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AN EXAMINATION OF RELATIONSHIPS BETWEEN PHYSICAL ACTIVITIES, COPING STRATEGY AND ACADEMIC ACHIEVEMENT. MEDIATING ROLE OF INTELLECTUAL CAPITAL: A SURVEY OF COLLEGE STUDENTS OF SOUTHERN DISTRICT, KP, PAKISTAN

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Abstract

This study explores the intricate relationships between physical activities, coping strategies, and academic achievement among college students in Punjab District, Punjab, Pakistan. It examines the mediating role of intellectual capital, aiming to understand how engagement in the physical activities influences students' academic success and coping mechanisms. The study hypothesizes that intellectual capital, encircling skills, knowledge, and cognitive abilities, plays a crucial role in translating the assistances of physical asctivzities into improved academic performance. Thus, using a survey methodology, data were collected from the sample of college students, analyzing how their participation in physical activities correlates with their coping strategies and academic outcomes. For this connection, some assumptions about the potential relationships among the research variables have been hypothesized relationships among the research variables in order to examine the variables through different procedures, and extract desired information to attain desired outcomes.

The findings suggest that physical activities positively impact coping strategies, which in turn enhance academic achievement. However, presence of intellectual capital as a mediating factor significantly strengthens these relationships, indicating that the students with higher intellectual capital are better able to leverage physical activities and coping strategies for academic success. This research offers the valuable insights for the policymakers and educators, emphasizing the standing of promoting physical activities and developing intellectual capital to improve students' academic performance. The results provide significant information about the association over collection, impact over regression and mediation over mediation procedures in order to attain the desired information in reaching the conclusion and making the decisions about rejection and acceptance of hypotheses. In this connection, some recommendations have been extracted from the outcomes of this research in order to contribute the knowledge theoretical as well as empirically in literature.

Keywords: Physical Activities, Coping Strategy, Academic Achievement & Intellectual Capital

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INTRODUCTION

In contemporary academic landscape, the holistic development of students has gained attention of educators, researchers, policymakers alike thus, recognizing multifaceted nature of academic achievement, existing study investigates the intricate interplay amid physical activities, coping strategies and intellectual capital, with an emphasis on their impact upon academic success. The modern educational paradigm extends beyond the traditional metrics of academic achievement to encompass broader spectrum of skills and attributes contributing towards student success [1]. The physical activities and coping strategies have been identified as key factors inducing students' mental and emotional well-being, that in turn impact their academic performance [2]. Moreover, the emergence of intellectual capital as a valuable resource in educational contexts highlights the need to explore its mediating role in relationship between physical activities, coping strategy, and academic achievement.

Engaging in physical activities has been associated with numerous cognitive and psychological reimbursements. Studies have shown that regular physical exercise enhances cognitive function, concentration, and memory, thereby potentially influencing academic achievement [3]. Still, the mechanisms through which physical activities exert their impact upon academic success remain complex and warrant further investigation [4]. The capability to cope with stress and challenges is crucial for students facing the demands of academic life. The effective coping strategies not only contribute to mental well-being but may influence persistence, motivation, and overall academic performance [5]. Understanding the nuanced relationship between coping strategies & academic achievement can provide the insights into the development of support systems for the students. The intellectual capital thus includes the knowledge, skills, and intellectual resources that the individuals possess.

The researchers need to synthesize the results from various studies to construct a more inclusive understanding about relationship amid physical activities, coping strategies, intellectual capital and academic achievement [6]. The research exploring the relationships among physical activities, coping strategies, and academic achievement with intellectual capital as a mediator is an emerging area that needs further investigation. The evolving research holds promise for shaping education practices that holistically support student well-being & academic success [7]. Thus, engaging in physical activities positively influences cognitive function, concentration, and overall well-being [8]. The intellectual capital within educational institution mediates this relationship by providing a conducive learning environment, fostering collaboration, and enhancing academic experience [9]. Thus, there is need to revisit the desired relationships in other context to produce innovative and leading outcomes.

LITERATURE REVIEW

Numerous studies have established a positive association between physical activities and mental health. The regular exercise is linked to reduced symptoms of anxiety and depression, improved mood, & enhanced overall psychological well-being [16]. The students often face various stressors related to academic demands, exams, and social pressures. Coping strategies play a crucial role in how individuals manage and navigate these stressors [17]. The effective coping strategies have been shown to mitigate the negative impact of stress on mental health and academic performance. Thus, engaging in physical activities has been identified as a coping strategy to deal with stress as exercise is linked with release of endorphins that act as natural mood winches [18]. It subsidize to

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improved stress management and adoption of adaptive coping mechanisms. The relationship between mental well-being and academic achievement is complex and multifaceted and needs additional exploration.

The high levels of stress can negatively affect the cognitive functioning and academic performance, positive mental health, facilitated by actual coping strategies, is linked with better concentration, focus, and learning outcomes [19]. The intellectual capital encompasses broad range of cognitive resources, including knowledge, skills, and cognitive abilities. It represents an individual capacity to learn, adapt, and contribute effectively to academic and professional domains [20]. As holistic measure, intellectual capital goes beyond academic achievement alone. The intellectual capital is posited to mediate the relationship between physical activities, coping strategies, and academic achievement [21]. In this linking, engaging in physical activities may enhance cognitive functions, contributing to development and maintenance of intellectual capital. Moreover, positive coping strategies may influence intellectual capital by fostering a resilient and adaptive attitude towards desired consequences.

The physical regular activity is known to improve cognitive function, concentration and memory that can directly enhance academic performance. It also reduces anxiety and stress, contributing to a better learning environment [31]. Effective coping strategies allow students to manage stress, stay focused on academic tasks, and maintain emotional stability, which can result in the better academic outcomes. Physical activities can help students develop better coping strategies, such as resilience and stress management that in turn can lead to improved academic performance [32]. Engaging in physical activities can foster adaptability and resilience, which are key components of active coping strategies. Coping strategies often involve problem-solving, which is essential for academic success, in challenging situations with higher intellectual capital tend to perform better academically [33], serve as a stress reliever, enabling students to cope better with the academic pressures and challenges.

Intellectual capital, which includes knowledge, competencies and skills, directly contributes to academic achievement. The effective coping strategies can enhance the ability to learn and apply knowledge, thus contributing to intellectual capital [34]. Thus, the intellectual capital promotes continuous innovation and learning, which are critical for academic success. Physical activities stimulate cognitive development that is key component of intellectual capital [35]. Participation in group sports and activities can enhance social skills and networking, contributing to the social aspect of intellectual capital. Students who cope well with challenges and stress are likely more to accumulate intellectual capital through persistent learning and adaptation. Intellectual capital may act as mediator, where cognitive and social benefits gained from physical activities contribute to academic success [36]. Physical activities, coping plans, academic achievement, and intellectual capital is interdependent.

The intellectual capital can mediate affiliation amid coping strategies and academic achievement by enhancing the application of skills and knowledge in academic settings [37]. Understanding these linkages help in designing educational interventions that indorse physical activity, effective coping strategies, and intellectual capital development, leading to better academic outcomes [38]. Physical activities not only contribute directly to academic performance but enhance also coping strategies and intellectual capital, further support academic success. Below is an exploration of how intellectual capital functions in context as intellectual capital refers to the intangible assets of knowledge, skills,

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competencies, and experiences that an individual possesses [39]. Intellectual capital plays a crucial mediating and linking role in the relationship between physical activities, coping strategies, and academic achievement. The relationships and networks enhance learning and knowledge sharing.

RESEARCH METHODOLOGY

This study is quantitative in nature that aims to examine relationship in chasing the hypotheses and reaching conclusion. The positivism approach was used to chasing relationships among research variables (physical activity, coping strategies, academic achievement and intellectual capital) of study. The research approach specifies the way through which data is collected from the respondents by retrieving them to reach their answers about variables of research in order to reach required conclusion through justification towards desired outcomes. The population of interest in this research is students hailing from colleges in KP, Pakistan wherein 2890 students from colleges wherein a sample is drawn from population (332), has been extracted by using the sampling formula widely used in the social research studies. Thus, 378 questionnaires were distributed among which 332 were recollected and used for analysis. Similarly, the random simple technique was used to access the population of study which comes under the non-probability technique to ensure required data from diverse dimensions. Also, both secondary and primary data were used to collect data from respondents and from existing knowledge databased to analyze data to reach conclusion. The questionnaires were adopted from previous studies. Similarly, 5-point Likert scale was used to record responses of respondents about research issues in particular context to access respondents and achieving desired outcomes.

RESULTS OF STUDY

Descriptive Statistics

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Physical Activities	322	1.30	4.80	3.3190	.77961
Coping Strategy	322	1.80	4.60	3.3181	.81505
Intellectual Capital	322	1.70	4.70	3.5208	.59649
Academic Achievement	322	1.63	4.62	3.3805	.62009
Valid N (listwise)	322				

The research always provides the valuable information from different dimensions that include the descriptive and inferential analysis. The descriptive statistics offers information about research variables from different perspectives like sample-size, mean, minimum and maximum responses' rates standard deviations. In this connection, the results of current study provide important and leading information about all the research issues with respect to above-mentioned perspectives to reach conclusion.

H-No. 1 There is positive association between physical activities, coping strategy, academic achievement and intellectual capital (H1).

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Correlation Analysis

		[1]	[2]	[3]	[4]
Physical Activities [1]	Pearson Correlation	1	.360**	.486**	.462**
	Sig. (2-tailed)		.000	.000	.000
	N	322	322	322	322
Coping Strategy [2]	Pearson Correlation	.360**	1	.344**	.367**
	Sig. (2-tailed)	.000		.000	.000
	N	322	322	322	322
Intellectual Capital [3]	Pearson Correlation	.486**	.344**	1	.517**
	Sig. (2-tailed)	.000	.000		.000
	N	322	322	322	322
Academic Achievement [4]	Pearson Correlation	.462**	.367**	.517**	1
	Sig. (2-tailed)	.000	.000	.000	
	N	322	322	322	322

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

The correlation analysis offers significant information about the association among the research variables like physical activities, coping strategy, academic achievement and intellectual capital in terms of strength and direction in relationships among the research variables in the particular context. The results of correlation provide important information about the desired associations likewise physical activities and intellectual capital (R= .486 & P = .000), coping strategy and intellectual capital (R= .344 & P = .000), academic achievement and intellectual capital (R= .517 & P = .000), and thus from these correlation results, the hypothesis about the association is therefore accepted in study.

H-No. 2 There is positive impact of physical activities, coping strategy, and intellectual capital on academic achievement (H2).

REGRESSION ANALYSIS

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of Estimate
1	.590a	.348	.342	.50305

Table 4.9 Regression Analysis

ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	42.956	3	14.319	56.582	.000b
	Residual	80.473	318	.253		
	Total	123.428	321			

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Regression Analysis

Coefficients						
Model		**Unstandardized Coefficients**		**Standardized Coefficients**	**t**	**Sig.**
		B	**Std. Error**	**Beta**		
1	(Constant)	1.078	.182		5.940	.000
	Physical Activities	.187	.042	.235	4.414	.000
	Coping Strategy	.124	.038	.162	3.275	.001
	Intellectual Capital	.361	.055	.347	6.559	.000

a. Predictors: (Constant), Physical Activities, Intellectual Capital & Coping Strategy

b. Dependent Variable: Academic Achievement

The regression procedure was used to examine the cause-&-effect relationships among research variables like independent variables (physical activities & coping strategy), dependent variable (academic achievement), and mediating variable (intellectual capital). The results of regression revealed that there is 34.8% variance in academic achievement is due to physical activities (β = .187 & P-value = .000), coping strategy (β = .124 & P-value = .001), and intellectual capital (β = .361 & P-value = .000), and therefore from the regression results about the cause-&-effect relationship, hypothesis is accepted.

H-No. 3 There is significant mediating role of intellectual capital in linking physical activities and, academic achievement (H3).

FIRST MEDIATION STEPS (A)

Model Summary

R	**R-square**	**MSE**	**F**	**df1**	**df2**	**p**
.4856	.2358	.2727	90.2489	1.0000	320.0000	.0000

Coefficient of Regression

Model	**Coefficient**	**se**	**t**	**p**	**LLCI**	**ULCI**
Constant	2.2876	.1363	16.7780	.0000	2.0194	2.5559
Physical Activities	.3715	.0391	9.4999	.0000	.2946	.4485

Predicting Variable: Physical Activitie

Criterion Variable: Intellectual Capital

Second & Third Mediation Steps (b & ć)

Model Summary

R	**R-square**	**MSE**	**F**	**df1**	**df2**	**p**
.5710	.3260	.2608	80.2489	2.0000	319.0000	.0000

Coefficient of Regression

Model	**Coefficient**	**se**	**t**	**p**	**LLCI**	**ULCI**
Constant	1.2484	.1752	7.1275	.0000	.9038	1.5931
Intellectual Capital	.3984	.0598	6.6606	.0000	.2807	.5161
Physical Activities	.2197	.0492	4.4674	.0000	.1230	.3165

Independent Variable: Physical Activities, Intellectual Capital

Dependent Variable: Academic Achievement

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Vol. 3 No. 10 (2025)

FOURTH MEDIATION STEP (C)

Model Summary

R	R-square	MSE	F	df1	df2	p
.4624	.2138	.3033	79.0562	1.0000	320.0000	.0000

Coefficient of Regression

Model	Coefficient	se	t	p	LLCI	ULCI
Constant	2.1599	.1427	15.1392	.0000	1.8792	2.4406
Physical Activities	.3678	.0414	8.8914	.0000	.2864	.4491

Independent Variable: Physical Activities

Dependent Variable: Academic Achievement

The mediating role of intellectual capital in linking physical activities and, academic achievement was examined through mediation procedure in order to confirm the mediation that whether it is partial mediation or full mediation. The results through four different paths revealed important information in reaching mediation decision. The first path revealed that there is 23.58% variance in intellectual capital is due to physical activities (β = .3715 & P-value = .0000). The second and third paths revealed that there is 32.605 variance in academic achievement is due to the physical activities (β = .2197 & P-value = .0000), and intellectual capital (β = .3984 & P-value = .0000). The fourth path revealed that there is 21.38% variance in academic achievement is due to the physical activities (β = .3678 & P-value = .0000). the mediation confirmed that intellectual capital partially mediated the relationship between physical activities and, academic achievement due to decrease in coefficient value from (.3678) in direct relationship to (.2197) in indirect relationship, and thus hypothesis is accepted.

DISCUSSION

In contemporary academic landscape, the holistic development of students has gained attention of educators, researchers, policymakers alike thus, recognizing multifaceted nature of academic achievement, existing study investigates the intricate interplay amid physical activities, coping strategies and intellectual capital, with an emphasis on their impact upon academic success. The modern educational paradigm extends beyond the traditional metrics of academic achievement to encompass broader spectrum of skills and attributes contributing towards student success [1]. The physical activities and coping strategies have been identified as key factors inducing students' mental and emotional well-being, that in turn impact their academic performance [2]. Moreover, the emergence of intellectual capital as a valuable resource in educational contexts highlights the need to explore its mediating role in relationship between physical activities, coping strategy, and academic achievement.

The particular mechanisms are complex and multifaceted, there is evidence to suggest that regular physical activity have positive impact upon cognitive function, academic performance, and overall intellectual capital [10]. The physical activity has been linked with enhanced cognitive functions such as attention, memory and executive functions. The regular exercise can positively affect brain structure and function, promoting neuroplasticity and release of neurotransmitters that support cognitive processes [11]. Some studies suggest a positive correlation between physical activity and academic performance. The students who engage in regular physical activity experience improved concentration and academic outcomes [12]. The physical activity contributes to better classroom behavior, which can positively influence the learning environment. The

physical activity has been linked to increased neurogenesis, synaptic plasticity as these processes is essential for desired learning and memory.

In the context of education, intellectual capital extends to collective knowledge within academic community. Thus, recognizing its importance, this study investigates how intellectual capital may act as mediating factor, shaping influence of physical activities and coping strategies on academic achievement. This research endeavors to contribute to existing body of knowledge by shedding light on dynamic relationships between physical activities, coping strategies, intellectual capital, & academic achievement. Similarly, understanding these interconnections is pivotal for fostering a conducive learning environment that nurtures both the physical and intellectual dimensions of students' development. In this linking, to delve deeper into the interconnections among physical activities, coping strategies, academic achievement, and intellectual capital, it is useful to explore specific studies or models that investigate these relationships holistically in order to produce new & innovative knowledge.

RECOMMENDATIONS

1. Educational institutions should prioritize the inclusion of regular physical activities in the curriculum as physical activities enhance coping strategies and intellectual capital, leading to academic outcomes.
2. Educators and policymakers should adopt the holistic approach to student development, recognizing interconnection of physical, cognitive & emotional growth resilience needed for the academic success.
3. Schools should provide resources and training that help students develop effective coping strategies can amplify the benefits of physical activities and contribute to better academic performance for success.
4. Educational programs should stress importance of intellectual capital by incorporating activities that stimulate cognitive development that challenge students to use intellectual resources effectively.

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