study design applied and based on the simple random sampling technique the subjects were selected. The collected data were statistically analyzed through the correlation, and regression analysis for comparison and to found the relationship among the variables of curriculum based physical exercisers.

Results

Descriptive Statistics

Variables	N	Mean	SD
Academic Performance (AC)	30	74.36	5.42
Resilience (BRS)	30	3.81	0.26
Stress Mindset (SMM)	30	13.66	6.01
Weight (WE)	30	66.63	13.31
Height (HE)	30	170.25	8.68
Fat Free Mass (FFM)	30	53.24	8.31
Fat Mass (FM)	30	14.40	7.02
Percent Body Fat (FAT)	30	20.45	7.16
Mineral Mass (MM)	30	3.57	0.45
Lean Mass (LM)	30	50.15	7.88
Visceral Fat Area (VF)	30	64.21	36.02
Right Arm Lean Mass (RAL)	30	2.84	0.64
Left Arm Lean Mass (LAL)	30	2.81	0.63
Trunk Lean Mass (TLM)	30	23.70	3.81
Skeletal Muscle Mass (SM)	30	29.54	4.91
Intracellular Water Mass (IWM)	30	24.55	3.88
Extracellular Water Mass (EWM)	30	14.33	2.25
Waist Hip Ratio (WHP)	30	0.86	0.04
Protein Mass (PM)	30	10.77	1.769
Health Score (HS)	30	72.70	4.53
Basal Metabolic Rate (BMR)	30	1519.60	179.95
Body Mass Index (BMI)	30	23.05	3.64
Protein (PRO)	30	16.09	1.34
Total Energy Expenditure (TEE)	30	2158.83	255.43
Subcutaneous Fat Area (SFA)	30	115.69	73.73
Speed (SPE)	30	7.41	0.17
Endurance (END)	30	2425.40	271.24
Strength (ST)	30	58.70	15.77

Correlation																												
	AC	BRS	SMM	WE	HE	FFM	FM	FAT	MM	LM	VF	RAL	LAL	TLM	SM	IWM	EWM	WHP	PM	HS	BMR	BMI	PRO	TEE	SFA	SPE	END	ST
AC	1	.557*	.605*	.009	-.129	-.050	.102	.078	-.066	-.050	.102	.005	.004	-.011	-.042	-.045	-.063	.128	-.046	-.074	-.050	.081	-.067	-.050	.102	-.533*	.520*	.513*
BRS		1	-.666*	-.047	-.386	-.170	.104	.156	-.215	-.167	.103	.078	-.074	-.106	-.159	-.171	-.163	.179	-.154	-.038	-.169	.132	-.160	.170	.103	-.651*	.645*	.642*
SMM			1	-.149	.245	-.139	-.233	-.187	-.051	-.144	-.233	-.271	-.275	-.234	-.160	-.142	-.120	-.446	-.168	-.182	-.139	-.367	.121	-.139	-.233	.961*	-.901*	-.873*
WE				1	.280	.578*	.438*	.499*	.500*	.577*	.437*	.608*	.585*	.600*	.582*	.576*	.574*	.453*	.585*	.109	.578*	.477*	.459*	.578*	.436*	-.146	.324	.306
HE					1	.742*	.071	-.212	.446*	.437*	.070	.581*	.617*	.664*	.527*	.527*	.571*	.124	.517*	.176	.542*	.023	.237	.541*	.070	.241	-.142	-.181
FFM						1	.508*	.186	.965*	1.00*	.508*	.654*	.659*	.677*	.699*	.698*	.689*	.462*	.698*	.379*	1.00*	.600*	.106	1.00*	.507*	-.131	.293	.262
FM							1	.630*	.457*	.514*	1.00*	.559*	.595*	.597*	.521*	.520*	.473*	.596*	.529*	-.360	.508*	.632*	.590*	.509*	1.00*	-.232	.433*	.363*
FAT								1	.133	.193	.931*	.376*	.302	.297	.201	.199	.154	.541*	.211	-.531	.186	.527*	.687*	.187	.531*	-.184	.355	.298
MM									1	.664*	.456*	.567*	.567*	.599*	.659*	.669*	.642*	.355	.653*	.345	.665*	.538*	-.062	.665*	.456*	-.030	.200	.163
LM										1	.514	.657*	.662*	.679*	1.00*	.698*	.689*	.471*	.695*	.376*	1.00*	.605*	-.111	1.00*	.514*	-.137	.300	.267
VF											1	.658*	.594*	.597*	.521*	.519*	.472*	.596*	.528*	.360*	.507*	.632*	-.590*	.509*	1.00*	-.232	.433*	.363*
RAL												1	.691*	.690*	.661*	.652*	.641*	.671*	.666*	.299	.654*	.444*	-.284	.654*	.658*	-.277	.447*	.404*
LAL													1	.692*	.666*	.655*	.653*	.617*	.670*	.348	.659*	.690*	-.208	.659*	.594*	-.277	.439*	.398*
TLM														1	.682*	.676*	.664*	.594*	.687*	.319	.670*	.677*	-.204	.667*	.596*	-.240	.405*	.364*
SM															1	.698*	.688*	.484*	.699*	.378*	.695*	.615*	-.118	1.00*	.520*	-.152	.315	.283
IWM																1	.679*	.479*	.698*	.370*	.695*	.613*	-.115	.690*	.519*	-.139	.303	.272
EWM																	1	.412*	.684*	.389	.690*	.557*	-.084	.689*	.472*	-.103	.260	.233
WHP																		1	.500*	-.101	.462*	.648*	-.563*	.463*	.597*	-.458*	.603*	.501*
PM																			1	.377*	.668*	.623*	-.125	.698*	.528*	-.165	.326	.295
HS																				1	.379*	.046	.592*	.378	.361	-.150	.099	.172
BMR																					1	.599*	-.105	1.00*	.507*	-.131	.293	.262
BMI																						1	-.667	.601*	.632*	-.351	.534*	.486*
PRO																							1	-.107	.690*	.112	-.276	-.234
TEE																								1	.509*	.131	.294	.262
SFA																									1	-.232	.434*	.363*
SPE																										1	-.586*	-.558*

END

1 .648*

ST

1

Regression coefficient of variables on Academic Performance

Variable	<i>B</i>	β	SE
(Constant)	104.543		18.831
BRS	-34.802	-0.725	6.721
SMM	-1.817	-2.014	-0.417
We	3.107	2.718	0.459
He	-1.602	-2.565	0.503
FM	-1.178	-1.526	0.765
Fat	16.805	11.636	3.19
MM	-18.973	-1.601	12.524
RALM	18.085	2.13	11.865
LALM	-4.262	-0.497	9.528
TLM	3.612	2.54	5.166
IWM	10.207	7.311	1.96
EWM	2.901	1.205	2.93
WHP	-672.004	-5.595	-126.106
PM	-31.203	-10.182	13.038
HS	-1.132	-0.946	0.511
BMI	9.12	2.018	1.647
PRO	42.08	10.442	8.07
SPE	22.704	0.737	3.783
END	0.043	0.63	0.007
ST	-0.74	-0.407	-0.13
R ²	.983		

ΔR^2

.967

Discussion

The result stated that curriculum based physical exerciser's academic performance were as predicted by the variables (factors) like ST, PRO, MM, SPE, END, BRS, HS, HE, WHP, WE, LALM, BMI, RALM, FM, EWM, PM, IWM, TLM, FAT. The following studies are supporting the current study. Tanji, et al., (2021) investigated whether resilience impacts the academic performance of Japanese nursing students. There was a significant association between the vitality of resilience components and academic performance among Japanese nursing students. Montas, et al., (2021). A study in the United States, examined the relationship of grit and resilience with academic success, such as GPA, among dental students. Many studies have reported related factors, such as lifestyle (e.g., physical activity, sleep, eating habits, and part-time jobs), which impact the academic performance of university students Currie, et al., (2012); Dubuc, et al., (2017); El, et al., (2018). Beauvais, *et al.* (2014). Reported that the association between resilience and academic performance was not observed in undergraduate nursing students but was observed in graduate nursing students. Conversely, Montas *et al.*, (2021). Reported that dental students with high resilience or high grit achieved higher GPAs.

Redondo, et al., (2021) examined the study to analyses body composition, anxiety, cardiovascular, and physical activity factors related with academic performance of school students. Results showed a negative correlation between academic performance and age, weight, body mass index and trait anxiety variables. Wu, et al., (2017) stated as obesity has become a pandemic, it is important to spotlight the effect that it has in children. It has been pointed out by previous literature how obesity may have a great impact in academic performance. A recent study by Alswat, et al., (2017) demonstrated no correlation between body mass index (BMI) and school performance, except for physics results, where students with obesity perform worse than those who are normal weight.

Hong and Lee (2016) conducted the effects of the academic performance of college students whose major is sports on body composition and abdominal fat rates. Study found that there was a significant difference among those in the group of students whose academic performance was at the top 20% in terms of body fat mass and body fat rates, which means that academic performance has relatively little effect on body composition and abdominal fat rates. The greatest association was found in a group of Romany adolescents, where resilience explained 24% of variance in academic performance. In addition, academic performance was associated with different resilience factors in each group Challen., Machin and Gillharm., (2014). The study support previous research in that there are clear gender difference in physical self-perceptions Hayes, et al., (1999) and that regular participation in exercise appears to positively related to self-perceptions. For example, fitness instructors and regular exercisers had higher levels of physical self-worth and sports competence than the non-exercisers.

Conclusion: The curriculum based physical exerciser's academic performance was significant relationship with the variables of ST, SMM, PRO, MM, SPE, END, BRS, HS, HE, WHP, WE, LALM, BMI, RALM, FM, EWM, PM, IWM, TLM, FAT.

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