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Gender-Differentiated Effects of Physical Education Programs on Health-Related Fitness Parameters

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Abstract: ***The present study was undertaken to evaluate the effect of 6 weeks physical education programme on health related fitness variable of male and female students. For this purpose 15 male and 15 female students of B.P.Ed. 1st year course at LNIPE, Gwalior were selected as subjects for the study. The Health Related Physical Fitness test consisted of Cardiovascular endurance, Muscular endurance, Muscular strength, Flexibility and body composition. The t-ratio was used as statistical measures to find out the significant effect of the physical education programme on the selected health related fitness variables of male and female subjects. The 6 weeks programme of physical education proved significant improvement of cardiovascular endurance, muscular endurance, muscular strength, flexibility and sum of skinfolds (triceps and calf) in case of both male and female subjects. Total body weight and fat weight showed significant decrease for both males and females.***

Keywords: Physical Education Programme, Health Related Fitness, Body Composition

1. Introduction

The Greek philosopher Plato articulated the following regarding physical education. “Their purpose is not to train the body, but rather the mind, albeit incidentally; they aim to ensure a proper harmony between energy and initiative on one side and reason on the other by achieving the correct balance.” Training in games and sports is no longer a fiction; it is a rigorous endeavor that offers opportunity for scientific methodology and validation. Training is recognized as a specialized discipline that employs scientific methodologies and empirical research. (Bucher, 1974).

The structured physical education program seeks to optimize the individual's potential across all life stages by immersing them in an environment that fosters movement and associated responses or activities conducive to this objective. In contemporary society, physical education is regarded as a form of "human engineering," primarily focusing on the physical characteristics of the human body, rather than the cerebral and sociological dimensions of existence. Consequently, physical educators must possess a comprehensive understanding of the body's physical functioning to optimize its utilization. Currently, in the domain of athletic training and high-performance sports, physical educators or coaches cannot achieve significant results without the application of contemporary scientific knowledge from relevant disciplines (Nixon & Jeett, 1974).

The effort has been made in this study to find out the beneficial effect of 6 weeks physical education programme on different category of students and hence, present study was conceptualized to analyze the physical education programme among male and female students on selected health related fitness variables, further It was hypothesized that there would be significant difference in the selected health related fitness variables of male and female students following the 6 weeks physical education programme.

2. Methodology

The current study involved 30 participants (15 male and 15 female) enrolled in the 1st year of a bachelor's degree program in physical education at LNIPE, Gwalior, with ages ranging from 17 to 21 years. All individuals willingly consented to participate in the testing method, and in accordance with the testing protocol, each test was thoroughly elucidated to them to eliminate any ambiguity regarding the efforts required on their side. No specific approach was employed to inspire the subjects to do their utmost effort; however, the subjects shown considerable maturity and engaged wholeheartedly in the testing. Keeping in mind the feasibility criteria and the purpose of the present investigation Health Related Physical Fitness Test Comprising following test items was adopted and the criterion measures for the present study were presented in table 1.

Table 1: Criterion Measure

S. No.	Test	Criterion Measures
1	Endurance Run	1 mile run.
2	Mascular Endurance	Flexed Knee sit ups in sixty seconds.
3	Mascular Strength	Pull ups/Modified pull ups
4	Flexibility	Sit and reach test (From sitting position)
5	Body composition	(sum of triceps and calf skinfolds)

The program comprised practical exercises in diverse sports disciplines during the morning and evening, and theoretical seminars throughout the day. The morning and evening sessions of practical classes comprise three periods (45 minutes each) dedicated to instruction and practice in several disciplines, along with specialized practice for an individual's chosen activity. In order to find out the difference between the pre-test and the post-test means of each group in selected variables, the ‘t’ ratio was employed. The level of significance was set at .05.

3. Findings

The statistical analysis pertaining to the t-ratio for the health related fitness variables were presented in Tables 2.

Table 2: T- Ratio of Male and Female Subjects on Cardiovascular Endurance Performance

Groups	Pre-test Means	Post-test Means	Dm	σDm	t-ratio
Male	431.43	404.40	32.67	6.46	3.70*
Female	585.30	547.32	46.37	6.45	5.60*

*Significant at 0.05 level, t-0 05 (29) = 2.04

Table 2 presents t-ratios of 3.70 and 5.60, respectively, indicating the significance of the difference between the pre-test and post-test averages of male and female subjects in cardiovascular endurance performance. The calculated t-ratios are significant as they exceed the t-value of 2.04 necessary for significance at the 0.05 level. The findings demonstrate a notable enhancement in cardiovascular endurance performance from pre-test to post-test for both male and female participants.

Table 3: T- Ratio of Male and Female Subjects on Muscular Endurance Performance

Groups	Pre-test Means	Post-test Means	Dm	σDm	t-ratio
Male	35.53	49.73	13.16	1.74	7.26*
Female	29.73	39.53	7.45	0.96	8.36*

* Significant at 0.05 level, t-0 05 (29) = 2.04

Table 3 illustrates the significant difference between the pre-test and post-test means of male and female subjects in muscular endurance performance, with t-ratios of 7.26 and 8.36, respectively. The findings demonstrate a notable enhancement in muscular endurance performance from pre-test to post-test for both male and female participants.

Table 4: T- Ratio of Male and Female Subjects on Muscular Strength Performance

Groups	Pre-test Means	Post-test Means	Dm	σDm	t-ratio
Male	6.67	9.97	5.60	1.61	9.24*
Female	5.17	8.63	4.63	1.50	6.85*

*Significant at 0.05 level, t-0 05 (29) = 2.04

Table 4 demonstrates the significant of the difference between the pre-test and post-test averages of male and female individuals in muscular strength performance, with t-ratios of 9.24 and 6.85, respectively. The calculated t-ratios are significant as they exceed the t-value of 2.04 necessary for significance at the 0.05 level. The findings demonstrate a notable enhancement in muscular strength performance from pre-test to post-test for both male and female participants.

Table 5: T- Ratio of Male and Female Subjects on Flexibility Performance

Groups	Pre-test Means	Post-test Means	Dm	σDm	t-ratio
Male	7.67	11.63	3.63	0.83	6.27*
Female	6.53	10.47	5.58	0.96	4.83*

*Significant at 0.05 level, t-0 05 (29) = 2.04

The table above illustrates the significant difference between the pre-test and post-test means of male and female individuals in flexibility performance, revealing t-ratios of 6.27 and 4.83, both significant at the 0.05 level. The findings demonstrate a notable enhancement in flexibility performance from pre-test to post-test for both male and female participants.

Table 6: T- Ratio of Male and Female Subjects on Body Composition (Sum of Triceps & Calf Skinfolds)

Groups	Pre-test Means	Post-test Means	Dm	σDm	t-ratio
Male	25.68	17.74	4.15	0.63	6.63*
Female	35.58	35.73	6.56	0.63	8.59*

* Significant at 0.05 level, t 0 05 (28) = 1.701

Table 6 demonstrates the significance of the difference between the pre-test and post-test averages of male and female subjects in body composition (sum of triceps and calf skinfolds), with t-ratios of 6.63 and 8.59, respectively. The calculated t-ratios are significant as they exceed the t-value of 2.04 necessary for significance at the 0.05 level. The aforementioned data demonstrate a substantial reduction in the aggregate of triceps and calf skinfolds from pre-test to post-test for both male and female participants.

4. Conclusion

The study's findings indicate the subsequent alterations in the chosen health-related physical fitness variables for male and female participants after the 6-week physical education program. The results demonstrate that both male and female participants exhibited significant improvement from pre-test to post-test across the Health Related Fitness Test variables, specifically cardiovascular endurance (one mile run), muscular endurance (sit-ups), muscular strength (pull-ups for males and modified pull-ups for females), flexibility (sit and reach), and body composition (sum of triceps and calf skinfolds).

In comparing pre- and post-test scores between male and female respondents on the aforementioned characteristics, it was determined that males exhibited significantly more improvement than females in cardiovascular endurance and muscular endurance. In terms of flexibility, females had a markedly superior improvement compared to males. No significant difference was noted in muscular strength and body composition (sum of triceps and calf skinfolds) between male and female respondents.

A meticulously structured physical education program elicits physiological alterations in nearly every bodily system. The advantageous benefits of a prolonged training regimen are significantly evident in the enhancement of motor skills. Consequently, it was evident that the participants in the current study exhibited substantial enhancement in physical fitness metrics after six weeks of engagement in a structured physical education program. Research conducted by Simpson and Priest has proven the beneficial impact of participation in physical activity on health-related physical fitness.

Ethical Approval

Ethical approval for this research was obtained from the concern Department of the Institute. Informed consent was obtained from all individual participants included in the study. Participation was voluntary, and data confidentiality and anonymity were strictly maintained throughout the research process.

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