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TABLE OF CONTENTS

Volume 8, Issue 2: Jan-June, 2024

Research Articles

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IJPESS International Journal of Physical Education and Sports Sciences

Research Article

Volume 8, Issue 2, Jul-Dec 2024

Parental Involvement and Students Academic Outcome: Exploring the Mediating Role of Academic Motivation

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ABSTRACT

The research is aimed to determine the influence of mediating variable academic motivation in relationship between parental involvement and academic outcomes (dropout/pass) partially and complementarily among intermediate 1st-year students. Additionally, significant differences were explored in independent variable of parental involvement and mediating variable of academic motivation between passing and dropout students. The study included randomly selected 350 intermediate students; 223 passed the part-I annual examination, whereas 127 did not. Data on parental involvement, academic motivation, and academic outcomes were collected and analyzed using mediation and comparative (inferential) statistical methods. The hypotheses were supported by the results: the association between parental involvement and academic outcomes was partially mediated by academic motivation. Furthermore, complementary mediation was observed, indicating that academic motivation enhances the effect of parental involvement on academic outcomes. Pass students exhibited significantly higher levels of parental involvement and academic motivation compared to dropout students. The findings suggest that both parental involvement and academic motivation play crucial roles in determining academic outcomes among intermediate 1st-year students. Enhancing parental involvement can positively influence academic motivation, thereby improving academic success and reducing dropout rates. Based on the results, it is recommended to promote strategies that increase parental involvement in students' academic lives. Schools and policymakers should also focus on fostering academic motivation among students, particularly those at risk of dropping out, to enhance their academic performance and retention.

Keywords: *Academic Outcome, Academic Motivation, Family Engagement, Parenting*

INTRODUCTION

In the context of globalization, fostering robust personality development and nurturing academic drive early on is crucial for aligning youth with international education standards through parental support and encouragement (Lerner et al., 2022). Parental involvement, in any form, contributes to significant increases in students' academic achievement, regardless of age. Starting this practice early increases students' academic motivation (Barger et al., 2019; Helm et al., 2023).

Parental encouragement and active support are essential for instilling enthusiasm and ambition for academic success in young students. This combination of responsibility and dynamic engagement powers their motivation (Vandergrift & Greene, 1992). UNESCO's Education 2030 initiative aims to achieve the Sustainable Development Goal by ensuring that all children are academically prepared through parental involvement from early childhood by 2030.

Students who lack parental involvement in educational activities from an early age struggle in higher grades and have low academic aspirations (Fan & Williams, 2010). Parental involvement includes parents' participation at home, such as communicating about expectations, assisting with studies and homework, offering advice and encouragement, and communicating with teachers and children about schoolwork (Skaliotis, 2010).

Parental involvement encompasses plenty of actions and beliefs related to sending children to school and supporting their learning outside of school, such as advocating for them, communicating with school staff, and being actively present in school activities (Epstein, 1992). In general, parental involvement refers to the effort's parents undertake to assist their children's learning during

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their school years (Avvisati et al., 2010). In developing countries, demographic factors such as household income, educational attainment, limited credentials, and local traditions can stymie parental involvement, crucially affecting children's academic achievements (Smith & Antoniavoigt, 2021).

Research shows that collaboration among parents, families, and communities are associated with improved academic performance in children and play their part to highlight the dropout ratio (National Education Association, 2008). The strength of the student-teacher bond entirely mediated the relationship between parental participation and teachers› assessments of the child›s academic performance (Boonk et al., 2018).

Research on parenting styles identified communication, supervision, and parental expectations as significant parts of parental participation, with communication being the most important predictor. The study found that the way parents vent academic motivation to their children has a substantial impact on academic outcomes. It also highlighted a substantial link between parental expectations and children's perceptions of these expectations, which linked to improved academic performance (Fan & Chen, 2001)

Early academic motivation in the early years refers to a student's excitement, as evidenced by their attitude, dedication, and attention to school subjects during the start of their educational journey (Wentzel et al., 2017). A motivated child is more likely to achieve academic achievement if they recognize the importance of education in all aspects of their lives, including school, employment, and community (Zaccoletti et al., 2020). The term "dropout rate" describes the proportion of students who do not finish a certain course at their school or college (Glennie et al., 2012). Dropout rates have a substantial long-term impact on students' education and job opportunities, as well as their social and economic well-being (Shahidul & Karim, 2015). Therefore, Academic motivation had a role in mediating the link between life satisfaction and learning burnout among university students (Chen et al., 2023).

A study revealed that how parents, as children's first coaches, assist them understand the social, emotional, cognitive, and physical world (Bornstein, 2015). The reasons behind the drop out of students from school have been widely studied due to the significant differences in education levels (Fan & Wolters, 2014).

Approximately 45% of college dropouts within the first two years can be attributed to students' perceptions of their academic performance. Poor performance reduces satisfaction and alters attitudes about post-college earnings (Stinebrickner & Stinebrickner, 2014). Improvements in performance indicators in subsequent years have been espy when dropout rates increase in institutions (Glennie et al., 2012). Research supports the idea that children benefit from their parents' engagement in school activities, particularly in improving academic outcomes (Fan & Wolters, 2014).

Two types of motivation are identified by Self-Determination Theory (SDT): extrinsic motivation and intrinsic motivation, which is motivated by the inherent pleasure of engaging in activities drive to achieve and self-satisfaction. Internal rewards and personal interest drive this type of motivation, which causes people to pursue tasks that they find inherently enjoyable or fulfilling (Ryan & Deci, 2001). A psychological condition characterized by a lack of interest to initiate or sustain goal-directed activities is known as amotivation (Ratelle et al., 2007).

The innate urge to study and explore for personal reasons is known as intrinsic motivation. Conversely, extrinsic motivation is driven by external standards and factors, such as rewards and regulations. According to the findings, intrinsic motivation was the most significant contributor to academic performance (Kocsis & Molnár., 2024)

Research conducted in Pakistan indicates that parents feel disempower by the educational system due to their lack of knowledge essential for active participation in their children's schooling (Tahir, 2016). Pakistan, a developing country with a literacy rate of 65%, should prioritize early parental counselling for academic motivation in both public and private institutions (Zubair et al., 2023). In Karachi, a major city in Pakistan, there are working parents, single parents, and parents with lack of education who confront time constraints and lack awareness about engaging with their children early on. Previous studies have highlighted the necessity for research on parental involvement and academic motivation in early childhood in low-literacy nations such as Pakistan (Naeem & Khan, 2023). Therefore, parental involvement substantially influences the academic success and dropout rates of students in the eyes of administrators and policymakers (Ross, 2016.) Researchers and educationist often study academic outcome and related factors to understand the reasons behind students' decision to leave the institution and to develop strategies to support students in completing their education. However, parental involvement was considered a major influencer regarding academic outcome (dropout/pass) among the boys' students of public sector colleges of district Bhakkar, Punjab Pakistan. Therefore, it was inappropriate to ignore the

factor of motivation among the students by showing their personal resilience/interest towards academic. Resultantly, mediating variable (academic motivation) was taken to determine the mediating role in association between parental involvement and academic outcome.

The objectives of this study are to investigate whether academic motivation mediates the association between parental involvement and student academic outcomes (Dropout/Pass). Additionally, the study aims to determine the nature of mediation (whether complementary or competitive) between the predictor variable (parental involvement), the mediator (academic motivation), and the outcome (Dropout/Pass). Furthermore, the study seeks to evaluate the significant differences between dropout and pass students in terms of parental involvement and academic motivation.

On the basis of above objectives and literature following hypothesis were developed, H_1: Academic motivation mediates the relationship between parental involvement and academic outcomes (Dropout/Pass). H_2: Academic motivation mediates the relationship between parental involvement and academic outcomes (Dropout/Pass) in a complementary manner. H_3: Pass students score significantly higher in parental involvement compared to dropout students. H_4: Pass students score significantly higher in academic motivation compared to dropout students.

The significance of the study lies in its emphasis on the critical role parents play in their children's academic achievement. For students, it highlights the importance of parental involvement and academic motivation in achieving educational success and preventing dropout

MATERIALS & METHODS

Cross-sectional research design provides the easy way to approach and collect the responses on the provided questionnaire. The quantitative approach in this study enables the examination of numerical data to disclose tendencies and associations between variables. The population comprised of the total 2802 number of students appeared in annual intermediate (part-I) examination 2023 from the public sector colleges (boys) of district Bhakkar, Punjab, Pakistan. Taro Yamane formula for the determination of sample size was used and randomly got the total 350 number of students {Dropout 127 (36.29%) & Pass 223 (63.71%)} with the age group of (17-20) years (Yamane, 1973). Validated version of adopted scales for parental involvement scale (five-point Likert-type), and academic motivation scale- college version (seven-point Likert-type) was used to get the responses from the students (Gürbüztürk & Şad, 2010) . Considering ethical considerations by keeping all other information confidential the researcher collected all information within the duration of November 2023 to December 2023 by using hard and soft form of the questionnaire. Reliability of the parental involvement questionnaire was checked by using Cronbach's Alpha (0.90) which was near to the reliability value of (0.91) used by (Raguindin et al., 2021). While the academic motivation reliability score was (0.82) which is near to the reliability value measured by Zurlo et al. in 2023 (>.70) falls in the category of excellent. Statistical operations such as descriptive statistics, independent t-test, Hayes Process, and Logistic regression with log-odds matric for binary outcome was used to analyze all the information for the purposeful results. Statistical Product for Service Solutions (SPSS) version 26 was used to perform the prescribed statistical operations for the analysis of the results.

RESULTS

Table 1 shows the detial of 350 participants. Where 127 (36.3%) students were dropout and 223 (63.7%)were pass in intermediate part-I exams results.

Table 1. Student Status

		Frequency	Percent
Status of Students	Dropout	127	36.3
	Pass	223	63.7
	Total	350	100.0

According to various studies, a sample size of 30 to 500 subjects is required for the application of parametric tests (Bacala et al., 2024; Ross, 2009). In Table 2, Statistical tests such as Kolmogorov Smirnov and Shapiro-Wilk considered as the most appropriate tool for the purpose of data normality (Razali & Wah, 2011). The value of significance of both test is greater than alpha level ($p > 0.05$) for the variable of parental involvement. Therefore, the value of Kolmogorov Smirnov ($p\ 0.29 > 0.05$) rejects the null hypothesis and show a normal distribution which provide a base to use the parametric test in the study.

Figure 1 shows Probability-Probability (PP) plot which is a graphical tool used in statistics to assess the goodness of fit of data in logistic regression model (Hosmer, Lemeshow & Sturdivant, 2013). A PP plot with 45-degree line is considered as a perfect as showing above for the variable of parental involvement as all points are closed

to the line, it indicates a good fit of the model to the data. This signifies that your model reliable, suitable and properly represents the link between predictors and binary outcomes.

Table 2. Normality Test of Parental Involvement

	Kolmogorov-Smirnova			Shapiro-Wilk		
	Statistic	**Df**	**Sig.**	**Statistic**	**Df**	**Sig.**
Parental Involvement	0.14	350	0.20*	0.96	350	0.29

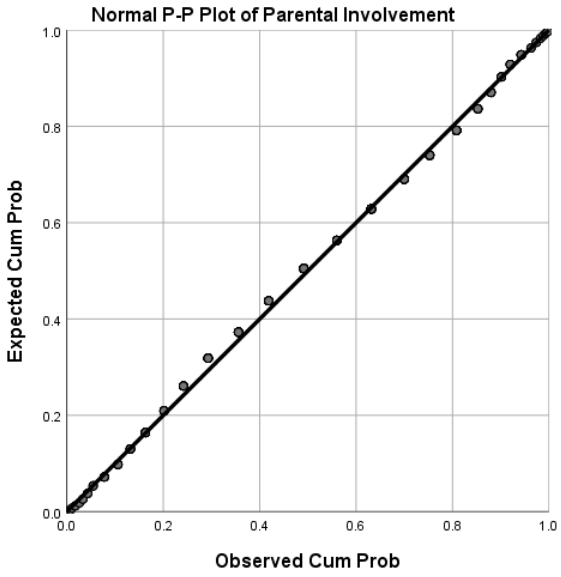

Figure 1. Normal P-P plot of Parental Involvment.

The table 3 shows the value of Kolmogorov Smirnov (p 0.30 > 0.05) reject the null hypothesis and show a normal distribution which provide a base to use the parametric test for the variable of academic motivation.

Table 3. Normality Test of Academic Motivation

	Kolmogorov-Smirnova			Shapiro-Wilk		
	Statistic	**Df**	**Sig.**	**Statistic**	**df**	**Sig.**
Academic Motivation	0.22	350	0.20*	0.96	350	0.30

In Figure 2 P-P plot with 45-degree line is considered as a perfect as showing above for the variable of academic motivation as all points are closed to the line, it indicates a good fit of the model to the data. This signifies that your model properly represents the link between predictors and binary outcomes.

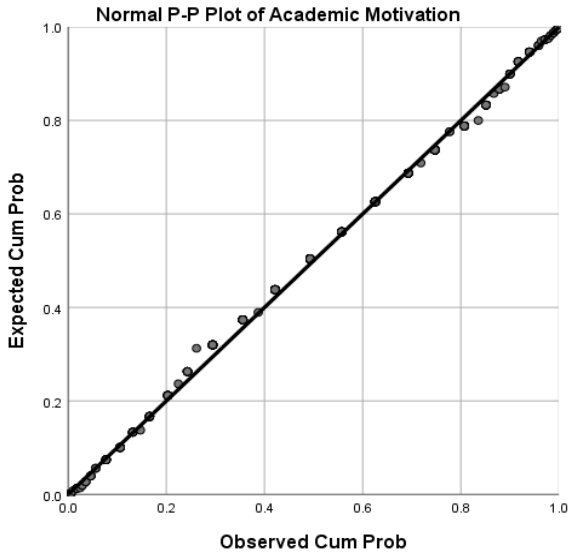

Figure 2. Normal P-P plot of Academic Motivation

Traversing Epstein's parental involvement model (2010) in figure 3 is considered as the most suitable for the assessment of parental involvement in the educational activities of their children (Alameda-Lawson, 2014). The model consists of six different institutional prospective related the involvement of parents for their children in educational attainment was used in this study.

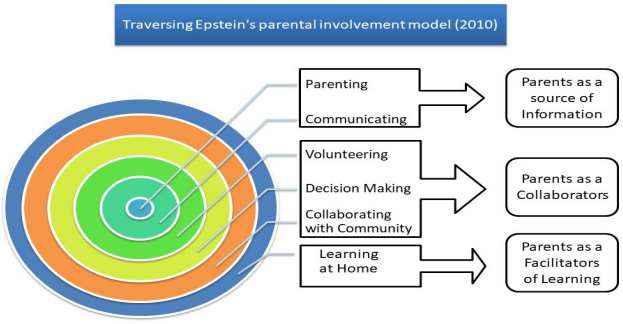

Figure 3. Traversing Epstein's parental involvement model (2010)

The Table 4 shows the different scores of the participants and levels in the variable of parental involvement. A five-point Likert-scale ranging from "Strongly Disagree to Strongly Agree" with 15 statements was utilized to collect answers. A pattern of scores developed by Gitonga, in 2023 was followed to interpret the data for the different scores and levels. The scores of parental involvements

were very low, majority (53.71%) of the participants record their low and below average parental involvement in the studies of their children on Epstein's model.

Table 4. Levels/ Scores of Parental Involvement

Weight	Range	Interpretation	Number	Percentage
1	1.00-1.49	Low/Poor	66	18.85%
2	1.50-2.49	Below average/ Fair	122	34.86%
3	2.50-3.49	Average/ Good	84	24.00%
4	3.50-4.00	Very High/ Very Good	78	22.29%

Mediation Analysis

Hayes' PROCESS mediation analysis is a powerful statistical tool for investigating and measuring the indirect effects of an independent variable on a dependent variable. This approach employs one or more mediator variables and is carried out using Model 4. This method, developed by Andrew F. Hayes, provides a comprehensive approach to understanding the mechanisms underlying observed relationships by breaking them down into direct and indirect pathways (Hayes, 2018). By using this analysis, researchers can determine the extent to which a mediator explains the relationship between the independent and the dependent variable, thus offering deeper insights into the causal processes at play.

Hayes Process mediation analysis is particularly valuable in social sciences, psychology, and behavioral research, where understanding complex interactions and intermediary effects is crucial for theory development and practical applications. Binary logistic regression using log-odds is a statistical approach for determining the association between one or more predictor and binary dependent variable. This technique estimates the probability that a given instance falls into one of the two categories of the dependent variable (Harrell & Harrell, 2015).

The relationship is expressed in terms of log-odds, which are the natural logarithm of the odds of the event occurring. The log-odds are linearly related to the independent variables, allowing for the calculation of odds ratios that indicate how changes in the predictors affect the likelihood of the event. By transforming the log-odds back into probabilities, binary logistic regression provides a straightforward way to interpret the effects of predictor variables on the outcome (Norton & Dowd, 2018). In Table 5 model is highly significant ($p < 0.01$) with an F-statistic of 1256.35, indicating that the predictor variable (Parental Involvement) significantly explains the variance in the outcome variable (Academic Motivation). The R-squared value of 0.78 means that approximately 78.31% of the variability in Academic Motivation can be explained by the predictor Parental Involvement. Parental Involvement coefficient is 0.99. This means that for each additional unit increase in Parental Involvement, Academic Motivation increases by approximately 0.99 units. The p-value for Parental Involvement is 0.00, indicating that this predictor is highly significant in explaining the variance in Academic Motivation. The 95% confidence interval for Parental Involvement [0.94, 1.05] does not include zero, confirming its significance.

Table 6 represents the results of a binary logistic regression analysis conducted using Hayes' PROCESS Model 4. The logistic regression analysis was used to predict the probability of a binary outcome (e.g., Dropout/Pass) based on one or more predictor variables. The coefficient for Parental Involvement is 3.13. This means that for each additional unit increase in Parental Involvement, the log-odds of passing increases by 3.13. The p-value for Parental Involvement is 0.00, indicating that the effect of Parental Involvement on the outcome is statistically significant. The 95% confidence interval for Parental Involvement (1.57, 4.68) does not include zero, further supporting its significance.

The coefficient for Academic Motivation is 2.36. This means that for each additional unit increase in Academic Motivation, the log-odds of passing increases by 2.36. The p-value for Academic Motivation is 0.00, indicating that the effect of Academic Motivation on the outcome is statistically significant. The 95% confidence interval for Academic Motivation (1.22, 3.51) does not include zero, further supporting its significance. The variable Parental involvement has a higher log-odds value (3.13) compared to Academic Motivation (2.36). Therefore, Parental Involvement shows a greater log-odds value with passing.

Table 7 shows direct effect of X on Y is 3.13, meaning that, holding Academic Motivation constant, a one-unit increase in X results in an increase of 3.13 units in Y. The effect is statistically significant ($p = 0.00$), and the confidence interval (1.57, 4.68) does not include zero, confirming its significance.

Table 5. Academic motivation mediates the relationship between parental involvement and academic outcomes (Dropout/Pass).

Model Summary						
R	**R-sq**	**MSE**	**F**	**df1**	**df2**	**p**
0.884	0.78	0.06	1256.35	1.00	348.00	0.00
Model						
	Coeff	**Se**	**T**	**P**	**LLCI**	**ULCI**
Constant	0.07	0.08	0.92	0.35	-0.08	0.23
Parental Involvement	**0.99**	0.02	35.44	**0.00**	0.94	1.05

Table 6. Parental involvement mediates the relationship between parental involvement and academic outcomes (Dropout/Pass).

Model Summary						
L	**Model L**	**Df**	**p**	**McFadden**	**CoxSnell**	**Nagelkrk**
248.39	210.13	2.00	0.00	0.45	0.45	0.61
Model						
	Coeff	**Se**	**Z**	**P**	**LLCI**	**ULCI**
Constant	-14.81	1.70	-8.66	0.00	-18. 16	-11. 46
Parental Involvement	3.13	0.79	3.94	0.01	1.57	4.68
Academic Motivation	2.36	0.58	4.05	0.00	1.22	3.51

Log-odds metric

Table 7. Direct, and indirect effects

Effects	**Se**	**z**	**p**	**LLCI**	**ULCI**
3. 13	0.79	3.94	0.00	1. 57	4. 68
Indirect Effect (s) of X on Y					
		Effects	**BootSE**	**BooLLCI**	**BootULCI**
Financial Resources		2. 36	0.83	0.70	4.09

The indirect effect of X on Y through Academic Motivation is 2.36. This suggests that part of the effect of X on Y is mediated by Academic Motivation. The bootstrapped confidence interval (0.70 4.09) does not include zero, indicating that the indirect effect is statistically significant.

Total Effect= Direct Effect + Indirect Effect

Total Effect=3.1311+2.3675=5.4986

This represents the overall impact of X on Y, including both the direct influence and the indirect influence through the mediator Academic Motivation. H2: Academic motivation mediates the relationship between parental involvement and academic outcomes (Dropout/Pass) in a complementary manner. The medaition model in Figure 4 has partial mediation. This suggests that independent variable (X) have a direct effect on outcome variable and indirect effect in the presence of mediator (Academic Motivation), therefore, H_1 is accepted.

Complementary Mediation: This suggests that X has a positive direct effect on Y, and this effect is enhanced or strengthened by the positive indirect effect through the mediator (Khan et al., 2024). The mediator (Academic Motivation) complements the relationship between X and Y, enhancing the overall effect of X on Y. This interpretation aligns with both the direct and indirect effects being positive and significant, indicating a supportive relationship between X, Academic Motivation, and Y in influencing passing in the logistic regression model. There exists complementary

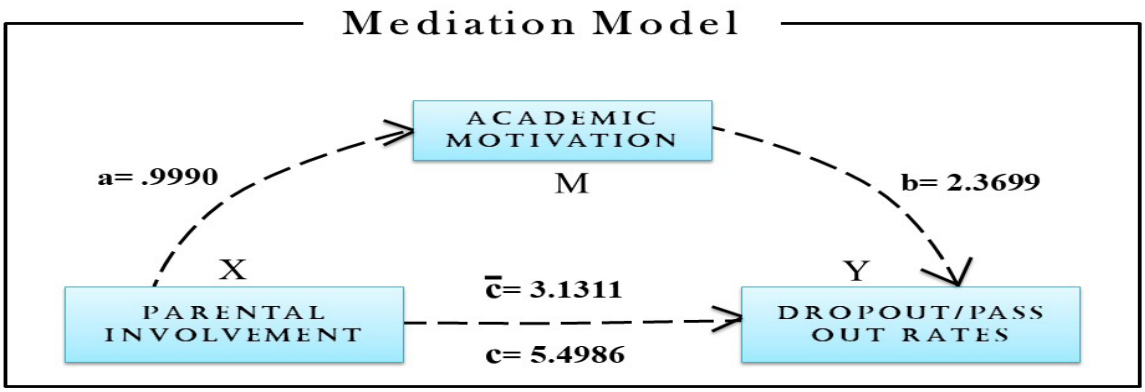

Figure 4. Mediation Model

mediation therefore, H_2 is accepted. Table 8 shows mean score of parental involvement for students who Dropout (2.44±0.27) is significantly lower than the mean score for students who Pass (3.07±0.40). There is a significant difference in parental involvement between students who Dropout and those who Pass. Higher parental involvement is associated with students who Pass, suggesting that parental involvement may play a crucial role in student success. The Figure 5 supports the t-test results, demonstrating a significant difference in parental involvement between students who Dropout (2.44 ± 0.27) and those who Pass (3.07 ± 0.40). The higher parental involvement among students who Pass suggests that parental involvement may be a critical factor in student success. Therefore, H_3 is accepted.

The Table 9 shows mean score of academic motivation for students who Dropout (2.43±0.30) is significantly lower than the mean score for students who Pass (3.18±0.43). There is a significant difference in academic motivation between students who Dropout and those who Pass. Higher academic motivation is associated with students who Pass, suggesting that academic motivation may play a crucial role in student success.

The Figure 6 supports the t-test results, demonstrating a significant difference in academic motivation between students who Dropout (2.43±0.30) and those who Pass (3.18±0.43). The higher academic motivation among students who Pass suggests that academic motivation may be a critical factor in student success. Therefore, H_4 is accepted.

Table 8. H_3: Pass students score significantly higher in the variable of parental involvement compared to Dropout students.

	Descriptive Statistics				Levene's Test for Equality of Variances		t-test for Equality of Means	
	Status	**N**	**Mean**	**Std. Deviation**	**F**	**Sig.**	**Sig. (2-tailed)**	**Mean Diff.**
Parental Involvement	Dropout	127	2.44	0.27	6.36	0.01	0.00	-0.63
	Pass	223	3.07	0.40			0.00	-0.63

Table 9. H_4: Pass students score significantly higher in the variable of academic motivation compared to Dropout students.

	Descriptive Statistics				Levene's Test for Equality of Variances		t-test for Equality of Means	
	Status	**N**	**Mean**	**Std. Deviation**	**F**	**Sig.**	**Sig. (2-tailed)**	**Mean Diff.**
Academic Motivation	Dropout	127	2.43	0.30	1.58	0.20	0.00	-0.75
	Pass	223	3.18	0.43			0.00	-0.75

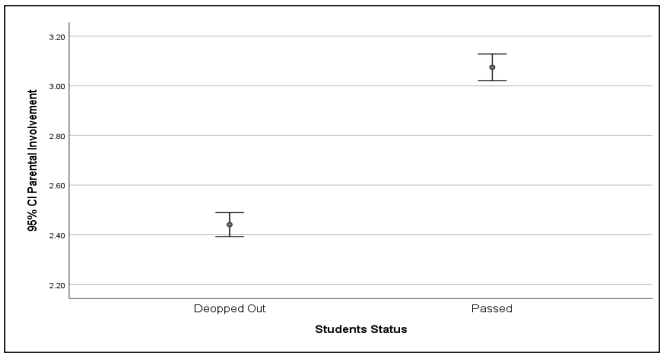

Figure 5. t-test results of Parental Involvment.

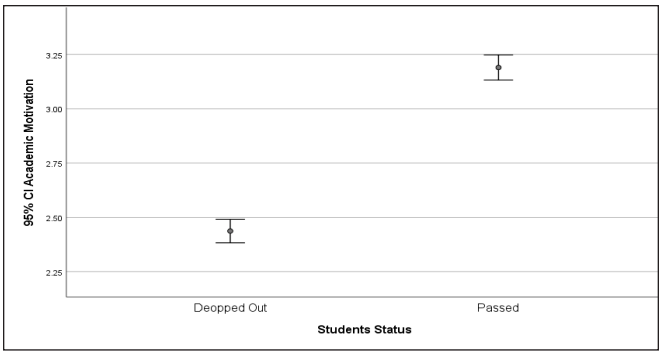

Figure 6. t-test results of Academic Motivation.

DISCUSSION

A normally distributed data was statistically analyzed through Statistical Package for Social Sciences version-26. A significant and positive association was observed among the variables of parental involvement, academic motivation and academic outcome. According to this study, academic motivation somewhat mediates the association between parental participation and students' academic results. Therefore, the academic motivation impacted academic outcome (β of passed out students higher than the dropout students) in the presence of parental involvement. Resultantly, complementary mediation was observed after the analysis. a higher and significant mean difference was observed between pass out and dropout students while comparing for the independent variable (Parental Involvement) and the mediating variable (Academic Motivation). This mean that passed students perceived more parental involvement than dropout students. Meanwhile, the passed students score higher in the variable of academic motivation as compared to the dropout students. It is concluded that parental involvement plays an important role in motivation and results of students either they passed or dropout.

According to the study, different types of parental involvement, such as socialization and emotional support, have a significant impact on adolescents' motivation and academic achievement (Hill & Tyson, 2009). A longitudinal study found that consistent parental support is crucial for maintaining students' motivation and improving their academic outcomes (Gonzalez et al., 2005). It was discovered that both direct involvement (e.g., helping with homework) and indirect involvement (e.g., setting high expectations) positively impact children's motivation and academic success (Fan & Chen, 2001). The researchers found a significant positive link between parental engagement students' intrinsic motivation, indicating that active parental engagement increase students' enthusiasm and interest in their academic pursuits (Marchant et al., 2001). The findings of the studies explain about the self-regulated and intrinsically motivated students wer significantly associated with improved academic performance and greater persistence in academic pursuits (Robbins et al., 2004; Elliot & Church, 1997; Pintrich & De Groot, 1990). Better academic outcomes are possible due to effective learning strategies and internal motivation regarding the academics (Zimmerman & Schunk, 2001).

A study was conducted among mathematics students found that high academic achievement encourages greater parental involvement, which in turn promotes academic success and brings about positive reinforcement (Silinskas & Kikas, 2019). The findings indicate that when their children excel academically, parents become more involved in discussions and provide academic support (Hill & Tyson, 2009). The study's findings demonstrated a positive association between student academic achievement and parental participation, which encourages greater exploration and involvement in children's academic pursuits (Pomerantz, Moorman & Litwack, 2007).

The study's findings demonstrate that students in urban schools with more parental participation are more academically motivated, which improves their academic achievements significantly (Jeynes, 2007). Using mediation analysis among 5th grade Spanish students, the researchers revealed that academic motivation mediates the association between parental participation and academic achievement. Improved academic performance are the result of improved academic motivation, which is driven by substantial involvement from parents (Rodríguez Martínez et al., 2017). The study found that in the presence of parental engagement, the educational level of parents actively moderates academic motivation in Karachi, Pakistan (Naeem & Khan, 2023). A study conducted in 2010 demonstrated that the combined mediating effects of academic motivation and self-regulation significantly improve academic outcomes in collaboration with parental involvement (Fan & Williams,

2010).

Delimitations

This study was carried out in Public Colleges (Boys) of district Bhakkar, (Punjab), Pakistan to get the responses on adopted questionnaire regarding parental involvement, academic motivation and with binary variable of academic outcome (Dropout and Pass) as an outcome variable.

CONCLUSION

This study highlights the significant roles of parental involvement and academic motivation in shaping academic outcomes among intermediate 1st-year students. The findings confirm that both factors contribute significantly to students' academic success, with parental involvement influencing academic motivation, which in turn impacts dropout rates and academic achievement. The results underscore the importance of fostering supportive environments that enhance parental engagement and promote intrinsic motivation among students.

Based on the findings, several key recommendations are suggested. Schools should implement programs and initiatives that encourage and support parental involvement in their children's education, such as workshops, parent-teacher meetings and associations, and regular communication channels (Naeem & Khan, 2023). Educationists and parents should focus on strategies that foster intrinsic motivation among students by providing meaningful learning experiences, goal-setting exercises, and recognition of achievements.

Early identification of students at risk of dropping out and providing tailored interventions addressing both academic and motivational factors is crucial. This could include mentoring programs, counseling services, and academic support. Additionally, policymakers should consider integrating measures to enhance parental involvement and academic motivation into educational policies to ensure sustained support across educational institutions and communities. For future directions, longitudinal studies would provide a deeper understanding of how parental involvement and academic motivation evolve over time and their sustained impact on academic outcomes. As this study focused on a specific cultural context (Bhakkar, Pakistan) and boys' public colleges, future research should explore how parental involvement and academic motivation vary across different cultural settings, socioeconomic backgrounds, and among opposite genders in private schools, colleges, and universities with larger sample sizes. Studies focusing on gender, locality, and races across educational systems and settings could provide insights into how varying educational policies and practices influence the relationships between parental involvement, academic motivation, and academic outcomes.

DECLARATION

Authors' Contribution Statement: Sardar Nasir Sohail Khan was responsible for the conceptualization and design of the study. Naseem Ullah contributed to data collection, analysis, and interpretation. Sofia Saba assisted in writing, editing, and reviewing the manuscript. All authors have read and approved the final version of the manuscript.

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Sports Media and Body Image of Female Athletes: Perception of Women Athletes in Pakistan

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ABSTRACT

This study aims to explore the perception of Lahore-based female athletes about the representation of female athletes in sports media. Body image in every person's mind is different but because of the media people have a mindset that all we see in media is smart, thin, and curvy bodies. Female athlete's body image is not only looking thin, slim, or curvy but after doing the specific sport exercise the body starts looking masculine. Socio-cultural norms become a judgmental criterion about female bodies. Whereas media objectifies females that is if a person is slim, thin, or curvy that is a perfect body that is how a woman should look. For this, researchers conduct interviews of ten female athletes of national and international levels to know their perception of the representation of females on sports media. These ten females were chosen with convenient sampling and a semi-structured interview was conducted which was divided into four themes: The manly body of female athletes, representation of female athletes in media, Female athletes as ordinary women, and Long-term Effects on the body. The results reveal that media representation is biased and media objectifies women and focuses on their bodies as compared to their performance. In Pakistani it is s cultural issue for athlete female to look straight. The curviness or softness of the body is associated with femininity. Masculinity in the body of female athletes is considered as a body damage and it affects the career of female athletes.

Keywords: *Self-Perception, Female Athletes, Peer pressure, Socio-cultural, Sports*

INTRODUCTION

In modern society body image concerns are booming. Pertain to the body image is the consequence of the media and the stereotypical body image approach towards the absurd aspect of thinness. The mindset of the thin, curvy, and smart body has been started from the media mainly but not only that the societal pressure is plenteously a lot on the woman who is not slim and curvy according to the standards one has made (Mccomb, 2023). In today's society media has a strong effect on the body image of female athletes. The body image of female athletes is a different kind of impression in society and the sports field. Body image is defined as the representation of your outer appearance. Female athletes exercise according to the different sports, to compete in the event and to excel in the sports they have to do tough training. On the other hand, playing sports and doing exercise is a very empowering process by which women provocateur themselves, learn their physical competence, and gain a sense of congruence (Liu et al., 2023).

In traditionally male-dominated society when women grow in any field, their bodies are subject to inflation coercion to fulfill the oppressive customary of femininity. It has become very common to female athletes to be unsatisfied with their own body. A survey from Psychology Today shows 56% of the women were infuriated with their body type (Swami et al., 2009). Training and getting a perfect body for a sport makes the female athletes win the sport but they fail to satisfy the ideal body image in society whereas the female athletes don't consider the society's norms but they somehow affect them. Due to the influence of globalization and the advancement of media, aesthetic ideals across various countries and cultures are becoming more homogenized. Cultural norms and expectations may discourage or restrict female athletes from participating in sports activities outside of their homes (Nassif & Khoury, 2022). This limitation on mobility and social interactions can impede their development and access to training facilities. The availability of sports facilities, training programs, and resources specifically tailored for female athletes is often limited. The lack of proper infrastructure, equipment, and financial support contributes to the barriers female athletes face in Pakistan. Female athletes in Pakistan usually struggle with limited media coverage and representation. The underrepresentation of women in sports media can contribute to a lack of visibility,

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recognition, and sponsorship opportunities. This study also covers the cultural barriers that require a multifaceted approach that involves challenging gender stereotypes, promoting awareness and acceptance of female athletes, providing equal opportunities and resources, and fostering a supportive environment for girls and women to pursue sports in Pakistan.

The body is a person's most swift asset and has been used forever as an illustration for society (Shilling, 2008). Our substantial actual qualities, our idiosyncrasies, size, shape, and progress augment and figure our annotations and collaborations through others in daily life (Heywood, 1998).

Inside Western industrialized societies, there have been numerous progressions as to what is seen to be an alluring and solid female body shape (Cash, 2008; Raza & Hamid, 2023). For instance, from the seventeenth century to the mid-twentieth century the most wanted body for a female was a curvy, balanced, and full figure (Grogan, 2008). Media represents women in an objectified manner whether it is entertainment media or news. The glamorization of the female body in media images becoming a norm in media representation. (Ali et al, 2016). One perspective the world and capacities inside it, from the vantage purpose of one's own body, consequently exemplification is a fundamental factor of social association. These exercises help people to keep up their bodies, yet in addition help them in introducing themselves as specific sorts of individuals, and making a personality. The strategies of substantial lead and standards of appearance in basic life are socially molded, have changed over the long run, and contrast from culture to culture (Magdalinski, 2009).

In a recent study in which former female athletes body image was studied and it was clearly shown that the coaches approach impacts the mental and physical health in long term and the athlete's body is the key point of identity. Findings of the study show that there were several distinct challenges which affected the female athletes body image i.e., socio-cultural factors, role of coaches, network outside of sports and social pressure. (Hardie et al., 2022)

Another important aspect is that if the athlete trains and get the perfect body according to the specific sport for the best performance so the body actually doesn't fit the body ideal in the society. For athletes it is good that they are thin for the best results in the sport the target is to win the competition but the other way the definition of being thin in the society meant "thin or lean body is beautiful". Whereas body image plays a vital role in athletes' life. Female athletes at a great level tend to perceive their bodies to be not quite satisfactory in terms of the model to gain success in a specific sport, and are primarily not appease with their body image in sports. (Krane, 2001; Zaccagni & Gualdi-Russo 2023). However, researchers have identified persistent cross-cultural distinctions. For instance, among the youth in Asian nations like China, there remains a prevalent emphasis on being thin, while in the United States, young people exhibit significant concerns about muscularity. These findings suggest that despite some convergence, distinctive body image preferences continue to exist across different regions.

On the basis of above introduction and literature review, this study is aimed to address the following objectives:

1. To explore the media representation of female athlete's body image.

2. To examine the body image perception of female athletes and how it affects their performance.

3. To explore the psychological impact faced by female athletes due to their body image on media.

To address the above objectives, this research is an effort to answer the following research question:

1. How media is representing the body image of a female athlete?

2. Relationship between media and the body image of female Athletes and how does media effect it?

3. What is female athletes' perception of their body representation in media?

MATERIALS & METHODS

The study engages qualitative research design. It includes in-depth interviews with female athletes to understand their experiences of being athletes, and what they though about their media coverage. In interviews the research also know about their training regimes, their relationships with coaches and teammates, their motivation for pursuing their sport, and any challenges they face. What is their perception of athlete's representation on media? In this particular study, semi- structure Interview Procedure was intended.

The population of the study includes the female athletes residing in Lahore city. The sample of the study was the 10 female athletes based on their achievements of different sports in national and international level. The sample was chosen using a convenient sampling technique.

DATA ANALYSIS

The manly body of female athletes

The female athletes interviewed had a range of opinions on how society views women's bodies about femininity and masculinity. Athletes generally disagree with the idea that being physically powerful or having a muscular body inevitably qualifies one as "masculine." They stress that their physique is the consequence of their commitment to their activity and that their physical prowess and athleticism do not diminish their femininity.

The participants in Interview No. 7 essentially refute the idea of a "manly body" and underline that female athletes can be physically fit and strong without sacrificing their femininity. The athletes take great satisfaction in their physical prowess and strength, saying that it is essential for their particular sports. They exude a strong feeling of self-assurance and brush off worries about cultural expectations of femininity. They claim that their performance and well-being take precedence over adhering to conventional gender stereotypes.

"No, not at all it's not necessary, good athletes are lean and fit but not masculine and if you are a rugby player it's the requirement of the sport, I know a player from Pakistan rugby she is strong and masculine and it doesn't make her good or bad." (Interviewee 7)

The eighth interview further disproves the notion that physically dominant female athletes are "masculine." The players embrace their muscularity with pride and regard it as a crucial component of their identity as athletes. They indicate a desire to defy social expectations and dispel gender conventions. The athletes underline that being physically fit does not automatically translate into being a man, and they reject the idea that femininity and athleticism are incompatible.

"Sometimes your muscle show and sometimes don't. Not all the sports women are muscular it depends on the sport some are very petit and lean" (Interviewee 8)

The idea that female athletes should have a "manly body" is similarly rejected by the participants in Interview No. 4. They think that physical prowess and strength do not inevitably make a woman a man. They strongly emphasize the value of muscle growth in the context of their sports and see it as a typical aspect of their preparation. The participants are satisfied with their athletic bodies and reject social expectations to adhere to stereotypical ideas of being a woman.

"I firmly believe that participating in sports necessitates muscle development to prevent injuries. It is important to strike a balance and avoid excessive muscle growth to maintain a feminine appearance. Personally, I embrace my muscularity and do not feel any negative emotions about it. Nevertheless, I acknowledge that some girls may not appreciate it, and when it comes to societal norms and people's opinions, it is unlikely to please everyone." (Interviewee 4)

Overall, it is clear from the interviews that the participants strongly feel empowered and accept their bodies as female athletes. Instead of highlighting the significance of physical fitness, performance, and the pursuit of their athletic goals, they reject the idea that physical strength and athleticism define women as male. In the context of athletics, these answers encourage a more inclusive and diverse interpretation of femininity while challenging societal expectations of women's bodies.

Representation of female athletes in Pakistani media

A recurring trend in how female athletes are portrayed in Pakistani media is revealed by interviews with female athletes from various sports. The athletes voice their dissatisfaction and irritation with the lack of media attention and female athletes. They draw attention to how frequently female athletes are portrayed as regular people, failing to acknowledge their unique traits, commitment, and accomplishments.

The players stress that it is difficult for female athletes in Pakistan to be accepted and recognized. They believe the media emphasizes their looks and femininity more than their physical prowess and accomplishments, focusing more on stereotypically feminine issues. The way women are portrayed in the media often sexualizes them in sports, promoting the idea that female athletes must meet conventional beauty standards to be covered and recognized.

The athletes also talk about the social pressure they experience, which includes cultural and religious aspects. They explain how society's standards and expectations about femininity, body image, and traditional gender roles might influence their actions and sense of who they are. However, many athletes demonstrate their tenacity and resolve to follow their passion for sports despite societal constraints.

"As a viewer I feel very happy if I see the coverage of female sports. Because it is such a happy moment to see any other sport getting coverage other than cricket." (Interviewee 4)

"We don't have such channels that show the coverage of different sports. I have seen kids in my family they want to play football, tennis and other sports it is what they see on YouTube. We don't have any coverage of any sport other than cricket now they are bored of cricket they want to see other sports and play some other sport so now it's changing. It all depends on what you see." (Interviewee 6)

There is a severe problem with the need for more coverage and portrayal of female athletes in Pakistani media. The need for more platforms, outlets, and coverage of women's sports in the nation is mentioned by athletes. They think media coverage is essential for developing young people's role models and motivating them to engage in sports. The athletes wish for more media attention to highlight female athletes' accomplishments and promote women's sports.

E.g., LeBron James is a basketball player he motivates the youth who doesn't have anything to do with basketball his work ethics, how he became what he became it something you look up to if we could bring stories like this in Pakistan, we can motivate youth on other level. We have people like that, we have athletes like that but we don't have a shining light on them." (Interviewee 8)

Overall, the athletes' experiences show how important it is for female athletes to be represented fairly and inclusively in Pakistani media. They stress the value of celebrating women's athletic accomplishments and abilities rather than concentrating on their beauty or adhering to conventional norms. By defying social norms and advancing gender equality in sports, more media attention and platforms for women in athletics may inspire and empower the next generation.

Female athletes as ordinary women

The athletes discussed their opinions on how Pakistani society and the media portray female athletes as regular people in the interview. They think that ordinary women and female athletes' confidence, personalities, and exposure to varied situations are distinct. They also point out that only a few female athletes from different sports receive media attention, which shows that more women should be represented in sports.

The female athletes admit the pressure regarding their weight but clarifies that she is more worried about other athletes' views than the general publics. She claims that physically appealing female athletes who fit the conventional feminine image typically receive more coverage from the media. However, she points out that just a few athletes are affected by this.

Female athletes are very confident they have a different personality the way they talk, they get to meet different people they have the exposure to many things as compare to the ordinary women. We have a very few female athletes of different games which are shown" NO WHERE" I don't know why." (Interviewee 4)

Regarding socioeconomic and cultural constraints, the athletes discuss how their family pushed them to follow social norms by dressing in a gown during training to appease onlookers. They emphasize, however, that they have never experienced any pressure from their religion.

The athletes state their opinion that relatively few sports, especially for women, are socially acceptable in Pakistani society. They think media is essential for developing positive role models for children and promoting sports as a positive force.

The athletes talk about their body image and say that does not worry about getting too muscular because they thinks having muscles helps them perform better in sports. They acknowledge, however, that some girls might not enjoy having muscles and that societal expectations and views affect how people view sportswomen.

The athletes believe that, in comparison to regular women, sportswomen are underappreciated in society. They think only those with first-hand knowledge or a deep comprehension of sports can genuinely appreciate their significance.

The conversation concludes by highlighting the athlete's views on the issue of female athletes in Pakistan being regular women. They think that compared to other women, female athletes have unique talents and face particular problems. According to the athletes, female athletes in Pakistan need more visibility and recognition, drawing attention to the limited media coverage and social pressures they encounter.

Long term Effects on body

The issue of long-term impacts on the body of female athletes in Pakistan is evident in the context of the interviews. Many athletes worry about possible long-term harm to their health brought on by their involvement in sports. They emphasize the significance of adequate training and taking care of their bodies to limit the danger of long-term injury while acknowledging that accidents and physical strains are inevitable in sports.

Despite these worries, the athletes show a solid and unwavering attitude while concentrating on their love

for their sports. They aspire to pursue their athletic objectives and achieve success in their chosen industries, and they feel that any short-term discomfort is worth it in the long run. They provide examples of athletes who have successfully recovered from injuries and returned to their sports, showing the significance of perseverance and commitment in overcoming challenges.

These athletes also understand the importance of maintaining a healthy balance between physical fitness and well-being. They know that their bodies are their tools for athletic success and that maintaining their health will allow them to perform at their best. They strongly emphasize the value of exercise, a healthy diet, and general fitness to maintain peak physical condition and avoid long-term harm.

"I don't think you sports can ever get you any damage. We say that people should do sports to stay active and healthy. It helps you in getting better health, strong heart, and good immunity and builds muscles to stay in better shape when you get older. If you take any bad substances or drugs that can damage your body" (interviewee 6)

"Yes, I have got two knee surgeries and my ankle has arthritis and literally I am just 26 and all of these things have come up I do dread the upcoming time but that doesn't mean it is going stop me" (Interviewee 8)

"Yes, kind of to me my skin it has become dark. But it's my passion so it doesn't matter for me sport is needed for everyone." (Interviewee 7)

It is crucial to realize that the athletes' views on long-term repercussions differ. Athletes who have already undergone knee surgery or developed arthritis at a young age express concerns about potential repercussions. On the other hand, some athletes have a more upbeat view and believe that long-term harm may occur if intended. Therefore, they place more importance on keeping their health and love for the sport. The overall subject of long-term consequences on the body highlights the physical difficulties and worries Pakistani female athletes endure. These athletes are motivated by their love and desire to excel even when they know the potential risks inherent in their activity. Their stories demonstrate the tenacity and commitment needed to pursue athletic careers while juggling societal expectations and cultural conventions.

DISCUSSION

The recent research findings of a hypothesis, which gives further insight in context with other researches that are done on the similar topic. This research inspected the perception of female athletes of Pakistan on body image and the representation in media so the findings show that there is no representation of female athletes in Pakistan it has been clearly stated in the interviews conducted with the participants that the coverage is very low. Whereas sports have been dominated by males for years which is why all the media coverage goes to them in Pakistan because even our society is not used to seeing females in sports. It mainly happens in a few counties that follow the patriarchal system specifically found in South Asians are the ones who face such issues.

Female athletes face several different issues when they go through the process of becoming professional athletes. The media plays a huge role in affecting the body image of female athletes. We have had this mindset that the female athletes on field playing any sport should be slim and fit. Media fortifies a certain message which individuals frequently think of which is healthy and better way of life. For men it is being muscular having huge muscles and for women's it is the attempt to keep an ideal and thin body.

The researcher found out that the body image dissatisfactions come from media (print or electronic) and when a person starts a social comparison (Franzoi & Klaiber, 2007). Looking at the fit ideal body of a sports model which is not even real in the real world the comparison of one self to the model begins which causes body image dissatisfaction whereas if we talk about the real world the female athletes not all of them are lean, they have maintained a specific body type for their sport it could be muscular or it could be lean.

Every sport needs a different kind of training and a different kind of body for instance if you are playing rugby or basketball you need to have strong arms and shoulders whereas if you are playing football or table tennis you need strong leg muscles so that clarifies the body image of a female athlete varies from one sport to other. The whole process should be shown to the society and make them understand if the female athlete has manly body so that is the requirement of her sport it's not something for fun it requires a lot of efforts to get such body and people just start calling the athlete with names and just want to make her life miserable that's all they want.

Most of the researcher has shown that the physical activity has various different health benefits on athletes. Female athletes can be profited with the positive health benefits from the sports participation. But of course, there are risks involved in other ways the culture of sports comes with many rewards but nothing comes without any dangers. In a demesne where the physicality and the physique are so essential to one's enactment, it is not unforeseen that sportspersons are vulnerable to higgledy-piggledy opinions,

state of mind and performances connected to nourishment, workout and the physique, which leads to body image issues (Hassan et al, 2023; Hausenblas & Fallon, 2006). These trials are propagated in sporty ethos, with trainers and mentors often assertive extreme bodybuilding/workout and slimming comportments. Unfortunately, the discrete physique, cognizance and forthcoming of an athlete is miserably at risk and is very rarely appreciated concluded their healthy triumph.

Woman sports persons in Pakistan are vulnerable to get affected by the issues like socio-cultural, body shaming, recognition, peer pressure, and television coverage. Habitually women are judged on the basis of their aesthetic and physical presence to an advanced level than males. This is predominantly the same in leisure. Even though feminine athlete's bodies are severely judged as soon as their physique type or make-up unswervingly connects with their healthy accomplishment. The scarcity of visible and successful female athletes as role models makes it challenging for aspiring female athletes to find inspiration and guidance. The absence of prominent figures in the sporting world can discourage girls from pursuing sports as a viable career option. Cultural expectations regarding modesty and dress code can pose challenges for female athletes.

Finding appropriate sports attire that adheres to cultural norms can be difficult, and conservative dress requirements can limit participation in certain sports. The female athletes who are muscular are adjudicated and termed "manly" despite the fact that the muscles help them in performing well in the precise diversion. Although our physiques are implausible apparatuses that support these females in attaining their goals, their worth is diminished, undervalued, and used as a strut rather than an implement.

Also, a surge in strength and control improves persons' capabilities to achieve their daily dealings (explicitly physical activities) and this may subsidize to their accomplishment. Conversely, for everyone, perfection of physical variables is more perceptible than mental variables such as level of apprehension, self-assurance or contentment with body image. For instance, satisfaction sensed by a person as an outcome of the augmentation of power in the preliminary weeks of the strengthening platform is more satisfying and vibrant than other perceptual variations. Hence, this satisfying feeling certainly progresses in people's happiness with their body image. Another reason is the surge of the level of self-worth (Sabiston et al., 2020).

CONCLUSION

The research intended to find out the perceptions of the female athletes of Pakistan. Interviews were conducted to attain in-depth results of the objectives set for the study. The results helped in summarizing that the female athletes of Pakistan don't get coverage from media. The total coverage they get is just a ticker in a news headline and the media has created a certain mindset of society related to female athletes which is pretty lean, fit & slim. Society often imposes narrow beauty standards on women, emphasizing a lean and feminine body type. Female athletes with more muscular bodies may face criticism, body shaming, or pressure to conform to traditional beauty ideals. In other words, female athletes are not recognized in Pakistan there are very few female athletes who are known. Deep-rooted gender stereotypes perceive sports as a masculine domain. There is a prevailing belief that women should prioritize domestic responsibilities over sports, leading to limited support and opportunities for female athletes. Female athletes often encounter resistance and lack of acceptance from their families, communities, and society at large. Traditional cultural norms and conservative attitudes can discourage girls and women from pursuing sports. Female athletes with muscular bodies may encounter stereotypes and assumptions that question their femininity or sexual orientation. These stereotypes can lead to discrimination, prejudice, or limited opportunities in sports or other areas of life. The only thing female athletes want is that they should be judged on their performance, not on their physical appearance. The coaches, trainers and the competitors should judge them as a person not as an object.

The findings of the study are concerning yet expected and any person can seek happiness and be successful and cherish any type of moment weather it is a competing event or not. It is important to note that having a muscular body is a natural outcome of intense physical training and is not inherently "manly" or undesirable. It is essential to challenge societal beauty standards and celebrate diverse body types among female athletes. A female living in an athletic body should not feel they are risking their self-view or body image or that they need to risk their health to participate in the sport they love and lives for. The media focuses on diverse features of female athletes constraining to male athletes. Still, it has also been examined that the media coverage of female athletes is poorer in quality, and very low in quantity.

DECLARATION

Authors' Contribution Statement: Ali Ab Ul Hassan led the conceptualization, methodology development, and data curation efforts, while also preparing the original draft of the manuscript. Sakha Maryam contributed significantly through validation, formal analysis, investigation, and rigorous review and editing of the manuscript. Muhammad Zia was responsible

for resources and data analysis.

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Effects of Aerobic Strength Training on Physical Fitness and Weight Loss of Female University Students

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ABSTRACT

There is still a growing global trend of physical inactivity despite several research showing the positive effects of exercise on health. Furthermore, the most effective weight-loss or weight-control approach is still in debate. The literature has proven that suggested aerobic strength training (AST) enhances a variety of physical performance outcomes in sports, which helps to validate the effectiveness of AST on physical fitness and weight reduction. Even though AST is one of the most popular strength training techniques, more research is needed to fully understand how it affects female university students' ability to lose weight and perform physically. The purpose of this study was to test the impact of 8 weeks of aerobic strength exercises in female students for physical fitness and weight loss. The study sample comprised overall female students of the Islamia University of Bahawalpur (Baghdad-ul-jaded Campus). The participants of the study were (n = 30) females with ages between (M = 25.45; SD = 30.58 years) were divided into two groups: The experimental group (EG; n=15), and the control group (CG; n=15). Prior to and after the intervention, participants experienced physical and anthropometric measurements. Data were analysed by applying descriptive, paired sample t-test, and independent t-test. Only a significant improvement for Left Hand Grip Strength (LHGS) (p = 0.05), agility (p = 0.00), flexibility (p = 0.01), skipping (p = 0.01), 30-m Shuttle Run Test (p = 0.00) were found in all physical fitness parameters and participants significantly losing weight for the EG (p<0.05) as compared to the control group. The findings suggest that AST improves female students' physical fitness and helps to reduce weight.

Keywords: *Aerobic fitness, cardio respiratory exercise, Obesity, Slenderize*

INTRODUCTION

Aerobic training is often known as Cardiovascular exercise, is a form of exercise that involves long duration exercise which increases heart rate and breathing rate, use of repetitive major groups of muscle, including arms, and legs (Garber et al., 2011). The heart and lungs are increased ability by this form of exercise. Further helps in weight reduction and physical fitness. Running, sit ups, jumping jacks, jump rope and walking are a few exercises that are considered aerobic (Reddy, 2012). Strength training is an exercise that increase the muscular growth, strength, and endurance which often referred to as strength or weight training (Reddy, 2012). In order to generate the required strength for muscular contraction with light weights, exercise machines, resistance bands, or bodyweight exercises (Hunter et al., 2008). Faced with threats of a sedentary lifestyle, it looks like physical activity plays an important role in females' daily life routines (Görner & Reineke, 2020). By reducing obesity and strengthening bones, joints, and the heart, it lowers the risk of cardiovascular disease (Hiruntrakul et al., 2011). Physical exercise can take the form of fitness or health training, which enhances the body's important functions while enhancing person's mental and physical fitness. Women who exercised both aerobic and strength-training activities loss more fat and weight compared to those who exercised only aerobic (Hunter et al., 2008).

When combined with aerobic strength training it can help you lose weight (Lucotti et al., 2011). Individuals can lose weight by increasing their energy expenditure and burning calories by engaging in aerobic activity. Strength exercise may also support muscle growth and maintenance, which increases calorie burn (Skrypnik et al., 2015). The recommendation of exploration of individual differences in fitness level, body composition, and other factors may affect the effectiveness of aerobic strength training for female university students. However, this recommendation could help to determine the most effective type of exercise program for female university students looking to improve their physical fitness and promote

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weight loss. Sloan et al. (2021) investigated the effects of aerobic exercise on young, sedentary individuals with cardiac reactivity to and retrieval from psychosocial and orthostatic stresses, finding that conditioning improved aerobic capacity while deconditioning lowered it, with 47 participants randomized into three groups: control, resistance exercise, or combined exercise (aerobic and resistance exercise).

Kim et al. (2018) examined the impact of a six-week program of resistance and aerobic exercise utilizing outdoor exercise equipment on the fitness and insulin resistance among Korean adults and found that the combined exercise training was not only beneficial for enhancing fitness but also manifested a significant decrease in insulin. Said et al., (2017) compared the impact of two different modalities of exercises and reported that aerobic and strength training improved body composition, physical fitness in overweight and obese females.it was also reported that low impact aerobics strength training method is more appropriate when the improvement of aerobic fitness and muscle strength is claimed. Muhammad et al. (2021) examined the impact of food and aerobic and strength exercises on pro-inflammatory marker alterations in obese adult females and concluded that programs for losing weight were linked to more inflammation.

Moreover, a combination of low-calorie diet and exercise did not offer premenopausal women with excess weight a larger advantage in lowering inflammation than low calorie diet alone. Kennedy's original set point model for the control of body fat. Kennedy was one of the founders in the idea that body fat storage might be a controlled process with a set point (Kennedy, 1953). He theorized that fat may generate a signal that is detected by the brain and compares with a goal amount of body fatness. Furthermore, consistent with the model's projections, extensive research has demonstrated that changes in leptin levels, whether brought on by weight gain or loss or brought on by peripheral or central administration, have a direct impact on eating behavior and energy consumption (Fam et al., 2007; Sousa et al., 2009). Kim et al. (2016) investigate the influence of strength and aerobic exercise on body composition in obese adults. Reported that body fat was significantly reduced in both groups' exercises.

However, it was manifested that strength exercise significantly preserved lean tissue relative to either aerobic exercise or no exercise in dieting obese subjects. It seems that the relative efficiency of aerobic strength training in the improvement of an inactive individual fitness and weight loss does not appear to have been settled upon by researchers. It seems probable that the variation in the results of past studies appears to have resulted from various session durations, or different approaches to training (i.e., training load, magnitude, and activities). Therefore, it was hypothesized that there is no significant impact of aerobic strength training on physical fitness and weight loss of female university students. It was also hypothesized that there is no significant difference between aerobic and strength training programs in fitness parameters. Finally, in order to promote physical fitness in obese inactive students, this paper examines the relationship between aerobic strength training and the physical fitness of female university students. The objective of this study was to identify the variables that contribute to obesity and inactivity among university-age girls, as well as the impact of 8 weeks of aerobic strength training on their physical fitness.

MATERIALS & METHODS

This is an experimental research design. Purposively, more than 60 non-exercising obese students volunteered to participate in this study, but 30 healthy female's students were randomly chosen from The Islamia University of Bahawalpur (Baghdad-ul-jaded Campus), Pakistan. The participants of the study were randomly divided into two groups. Subjects were assigned to an aerobic strength training group (AST) (N = 15, age 25.45 ± 30.58 years, height 162.99 ± 7.68 cm, body mass 69.61 ± 5.03 kg) and a control group (N = 15, age 26.20 ± 29.71 years, height 158.47 ± 5.53 cm, body mass 65.84 ± 8.51 kg). Criteria for inclusion for this study was only female students were chosen for this study. The participants in the research were untrained, free of injuries and not involved in any aerobic strength training at the time. Throughout the experiment, all participants committed to maintaining their current fitness routines. Participants were also instructed to maintain eating as usual during the workout session. Criteria for exclusion from the research included participating in extracurricular athletics outside of the university, engaging in physical activity more than once a week, and following a hypocaloric diet to lose weight. Furthermore, the presence of any medical records and a self-reported condition that might threaten their health. All participants were fully informed of the objective and process of data collection. All participants provided written informed consent to assure their volitional and active involvement in the study. The ethics board at Islamia University of Bahawalpur gave approval to this study (under project 833/PESS, March 2023).

Instruments and Equipment's of Data Collection

This study uses two different variables the anthropometric and physical fitness of the subjects for data collection. Six stations were organizing the anthropometric measurements.

The anthropometric measures taken from the participants included eight skinfolds, height, body mass (weight), eight body girths, seven body lengths, and hand grip strength tests. Physical fitness tests were taken as aerobic capacity, muscular power, flexibility, agility, 30-meter sprint, skipping rope, sit up.

Anthropometric Data Processing Process

This study examined the anthropometric measurements of subjects. Direct observation was employed as a research approach for this study. Ratio of fat to lean body mass. Both total and visceral fat were measured.

- Measurements of skinfolds. Eight skinfolds and measurements were taken from the triceps, subscapular, biceps, iliac-crest, supraspinal, abdomen, frontal thigh, and medial calf. Harpenden caliper (Holtain Ltd, Crosswell, Crymch, UK) was used for the measurements of skinfolds with 0.2 millimeter(mm) as a minimum reading model by ensuring that the surfaces of the two sides of the skinfold were parallel.

- Height was measured with stadiometer (Holtain Ltd., Crymych, Dyfed, UK). The subjects were instructed to stand straight and barefoot on the stadiometer. The stadiometer horizontal bar was set on the subject's vertex, and measurements were taken in centimeters (Koley, 2011).

- Body mass (weight). was determined using a digital weight machine (Seiko, Tokyo, Japan), which was calibrated by setting the scale to zero. The subject was told to stand on the surface of the machine with their feet together, their weight distributed evenly between their left and right feet. The 0.1kg threshold was chosen as the minimal reading model (Kolic et al., 2020).

- Measurements of girth. All girths were measured using the cross-hand method, and the measurement was obtained by using a non-elastic metallic tape measure. Nine readings of girth were taken: Arm girth, maximum forearm, minimum wrist, maximum chest girth, minimum waist, maximum hip, maximum thigh, maximum calf. The 0.1 cm was used as a model for reading (Cook et al., 2021).

- Measurements of length and strength. A large sliding caliper (Lafayette Instruments Company, LTD, USA) was used to measure the lengths of body segments. Length variables were measured as Upper arm length, Forearm length, total arm length, Hand length, Upper leg length, Lower leg length and total leg length (Cook et al., 2021). Make sure the subject stands in a relaxed position. The investigator stood behind the subject while holding caliper with the right and left edges. The minimum reading model for all lengths was .01 centimeter (Lucotti et al., 2011). To evaluate muscular strength the right-hand grip strength (RHGS) and left-hand grip strength (LHGS) were tested using a Handgrip Dynamometer. The subjects were told about the manner of their performance and measurement before performing individual tests.

Physical Fitness Tests

Aerobic capacity was measured through the Harvard Step test (HST). The subject goes up on 20-inch platform with both feet completely and then quickly steps down again, one foot at a time and repeated 30 times per minute for 5 minutes (Ibikunle & VS, 2016). Three trials of the standing broad jump (SBJ) were used to test the leg strength of the participants. The starting line was established, and the range between it and the rearmost heel strike were measured. The three trials' top score was recorded (Koch et al., 2003).

Flexibility was measured through sit and reach test. The score is determined with the last line reached if it seems that the reach is exactly halfway across two lines (French et al., 2016). Agility was measured through the 'T-test agility test'. Pointers are placed 10 meters, 5 meters, and 5 meters away from a line drawn on the ground to make a "T". The fastest time was collected after each participant made two maximal tries. Running 30 meters on the track is required for the test. A Stopwatch was used to measure the time. They are instructed to sprint as quickly as possible (French et al., 2016). All the participants were asked to perform as many successful skips as possible in one minute. Each time they jump, they will need to maintain a slight downward toe point (Tse et al., 2017).

Aerobic Strength Training Protocol Procedure

Collected pre-test data and later on post-test data was recorded. The training was performed for 8 weeks. Before exercise 30 subjects were done 5 to 10 minutes of warm-up. Each exercise had 2-3 min of rest. A wide variety of aerobic strength exercises were performed by the aerobic strength training group over an 8-week training program in order to improve physical fitness and lose weight (Table 1), in contrast to the control group, who did not engage in any aerobic strength exercises, (r) is repetition, while (s) is time in seconds.

Table 1. Aerobic strength training program of the experimental group, respectively.

S. No.	Exercises	Mon	Tue	Wed	Thu	Fri	(Set)
1	Sit Ups	10r		20r		30r	1
2	Push Ups		10r		10r		1
3	Squats	15r		20r		25r	1
4	Lunges		15r		20r		1
5	Walking Lunges	15r		20r		25r	1
6	Jumping Jacks		20r		30r		1
7	High Knee	10r		15r		20r	1
8	Crunches		10r		15r		1
9	Planks	20s		30s		40s	1

Warm-up, intervention, and cool-down exercises were done for 60 minutes, five days a week, with two days off during an eight-week aerobic strength training program (Sporer & Wenger, 2003; Sung, Son, Baek, & Kim, 2022). The warm-up activity section comprised 10 minutes of a combination of stretches, side steps, static walks, jogging in place, and arm swings. The primary workout was an aerobic strength exercises that included jumping jacks, high knees, planks, crunches, walking lunges, lunges, squats, sit-ups, and push-ups for forty minutes. The cool down workout included 10 minutes of brisk walking, dynamic stretching, deep and relaxing breathing. The control group did not follow the exercise routine. The exercise program took place between March to May 2023, for 08 weeks.

Statistical Analysis

The collected data was entered into data sheet of SPSS software for analysis. Descriptive statistics mean and standard deviation were used for anthropometry variable height and weight ratio, physical fitness, and health variables for analysis. The means of the pre-and post-tests for the experimental and control groups are compared in order to illustrate the results. They were conducted by using the independent t-test and the paired sample t-test to evaluate the effects of aerobic strength training as intervention. The statistical package of social sciences (SPSS) was used. Significant level of all variables is ($p < 0.05$).

RESULTS

Table 2 gives the mean (±standard deviations) for the experimental and control data tests of the groups for each of the nine tests. One of the main contributors to obesity and chronic illnesses like cardio vascular diseases are due to the lack of physical activity. Present study's results are quite positive and show how aerobic strength training may help sedentary female students lose weight and improve their physical fitness. Present study results shows that in skinfold measurements supraspinal 0.05*, biceps 0.05*, iliac crest 0.01*, abdominal 0.04* was significantly difference in experimental group as compared to control group. It was also observed that there was a significant difference in the arm girth 0.04*, forearm girth 0.04*, wrist 0.04*, chest 0.05*, waist 0.00*, hip 0.04*, thigh 0.00*, and calf girth 0.01* after eight weeks of AST training. Breadth measurements result shows that hip breadth 0.00* and chest breadth 0.04* significantly different in experimental group post data after eight weeks of aerobic strength training. Body mass of female 0.05* were significantly loss in experimental group after 8 weeks of aerobic strength training as compared to control group. Table 2 presents more detailed results of the covariance analysis (Table 2).

Table 2. Test results from the experimental and control groups before and after the intervention among study participants.

	Pre- Data				Post- Data					
	Experimental		Control		Experimental		Control			
Variables	**Mean**	**SD**	**Mean**	**SD**	**Mean**	**SD**	**Mean**	**SD**	**F**	**Sig**
Harvard step test(min)	151.53	13.1	132.27	10.34	113.2	8.35	127.8	10.51	0.39	0.538
Standing broad jump(cm)	100.07	17.31	100.2	14.72	111.73	16.43	101.13	13.9	0.847	0.365
Flexibility(cm)	25.07	2.91	24.67	3.68	31.73	3.65	25.53	3.66	6.792	0.015*
Agility(sec)	23.73	3.55	17.9	2.81	17.88	1.62	17.35	2.31	11.937	0.002*
30m Shuttle run test(sec)	13.32	1.87	10.1	1.45	10.6	1.43	9.83	1.46	12.612	0.001*
Skipping(m)	81	14.65	69.8	17.57	93.2	13.25	73.53	19.03	6.793	0.014*
Sit ups(m)	15.67	1.88	17.33	2.35	22.27	2.02	18.73	2.02	1.571	0.22
left hand grip strength(kg)	23.73	2.78	22.89	2.62	26.42	2.71	23.45	4.7	4.163	0.051*
Right hand grip strength	23.94	4.81	27.36	3.72	29.4	2.91	27.9	3.67	0.492	0.343

After considering each group's mean values for body mass and physical fitness, the analysis of results revealed a statistically significant difference between the experimental and control groups. In Table 2, When controlling for differences between pre-and post-tests, the findings show that aerobic strength training (AST) had a significant group impact on the physical fitness and weight reduction of female university students. The results showed a significant group effect on agility (p=0.00), flexibility (p=0.01), skipping (p=0.01), and LHGS (p=0.05), 30m Shuttle run test (SRT) (p=0.00) and experimental group was more capable of helping female university students lose weight than the control group in post-data. Additionally, in Table 2 of the study data, the sit-ups test, RHGS, HST, SBJ test showed no significant difference after eight weeks of AST program. A previous study outcome (Görner & Reineke, 2020) supported by current research. Physical fitness results showed that Harvard step test was used to measure aerobic capacity. SBJ was significantly enhanced after eight weeks of training. The current study was in line with the research done by previous researcher that AST has significant effects on flexibility (Dieli-Conwright et al., 2018). Eight weeks of AST had significantly enhanced LHGS (Sung et al., 2022). The findings of the previous studies (Nayasista et al., 2022) are supported by the results of the current investigation. Results from the control group's pre- and post-tests showed no significant changes in these variables (Table 2).

DISCUSSION

The purpose of the study was to examine the effects of aerobic strength training (AST) on physical fitness and weight loss of female university students. According to the authors' knowledge, this is the first study to look at how aerobic strength training affects weight loss and physical fitness levels among sedentary female students who are still quite young. The key findings of this study revealed that an 8-week AST program significantly increased the physical fitness of female university students and also helped them lose weight. These results corroborate the hypothesis that aerobic strength training induces both anthropometrics and physical fitness improvements. After 8-weeks of the AST program, a larger effect size of the change in weight reduction was seen for the experimental group only. However, the AST program had a significantly greater relationship with anthropometric measurements at the completion of the intervention.

The anthropometric measurements were lesser in the experimental group than in the control group after 8 weeks of AST program. The present study supports the findings of the previous study, of Miller et al. (2018) where the authors noticed improvements in physical fitness and lean mass following a 6- or 4-week aerobic exercise intervention phase. Thus, the Players therefore have superior health than the average person. Another previous study Sigal et al. (2014) finds the significantly decrease fat percentage in experimental group. Our results also confirms that through regular cardiovascular activity, AST burns calories and lowers total body fat. Biceps, iliac crest, abdominal fat were lesser in the experimental group as compared to the control group. The fat percentage was significantly decreased after 8-weeks of AST.

Current study supports the findings that similar results reduced the fat ratio in previous study (Burich et al., 2015). These findings indicate that both forms of training are efficient. Strength and aerobic exercise combined has a greater impact on weight reduction and enhances body composition (Mosher et al., 1994). However, aerobic activities put a greater emphasis on increasing cardiovascular fitness and calorie burning. They are not expressly meant to target muscle building or strength in the same way that resistance training (RT) is, despite the fact that they can assist reduce total body fat (Khammassi et al., 2018; Miller et al., 2018).

It is evident that aerobic exercise can increase calorie expenditure overall and aid in the loss of body fat (Said et al., 2017). Over time, this may cause girth measures to decline, especially in places where you are prone to storing extra fat. Strength training (ST) can help enhance muscle tone and definition in the desired regions even while it doesn't directly target fat loss. ST will help you gain muscle, which can make you seem more sculpted and perhaps change your girth measures (Sporer & Wenger, 2003). In our study, participants who engaged in AST reduced their body fat. However, we have to note that as you reduce your body fat, measures of your waist, hips, and thighs may also decrease which also supports the findings of previous study outcomes (Luglio et al., 2017). Additionally, this study assessed the effectiveness of including a variety of aerobic workouts and ST into your daily routine to assist fat reduction, muscular growth, and general fitness. More research is therefore required to evaluate the significance of physical fitness as a result of AST and how it influences weight reduction.

Previous study examined that the physical fitness was higher in experimental group after eight weeks of AST (Righi et al., 2022). The conducted research was similar effects on physical fitness of aerobic strength training as previously mentions (Görner & Reineke, 2020). In the present study we indicate that AST improves flexibility, agility, skipping, 30m SRT, muscular strength in LHGS, and with a mean impact that is both statistically significant and practically applicable. While there was no significant difference between the groups in the impact of AST on SBJ, RHGS, sit-ups, or HSJ over the pre- to post-intervention period, this result is likely the consequence of a lack of research using AST that focused on inactive individuals (Table 2). Taken together, the results of the current study lend support to previous studies (Kim & O'sullivan, 2013; Rodrigues et al., 2021), which found that combining AT and ST can increase muscle strength, especially among individuals who have been sedentary. Lifting weights or applying resistance to your muscles during strength training works them out. This results in stronger muscles and muscular adaptations over time (Muthiah & Lee, 2022).

Strength increases and improves total physical capability might result from combining the two forms of training. However, The conducted research supports the findings of previous studies of (Cohen et al., 2010; Dieli-Conwright et al., 2018) that, AT and ST can help with better movement control and general body coordination, which can enhance flexibility,30m shuttle run test and agility. The results of this study demonstrated that the null hypothesis was rejected because aerobic strength significantly influences female weight loss. From this vantage point, AST might be suggested as a powerful method of fitness to support the weight loss of inactive obese people. Considering the risks associated with a sedentary lifestyle, aerobic strength training appears essential for maintaining physical fitness and good health. It lowers the risk of cardiovascular disease, improves physical fitness, strengthens the heart, and joints, and aids in preventing obesity.

CONCLUSION

In this study, it was determined that aerobic strength training can be beneficial for people whose main goals are weight loss or changes in body composition. It was concluded that aerobic capacity significantly increased with both aerobic exercises alone and when paired with strength training that partially replaced the aerobic exercise. By incorporating aerobic strength training into their regular exercise routine, not just obese females but also young people can improve their physical fitness, lose weight, and improve their overall health and well-being. Future researcher's further grasp the impact of aerobic strength training on physical fitness and weight reduction in university females and create more effective programs to encourage healthy lifestyle habits by filling up these research gaps.

DECLARATION

Authors' Contribution Statement: Junaid Riaz contributed to the study's conceptualization and methodology design. Kai Ma led the project's overall coordination, including resources, data analysis, and the final manuscript's preparation. Nabila Sharif was responsible for data collection and formal analysis. Nerges Batool contributed to software development, validation, and visualization efforts. All authors have read and approved the final manuscript, ensuring its integrity and accuracy.

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Research Article

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Enhancing Basic Skills in Team Sports: A Video-Based Learning Approach in a Closed Facebook Group

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ABSTRACT

This study aimed to address the inconsistent availability of video demonstrations for basic skills in team sports (Baseball) by developing personalized video demonstrations and sharing them in a closed Facebook group. Conducted in the second semester of the 2021-2022 academic year, the study involved 50 Grade 11 students. An online survey gathered important background information, and a checklist was used to evaluate the intervention's accessibility, availability, and timeliness. Pre-tests and post-tests were administered to assess knowledge acquisition, while performance-based activities measured skill mastery. Frequency distribution and measures of central tendency described the data, and a t-test determined the significant difference between pre-test and post-test scores. The findings indicate that the intervention provided accessible, timely resources, enhancing students' knowledge acquisition and mastery of skills. The study concludes that personalized video demonstrations in the closed Facebook group effectively addressed the inconsistency and inconvenience of up-to-date video demonstrations for basic baseball skills.

Keywords: *Audio-Visual Learners, Individualized Learning, Skill Acquisition, Virtual Reality*

INTRODUCTION

Information that was once only understood by scholars and professionals can now be accessed by anyone, anywhere, in this information era. As our world becomes increasingly digitalized, individualized learning is becoming more accepted and easier to implement.

The challenges posed by the COVID-19 pandemic have highlighted inequities in digital access, showing that business as usual is not enough to ensure all children receive an education. The pandemic abruptly shifted the traditional educational system to virtual learning. Classrooms have turned into screened learning setups, with the digital world becoming the platform for fostering education and ensuring the convenience of accessing up-to-date information.

To bridge the digital divide in education and use technology to speed learning, alleviate learning poverty, and boost skill development, focus must be placed on bridging gaps in: i) digital infrastructure (connections, devices, and software); ii) human infrastructure (teacher capacity, student skills, and parental support); and iii) logistical and administrative mechanisms to deploy and maintain tech architecture (The World Bank, 2021). With the emergence of technology in education, Facebook (FB) has become one of the social media platforms used by teachers to manage instruction and learning. A study by Wang et al. (2012) found that most students were delighted with their Facebook learning experience.

As education evolves in the digital realm, students are becoming audio-visual learners. Hanzic (2021) stated that visual learning is eight times more effective than textual learning. Edgar Dale's cone of experience also indicates that learners likely retain 30% of information with the help of visual images. Visual learning aids in remembering information quickly and effectively. Teachers are becoming more creative in delivering lessons by integrating personalized videos to promote student-centered learning. Campbell and Cox (2018) found that personalized videos make students more flexible in generating, transmitting information, and learning. Additionally, they develop a sense of connection and work harder to ensure mutual understanding, fostering cooperation. Personalized videos offer numerous benefits, including easy access, the ability to pause and repeat, skip content, or review as needed. According to García-González et al. (2013), cognitive functions such as

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directing attention, visual behavior, anticipation, response selection, decision-making, and execution or performance are influenced by knowledge. The study of motor learning and control provides a comprehensive approach to understanding human movement. Skill acquisition is an interdisciplinary science involving neuroscience, physiology, psychology, biomechanics, and coaching to study how the neuromuscular system activates and coordinates muscles and limbs to perform motor skills. Jeong and So (2020) found that the sudden shift to online classes left teachers unprepared and struggling with unfamiliar teaching methods, leading to trial-and-error approaches. Inadequate online teaching strategies and low readiness for online classes made the transition difficult. Even with various content (YouTube, Internet materials, etc.), it took significant time and effort to find videos and materials that matched the teaching content of physical education classes. Participants' principal concerns about online physical education classes centered on the lack of efficient content and difficulties in using it. Their study recommended the availability of media to capture and edit various physical activity photos and videos for online course preparation.

The researcher observed that both teachers and students struggled to locate online resources for performance-based outputs. This observation led to the formulation of the research problem. This paper aimed to address the inconvenience and inconsistent availability of up-to-date video demonstrations on basic skills in team sports (Baseball) by developing personalized video demonstrations and posting them to a closed Facebook group to ensure the intellectual property rights of the teacher. Roomie (2020) claimed that it is nearly impossible to find a modern teen whose life is not impacted by Facebook. With almost 2.7 billion users, Facebook is the most powerful social media site to date. Many people, regardless of age, have accounts on this site, including students. Students use Facebook for various purposes, ranging from entertainment to education. Facebook helps students in many ways.

In this paper, the researcher addresses the challenges of the New Normal in education. This study seeks to answer the following questions:

Q1: How do personalized video demonstrations posted in a closed Facebook group benefit students in terms of: a) accessibility b) availability c) timeliness

Q2: How do personalized video demonstrations posted in a closed Facebook group affect students' learning in terms of: a) knowledge acquisition b) mastery of skills

MATERIAL & METHODS

Technology's rapid improvement and affordability have led many fields to adopt Virtual Reality (VR) to train real-world skills. This study addressed the lack of up-to-date video demonstrations on basic skills in team sports (Baseball) by developing personalized video demonstrations posted to Facebook.

Participants

Purposive sampling was used to identify participants. This method was chosen to access a particular subset of people fitting a specific profile (Jordan, 2021). The total population purposive sampling approach was utilized, selecting the complete population with specific characteristics (Laerd, 2012). The primary sources were Grade 11 students of MMSU-LHS (Laoag Campus) taking Physical Education with the topic, Team Sports. All students in the two sections participated. Secondary sources included books, journals, dissertations, online references, related literature, and studies.

Procedure

The researcher sent approval and intent letters to the school administration, students' parents, and participants. Informed consent was obtained to ensure ethical guidelines were followed (Salkind, 2010). A pre-test determined the learners' existing knowledge of Baseball. After the intervention, a post-test assessed knowledge acquisition, and a performance-based activity evaluated skill mastery. As Bhat (2021) shown importance of online data collection, an online survey gathered background information and evaluated the intervention's accessibility, availability, and timeliness. Pre-tests and post-tests assessed knowledge acquisition, and performance-based activities evaluated skill mastery.

Statistical Analysis

Quantitative data analysis was used to analyze the collected data. Descriptive analysis addressed the research questions, providing a meaningful way to present data (Laerd Statistics, 2018; Trochim, 2021). Frequency distribution and measures of central tendency described the survey data and performance scores, as it was also suggested by (Corporate Finance Institute, 2021). The weighted mean was computed to strengthen the reliability of findings. The t-test determined the significant difference between pre-test and post-test scores, further investigating the improvement in students' knowledge acquisition (Investopedia, 2020).

RESULTS

Accessibility of Resources

The sudden shift in the educational system has caused significant problems related to the inaccessibility of resources for both teachers and learners. Limited video demonstrations of basic skills available on the internet prompted the researcher to investigate the effectiveness and efficiency of personalized video demonstrations.

The mean scores in Table 1 indicate that participants were very satisfied with the accessibility of the personalized video demonstrations in the FB closed group, highlighting its convenience, availability, and reliability as a learning resource.

Availability of Resources

The Table 2 shows mean scores indicate that participants were very satisfied with the availability of the personalized video demonstrations in the FB closed group, highlighting its efficiency, portability, and effectiveness in providing resources.

Timeliness of Resources

The Table 3 presents the participants' satisfaction with the timeliness of personalized video demonstrations posted in the FB closed group. the mean scores indicate that participants were very satisfied with the timeliness of the personalized video demonstrations in the FB closed group, highlighting its effectiveness in providing current and accurate execution of basic skills.

Table 1. Mean Scores of the Accessibility of Resources

Indicator	Mean	Descriptive Interpretation
The personalized video demonstration posted in FB closed group provides more convenience rather than simply browsing the wide internet.	4.60	Very Satisfied
The personalized video demonstration posted in FB closed group is accessible any time.	4.76	Very Satisfied
The personalized video demonstration posted in FB closed group bridges the gaps in finding credible resources online.	4.78	Very Satisfied
The personalized video demonstration posted in FB closed group saves time for executing the basic skills rather than browsing the internet.	4.76	Very Satisfied
The personalized video demonstration posted in FB closed group provides an avenue in accessing reliable reference in the execution of the basic skills.	4.62	Very Satisfied
Composite Mean	4.70	Very Satisfied

Table 2. Mean Scores of the Availability of Resources

Indicator	Mean	Descriptive Interpretation
The personalized video demonstration posted in FB closed group minimizes time consumption in finding resources.	4.60	Very Satisfied
The personalized video demonstration posted in FB closed group is available and portable anywhere I go.	4.76	Very Satisfied
There are limited resources online that execute the different basic skills.	4.78	Very Satisfied
Composite Mean	4.75	Very Satisfied

Table 3. Mean Scores of Timeliness of Resources

Indicator	Mean	Descriptive Interpretation
The personalized video demonstration posted in FB closed group provides up-to-date execution of the basic skills.	4.68	Very Satisfied
The personalized video demonstration posted in FB closed group eradicates the wrong execution of the different basic skills posted in different media platforms.	4.76	Very Satisfied
Composite Mean	4.72	Very Satisfied

Acquisition of Knowledge

The researcher utilized personalized video demonstrations posted in the FB closed group as an intervention to boost learners' knowledge acquisition. Videos create opportunities for in-depth learning by presenting various data such as images, movement, and sound together. This allows learning to occur at individual paces and ensures control over the reception of information.

The table 4 presents the pre-test and post-test scores of the participants, highlighting the effectiveness of the personalized video demonstrations in enhancing knowledge acquisition. The mean scores indicate a significant improvement in participants' knowledge acquisition, as evidenced by the higher post-test scores compared to the pre-test scores. The p-value of 0.001* suggests that the difference between the pre-test and post-test scores is statistically significant.

Table 4. Pre-test and Posttest Scores of the Participants

	Mean	SD	Mean Difference	t-test	p-value
Pre-test	11.68	5.0376			
			0.37540	-17.3149	0.001*
Posttest	18.18	1.8676			

Mastery of Skills

The researcher utilized personalized video demonstrations posted in the FB closed group as an intervention to boost learners' mastery of skills. Through video practices, learners master real objects and movement sequences by observation, providing opportunities for in-depth learning.

The table 5 presents the performance task results of the participants, highlighting the effectiveness of the personalized video demonstrations in boosting the mastery of skills. The results indicate that all participants achieved a high degree of effectiveness in their performance tasks, demonstrating the positive impact of personalized video demonstrations on mastering the basic skills.

Table 5. Result of the Performance Task of the Participants

Range of Scores	Descriptive Interpretation	f	%
22 – 28	High Degree of Effectiveness	50	100
15 - 21	Considerable Effectiveness	-	-
8 - 14	Moderate Effectiveness	-	-
1 - 7	Limited Effectiveness	-	-
Summation of Scores		1290	100
		Mean: 25.8	

DISCUSSION

According to Levy (2007), growing trend is observed, especially in among youths to watch videos broadcasted in social networking sites (YouTube, Twitter, and Facebook) and to communicate via social networks. The results from Table 1 indicate that the personalized video demonstration posted in the FB closed group provided significant convenience for students compared to browsing the wide internet. With a weighted mean of 4.60, the students expressed being Very Satisfied. The videos were accessible anytime, with a weighted mean of 4.76, and bridged gaps in finding credible resources online, with a weighted mean of 4.78, both rated as Very Satisfied. Additionally, the videos saved time in executing basic skills rather than browsing the internet, with a weighted mean of 4.76, and provided reliable reference access with a weighted mean of 4.62. The composite mean of 4.70 confirms that the personalized video demonstration effectively provided accessibility

of resources to the study participants. As shown in Table 2, the personalized video demonstration minimized time consumption in finding resources, with a weighted mean of 4.60, rated as Very Satisfied. The videos were available and portable anywhere, with a weighted mean of 4.76, and were among the limited resources online executing basic skills, with a weighted mean of 4.78. The composite mean of 4.75 indicates that the personalized video demonstration effectively provided availability of resources to the participants.

Table 3 reveals that the personalized video demonstration provided up-to-date execution of basic skills, with a weighted mean of 4.68, rated as Very Satisfied. The videos also eradicated incorrect execution of basic skills found on other media platforms, with a weighted mean of 4.78, rated as Very Satisfied. The composite mean of 4.72 confirms that the personalized video demonstration effectively provided timely resources to the participants.

From Table 4, it is evident that there was an improvement in knowledge acquisition, as indicated by the increase in mean scores from the pre-test (11.68) to the post-test (18.18). The t-test value suggests a significant difference between pre-test and post-test mean scores at $\alpha=0.05$, confirming that the personalized video demonstration boosted participants' knowledge acquisition.

Lastly, Table 5 shows an improvement in skill mastery, with a mean score of 25.8. This indicates a High Degree of Effectiveness in executing the basic skills of Baseball. Thus, the personalized video demonstration effectively boosted participants' mastery of skills.

CONCLUSION

The personalized video demonstration posted in a Facebook closed group has proven to be an effective educational tool in enhancing the learning experience for students. The study revealed that the video demonstrations significantly improved the accessibility, availability, and timeliness of resources, providing students with a convenient and reliable reference for executing basic skills in baseball.

The intervention led to a notable increase in knowledge acquisition, as evidenced by the significant improvement in post-test scores compared to pre-test scores. Furthermore, the personalized video demonstrations facilitated a high degree of skill mastery, ensuring that students could accurately execute the basic skills of baseball.

Overall, the personalized video demonstrations not only addressed the challenges posed by the sudden shift in the educational system but also provided a modern and efficient way to support students' learning and skill development. This approach can be beneficial for educators looking to enhance their teaching methods and provide more engaging and accessible learning resources.

DECLARATION

Authors' Contribution Statement: Patrick John B. Roldan is the sole author of this paper and was responsible for the conceptualization, design, data collection, analysis, and writing of the manuscript.

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Research Article

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Alteration of Human Growth Hormones Associated with Moderate Intensity Exercises among Female Students

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ABSTRACT

The functions of Human Growth Harmons (HGH) include growth, metabolism, and healing, and its level may be influenced by exercise. Growth Hormones link the production of Insulin Growth Factor-1 (IGF-1) development by increasing the glucose level in athletes. This study aimed to examine the impact of moderate intensity on HGH levels among female students. An experimental research design was used in this study, female students were randomly selected, representing a diverse range of body types and baseline health statuses from Punjab University in Lahore. The participants were divided into the experimental group (EG) and the control group (CG). Every group consisted of ten (10) participants. Ethical approval was taken from the ethical review and research board at the University of the Punjab Lahore. Subjects of the experimental group (EG) were given Eight (08) weeks of exercise protocol 5 days per week 40 minutes per day will be applied to the participants of the study, which exercise program included walking, slow running, fast and then slow running Pre and posttest were gathered Human Growth Harmons (HGH) level. Pre and post-tests were managed through the statistical package for social sciences (SPSS-32), and appropriate statistical tests will be applied. Based on data analysis and findings, the researcher concluded that has a positive impact on HGH levels.

Keywords: *Exercise, Female Students, Human Growth hormones, Insulin Growth Factor*

INTRODUCTION

Exercise is becoming more popular for both competitive and recreational reasons since it has numerous advantages for the body and mind. Because it effects many of the endocrine systems that are closely connected with the homeostatic system, Interest in its immediate and long-term effects on hormones has increased. Reactions as well as hormonology implications for reactions to exercise (Galbo, 1981; Hackney & Lane., 2015; Hossain et al., 2014; Nagamatsu et al., 2014).

The Human Growth Harmone (HGH/insulin) growth factor level-I (HGH/IGF-I) axis is particularly relevant to these interactions for several reasons. This axis is first activated by exercise, which may aid the body in adapting to training. The second is the growing understanding of the HGH deficiency clinical condition and the corresponding decreased capacity for exercise. Third, in the mistaken belief that abusing HGH will improve performance, amateur athletes use it (de Boer, 1995; Macintyre, 1987; Reinecke, 2010). Numerous studies have demonstrated that HGH levels rise in response to acute exercise at a threshold level of about 30% VO_2 max (percentage of maximal oxygen absorption). Anaerobic exercise and hypoxia can cause levels to spike up to 100 times, depending on the type and degree of activity. Some research has found no effect, or even that nocturnal HGH release is attenuated, long-term exercise (greater than 4 hours) has been shown to increase the percentage of HGH released during the latter part of sleep. Exercise induces basal-like production of HG in kids who are pubertal as opposed to prepubertal (Alon et al., 1998; Beckwith, 2014; Pritzlaff, 2000).

There is a great deal of dispute on the fundamental causes of the HGH elevation brought on by exercise. The opiate antagonist naloxone acts to have the opposite result on athletes, reducing the HGH reaction. However, in untrained normal males, naloxone boosts the HGH reaction to vigorous exercise. These differences may be the result of long-term exercise-induced changes in neuroendocrine balance. Rather than an endogenous ligand like Growth hormone-releasing peptide-6 (GHRP-6), the ultimate mechanisms are probably Atropine, Pyridostigmine, and changes in GHRH release (Boisseau & Delamarche, 2000; Møller & Jørgensen, 2009; Takarada et al., 2000). Even though there is a large amount of

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literature HGH, there are still gaps and areas that require additional study. Further research is needed to determine safe and effective dosages for particular populations and circumstances, as well as to understand the mechanisms and long-term effects needed to understand how HGH interacts with other hormones like Insulin and cortisol and how it affects different physiological pathways. HGH may have anti-ageing properties, further studies are required to fully understand how HGH functions in the ageing process and how it affects age-related disorders and overall quality of life. By filling in these gaps, it is important to human the physiological functions of HGH and its possible therapeutic uses. The researcher can also assist ensure that HGH is used safely and effectively across a range of populations.

MATERIALS & METHODS

Research Design

In a brief period, the cross-sectional study investigates the relationship between exposures and outcomes. The evaluated correlations are regarded as hypothesis-generating and are supported by solid hypotheses. This style might be analytical or descriptive. In a cross-sectional study design, predetermined inclusion and exclusion criteria are used to select participants, and this selection process restricts randomization. By continually gathering data from the same participants over an extended period, longitudinal studies enable researchers to track changes or patterns within the same population and evaluate the causal connections between variables over time. Therefore keeping in view the need and demand of the study, in this research study the researcher adopted cross cross-sectional and longitudinal research design.

Participants of the study

The current study aimed to explore the risks and benefits of moderate-intensity exercise, investigating potential predictors' effects of moderate-intensity exercise in youth. This Cross-sectional and Longitudinal study was carried out among twenty (20) female student participants of the Sports sciences department from the University of Punjab Lahore, aged 18 to 22 years, which was divided into two groups (CG and EG). All subjects experienced HGH measurements and moderate-intensity exercise analysis for body composition parameters.

Collection of Blood Sample

Data is collected through the PHLEBOTOMY process. Twenty (20) participants voluntarily participated in the process, and data was collected through accurate methods devices and time. For the assessment of HGH, fifteen (15) ml of blood was collected from all subjects, through vein puncture, and a small amount of blood was collected into a test tube or vial. Each blood sample was marked with a separated identification code.

Blood Sampling and HGH immunoassay Analysis

Blood samples were collected for insulin-like growth factor (IGF-1) test by immunoassay analysis. Large series of samples can be readily and quickly evaluated using immunoassay analysis, which is a crucial feature for clinical laboratories considering the rising demand for HGH determination. The most common method for determining the amount of HGH in the blood is to utilize commercial immunoassay kits. When serum samples are measured using several immunoassay kits, the findings are wildly inconsistent. The details of the sample testing and its principles are given below. Firstly wear gloves, tie the tourniquet on the cubical vein collect the blood from the veins put it into a yellow tap vile and mention the name. Then to maintain the vile temperature put 2-8c ice pack in an isolation box to reach the lab. In the Lab start the centrifugation process at 1500-2000pm for 2-3min to separate serum and cells and then use the test proceeding technique Enzyme-Linked Immunosorbent ASSAY (ELISA). Chemiluminescence is an automated special chemistry technique of ELISA used in tests to give accurate results. Completing the centrifugation process vile putting the Chemiluminescence and chemical light pass out from solution and give absorbance.

Ethical Consideration

Before initiating the exercise intervention on the participants of EG, all the participants were made aware of the risks and benefits of participation in the study. Hence, all those participants who voluntarily participated and met the inclusion criteria were included in the study and then informed consent was taken from all the participants. Institutional permission was also obtained from the ethical and review board regarding the protocols of the study.

DATA ANALYSIS

After the exercise intervention, the results (pre- and post-test) were processed for analysis using suitable statistical tools (Mean (M), Standard deviation (SD), paired sample t-test, and independent sample t-test) through the application of statistical package for social sciences (SPSS, version 26).

This table 1 shows the mean and std. Values of HGH

levels for the experimental group before intervention. The $\bar{X}$ and std of EG in term of HGH was 2.77± 3.47.

Table 1. Pre-test data of EG in term HGH level

Pre-Intervention variable of EG	N	$\bar{X}$	Std.
HGH level	10	2.77	3.47

The table 2 shows the mean and std. Values of HGH levels for the experimental group after intervention. The $\bar{X}$ and std of EG in term of HGH was 5.79± 7.79.

Table 2. Post-test data of EG in term HGH level

Post intervention variable of EG	N	$\bar{X}$	Std.
HGH level	10	5.79	7.79

The table 3 shows the mean and std. Values of HGH level for the control group before intervention. The $\bar{X}$ and std of EG in term of HGH was 3.97± 3.85.

Table 3. Pre-test data of CG in term HGH level.

Pre-Intervention variable of CG	N	$\bar{X}$	Std.
HGH level	10	3.97	3.85

Table 4. Show the mean and std. Values of HGH levels for the control group before intervention. The $\bar{X}$ and std of EG in term of HGH was (2.31 2.11).

Table 4. Post-test data of CG in term HGH level

Post-Intervention variable of CG	N	$\bar{X}$	Std.
HGH level	10	2.31	2.11

The table 5 indicates the Comparison of the pre-test results of CG and EG (independent sample t-test). The values of HGH level of CG were (M =, 3.9730 SD = 3.85126) and EG (M = 2.77, SD = 3.47; $t_{(20)}$ = -0.733, p =0.81 > significant level = 0.05) thus no significant difference was observed in term of HGH in both CG and EG.

Table 5. Comparison of Pre-test of CG and EG (Independent sample t-test) in term of HGH

Variable (Pre-Intervention)	Group	N	$\bar{X}$	Std.	Df	t	Sig.
HGH level	CG	10	3.97	3.85	18	-0.73	0.81
	EG	10	2.77	3.47			

The table 6 indicates the Comparison of the pre- and Posttest of HGH of EG (Paired sample t-test). The values of HGH level of pre-test were (M = 2.77, SD = 3.47) and EG (M = 5.79, SD= 7.79); $t_{(20)}$ = --1.07, p =0.30 > significant level = 0.05) thus no statistical significance was observed in pre and posttest result of EG.

Table 6. Comparison of Pre and Posttest of EG (Paired sample t-test) in term of HGH

Variable (Pre-Intervention)	Group	N	$\bar{X}$	Std.	df	T	Sig.
HGH level	Pre	10	2.77	3.47	9	-1.07	0.30
	Post	10	5.79	7.79			

DISCUSSION

The main objective of the study is to analyze the impact he moderate-intensity exercise on HGH. The current study indicates that there is a significant (statistical) impact of moderate intensity on HGH levels. Such an emerging concept supported by (Paul Jenkins, 1998) shows that a number of the homeostatic systems that the endocrine system is intimately related to are affected by exercise.

In line with the current study, Exercise stimulates the release of HGH, leading researchers to investigate its potential as a clinical screening method for HGH insufficiency. In children with short stature, HGH deficiency was ruled out in 68% of patients with a 20 mU/L diagnostic criterion. However, when exercise was less strictly monitored, the results were found to be unreliable. (Lin & Tucci, 1974). It also promotes whole-body protein synthesis, which includes the synthesis of collagen and skeletal muscle proteins. Because the muscles Consume glucose and then non-esterified fatty acids (NEFA) as fuel throughout the metabolic reaction.

HGH is recognized as essential for female fertility. Women with HGH Deficiencies tend to have reduced fertility, but

HGH replacement therapy can improve their chances of conception (Alsat et al., 1998). While HGH plays a secondary role in regulating glucose and fat metabolism alongside catecholamine and insulin, the surge in HGH induced by exercise may be crucial for protein synthesis following exercise (Kraemer & Ratamess, 2005). HGH promotes muscle protein synthesis and prevents protein breakdown, which increases anabolism. Exercise volume and intensity have been linked to HGH concentrations. HGH raises IGF-I levels in the bloodstream. Since both hormones are important in the regulation of muscle mass, IGF-1 and HGH combined may be valuable indicators. In both men and women, luteinizing hormone is linked to reproductive function (Kraemer et al., 2020). In line with the present study, the study conducted by Raastad et al (2000) that the athletes engaged in one high-intensity and one moderate-intensity strength training session. When compared to the moderate-intensity regimen, the high-intensity approach produced more immediate reactions in terms of cortisol and testosterone. The acute HGH response does not significantly differ between the two strength regimes. Peake (2014) and Wahl et al (2010) found significantly higher after high-intensity intermittent exercise compared with continuous moderate-intensity.

CONCLUSION

In light of the analysis and findings, the researcher concluded that moderate-intensity exercise has a significant impact on HGH among female students which indicates various physiological benefits associated with HGH. Keeping in view the potential role of moderate-intensity exercise, it is suggested to make moderate-intensity exercise part of our routine activities.

DECLARATION

Authors' Contribution Statement: Umbar Saddique contributed to the study conceptualization and methodology design. Alamgir Khan led the overall coordination, including resources, data analysis, and the final manuscript preparation. Muhammad Zafar Iqbal Butt contributed to software development, validation, and visualization efforts. All authors have read and approved the final manuscript, ensuring its integrity and accuracy.

Ethical statement: This research adheres to the ethical guidelines established by the Committee on

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