COMPARISON OF SELECTED PHYSICAL VARIABLES OF PHYSICAL EDUCATION AND NON-PHYSICAL EDUCATION STUDENTS

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Abstract

The rationale for conducting a study comparing selected physical variables of Physical Education and Non-Physical Education students is to investigate the influence of Physical Education activities on college-level students in terms of their physical health.

Physical education is known to have an impact on physical and mental health. By comparing selected physical variables between physical education and non-physical education students, the study aims to understand whether engagement in physical education has any discernible effects on physical factors such as strength, endurance, flexibility, and speed.

60 male students were selected through systematic random sampling from the two populations of college students aged 22 to 25. Among the subjects, 30 came from the Physical Education stream (PEG), and the remaining 30 came from the non-physical education stream (NPEG) of General Degree Colleges in West Bengal.

After selecting the students, they were tested for Physical fitness data. Data from 60 subjects was collected by using different fitness tests to measure Speed (50m dash), Exclusive Strength (SBJ test), Endurance (600m run), and Flexibility (Sit and Reach test). Two-sample "t" test revealed significant difference exists between the means of strength, flexibility, and speed scores of the two groups

It can be concluded that students from Physical Education streams in general degree colleges of West Bengal generally show improved physical fitness compared to their non-Physical Education counterparts, as evidenced by their scores in strength, speed, and flexibility. However, Non-Physical Education students seem to possess the same endurance in comparison to students attached to Physical Education subjects at General Degree Colleges.

Keywords: Physical Variables, Physical Education, Non-Physical Education Students

Introduction

Substantiation indicates that including physical exertion and physical health can also additionally ameliorate instructional overall performance, and that point inside the academy day dedicated to recess, physical education classes, and physical exertion inside the study room may additionally grease instructional overall performance. Available substantiation indicates that arithmetic and analysis are the educational motifs that are maximum informed through physical exertion. These motifs depend upon powerful and powerful administration characteristics, which have been related to physical exertion and physical health. Administrative characteristics and mental fitness uphold instructional performance. introductory cognitive capabilities associated with interest and reminiscence grease literacy, and those capabilities are more suitable through physical activities and superior cardio health. Single classes of and long-time period participation in bodily exertion ameliorate cognitive performance and mental fitness. Children who participate in vigorous or moderate-depth physical activities earn the maximum. Given the importance of time on the project to literacy, pupils must be provided with common physical activity breaks that are developmentally appropriate. Although currently understudied, bodily lively assignments supplied inside the study room can also boost time on the project and interest in to project inside the study room setting.

Although academic presentation shoots from multiple interactions between intelligence and contextual variables, health is a vigorous moderating issue in a child's ability to learn. The impression that healthy children learn better is empirically supported and well-accepted (Basch, 2010), and numerous studies have confirmed that health

benefits are associated with physical activity, including cardiovascular and muscular fitness, bone health, psychosocial outcomes, and cognitive and brain health (Strong et al., 2005).

Given that the brain is responsible for the human body's mental processes and physical actions, brain health is important across the lifespan. In adults, brain health, representing the absence of disease and optimal structure and function, is measured in terms of quality of life and effective functioning in activities of daily living. In children, brain health can be measured in terms of the successful development of attention, on-task behaviour, memory, and academic performance in an educational setting.

This study will review the findings of recent research regarding the contribution of physical activity engagement and the attainment of a health-enhancing level of physical fitness to cognitive and brain health in college students. Because research in adults has served as a model for understanding the effects of physical activity and fitness on the developing brain during childhood to adulthood, research will be briefly discussed. The short- and long-term cognitive benefits of both a single session of and regular participation in physical activity will be summarised.

Before outlining the health benefits of physical activity and fitness, it is important to note that many factors influence academic performance. Among these are socioeconomic status (Sirin, 2005), parental involvement (Fan and Chen, 2001), and a host of other demographic factors. A valuable predictor of student academic performance is a parent having clear expectations for the child's academic success. Attendance is another factor confirmed as having a significant impact on academic performance (Stanca, 2006; Baxter et al., 2011). Because children must be present to learn the desired content, attendance should be measured by considering factors related to academic performance.

Regular physical activity participation throughout childhood provides immediate health benefits by positively affecting body composition and musculoskeletal development (Malina and Bouchard, 1991), and reducing the presence of coronary heart disease risk factors (Gutin et al., 1994). In recognition of these health benefits, physical activity guidelines for children and youth have been developed by the Health Education Authority [now Health Development Agency (HDA)] (Biddle et al., 1998). The primary recommendation advocates the accumulation of 1 hour of physical activity per day of at least moderate intensity (i.e. the equivalent of brisk walking), through lifestyle, recreational and structured activity forms. A secondary recommendation is that children take part in activities that help develop and maintain musculoskeletal health, on at least two occasions per week (Biddle et al., 1998). This target may be addressed through weight-bearing activities that focus on developing muscular strength, endurance and flexibility, and bone health.

Physical education (PE) in higher education levels provides a context for regular and structured physical activity participation. To this end, a common justification for PE's place in the school curriculum is that it contributes to children's health and fitness (Physical Education Association of the United Kingdom, 2004; Zeigler, 1994). The extent to which this foundation is accurate is debatable (Koslow, 1988; Michaud and Andres, 1990) and has seldom been tested. However, there would appear to be some truth in the supposition because PE is commonly highlighted as a significant contributor to helping young people achieve their daily volume of physical activity (Biddle et al., 1998; Corbin and Pangrazi, 1998). The important role that PE has in promoting health-enhancing physical activity is exemplified in the US 'Health of the Nation' targets. These include three PE-associated objectives, two of which relate to increasing the number of schools providing and students participating in daily PE classes. The third objective is to improve the number of students who are engaged in beneficial physical activity for at least 50% of lesson time (US Department of Health and Human Services, 2000). However, research evidence suggests that this criterion is somewhat ambitious and, as a consequence, is rarely achieved during regular PE lessons (Stratton, 1997; US Department of Health and Human Services, 2000; Levin et al., 2001; Fairclough, 2003a).

Materials and Methods

Location of the study

The study was conducted in Birbhum, Burdwan and Murshidabad districts of West Bengal, India. The subjects for the study were collected from different universities and colleges within those districts. In West Bengal, Physical Education is taught at the college level as a General Elective subject at the Graduation level in different colleges. So many students have chosen the subject as an elective subject, as Core, GE and SEE (at present Major and Minor) according to the UGC CBCS curriculum. The researcher believes that there exist some differences in respect of the Physical fitness make-up among the students who frequently participate in physical activity classes, as per their preference and academic compulsion to participate in the Physical Education curriculum and the students who seldom participate in physical activities without any curriculum compulsion, like recreational games.

Subjects

60 male students were selected through simple random sampling from the two populations of college students aged 22 to 25. Among the subjects, 30 came from the Physical Education stream (PEG), and the remaining 30 came from the non-physical education stream (NPEG) of General Degree Colleges in West Bengal.

After selecting the students, they were tested for Physical fitness data. Data from 60 subjects was collected by using different fitness tests to measure Speed (50m dash), Exclusive Strength (SBJ test), Endurance (600m run), and Flexibility (Sit and Reach test). Two-sample "t" test revealed significant difference exists between the means of strength, flexibility, and speed scores of the two groups

Sampling Design:

Sampling is a fundamental part of statistics. For the present study, samples were collected to achieve an understanding of a population because it is typically not feasible to observe all members of the population. The goal is to collect samples that provide an accurate representation of the population. The population was the male college students of different districts of West Bengal in the age group 20-25 years, including students studying in physical Education courses, who were taken as a special population for sampling. All samples were collected through the Simple Random sampling method.

Data Collection strategy (Primary & Secondary methods):

Physical fitness data of 60 subjects were collected by using different fitness tests to measure Speed (50m dash), Explosive Power (SBJ test), Endurance (600m run), Flexibility (Sit and Reach test) and Agility (Shuttle Run).

Selection of variables

The investigator conducted an extensive literature review for the study, examining relevant scientific literature from various sources. These sources included books, journals, periodicals, magazines, research papers, and available resources from Sri Venkatesara University; University of Kalyani, West Bengal; West Bengal State University, West Bengal and Sports Universities. The investigator also sought guidance from professional experts in the field of yoga to ensure a comprehensive understanding of the subject.

Result & Discussion

Table No. 1: Descriptive Statistics of different physical fitness variables of both male groups

Variables /Group	50m dash		Sit ups		SBJ		Sit & Reach		600m		Shuttle Run	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
PEM	8.1905	0.968819	25.53	8.059695	1.9622	0.249636	37.534	6.66714	2.2894	0.388969	10.9635	1.429466
NPEM	9.3141	1.425939	20.79	7.350249	1.8855	0.252748	33.046	8.409656	2.8607	0.713832	11.8863	1.300866

Table No. 2. Two-Sample Z-Test (Two-Tailed) Validation Table in relation to 50m dash data of PEM & NPEM

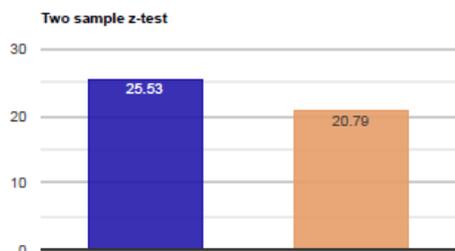| Section	Details
1. Hypothesis	- **Null hypothesis (H₀):** $\mu_1 = \mu_2$ (no difference between PEM 50m and NPEM 50m population means) - **Alternative hypothesis (H₁):** $\mu_1 \neq \mu_2$ (difference exists) **Decision:** Since *p-value < α (0.05)*, reject H₀. The average of the PEM 50m population is **not equal** to the average of the NPEM 50m population.
2. P-value	p = **0.04524** - Probability of Type I error (rejecting a true H₀) = **4.52%** - Interpretation: The difference is statistically significant at $\alpha = 0.05$.
3. Test Statistic	Z = **-2.002** - Critical region (95% acceptance): **[-1.960, +1.960]** - Since Z is outside the acceptance region, reject H₀. Difference of means = **-1.12** (not in the acceptance range [-1.100, +1.100]) Standard error (S′) = **0.5611**

4. Effect Size	Cohen's d = **0.28** - Magnitude: **Small effect** - Interpretation: Although statistically significant, the actual difference between means is small in size.
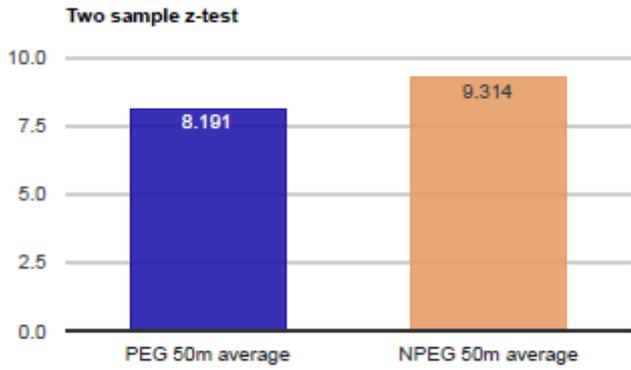
Fig. 1: Comparison of the average of 50m score of PEM and NPEM

Table No.3: Two-Sample Z-Test (Two-Tailed) Validation Table in relation to Sit-ups data of PEM & NPEM
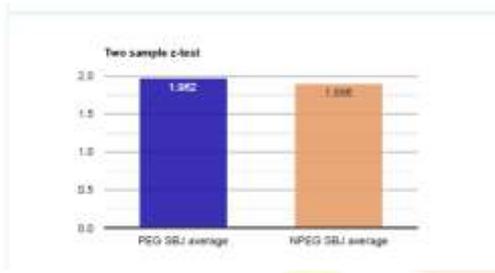
Section	Details
1. Hypothesis	Since p-value < α, H_0 is rejected. The average population of PEM Sit-ups is not considered equal to that of NPEM Sit-ups.
2. P-value	The p-value equals **8.88178e-16**, (p(x≤Z) = 1). It means that the chance of type I error (rejecting a correct H) is small: 8.882e-16 (8.9e-14%). The smaller the p-value, the more it supports H.
3. Test Statistic	The test statistic Z equals **8.447519**, which is not in the 95% region of acceptance: [-1.959964: 1.959964]. .x̄-x̄=4.74, is not in the 95% region of acceptance: [-1.099758: 1.099758]. The standard deviation of the difference, S' equals 0.561111, is used to calculate the statistic.
4. Effect Size	Cohen's d = 1.19 - Magnitude: Large **effect** - Interpretation: Statistically significant, the actual difference between means is large in size.

Fig. 2: Comparison of the average of SU score of PEM and NPEM

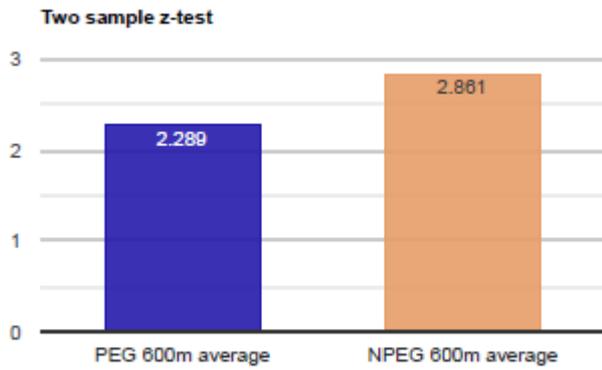**Table No. 4: Two-Sample Z-Test (Two-Tailed) Validation Table in relation to SBJ data of PEM & NPEM**

Section	Details
1. Hypothesis	Since p-value > α, H_0 cannot be rejected. The average of **PEM SBJ's** population is assumed to be **equal to** that of **NPEM SBJ's** population.
2. P-value	The p-value equals **0.891273** (p(x≤Z) = 0.554363). It means that the chance of type I error, rejecting a correct H, is too high: 0.8913 (89.13%). The larger the p-value, the more it supports H.
3. Test Statistic	The test statistic Z equals **0.136693**, which is in the 95% region of acceptance: [-1.959964: 1.959964]. .x̄-x̄=0.077 is in the 95% region of acceptance: [-1.099758: 1.099758]. The standard deviation of the difference, S' equals 0.561111, is used to calculate the statistic.
4. Effect Size	The observed effect size d is **small**, **0.019**. This indicates that the magnitude of the difference between the average and the average is small.

Fig. 3: Comparison of the average of SBJ score of PEM and NPEM

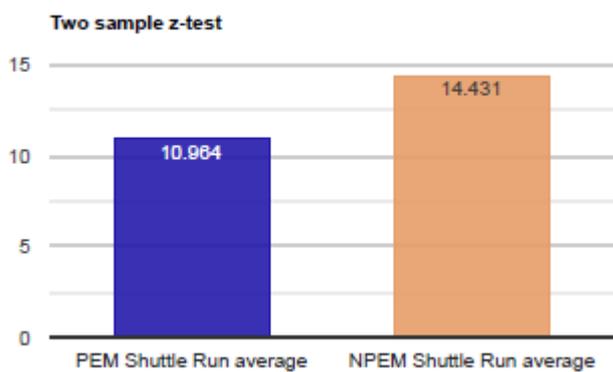**Table No. 5: Two-Sample Z-Test (Two-Tailed) Validation Table in relation to 600m run data of PEM & NPEM**

Section	Details
1. Hypothesis	Since p-value > α, H_0 cannot be rejected. The average of **PEM 600m 's** population is assumed to be **equal to** the average of **NPEM 600m 's** population.
2. P-value	The p-value equals **0.308603** (p(x≤Z) = 0.154302). It means that the chance of type I error, rejecting a correct H, is too high: 0.3086 (30.86%). The larger the p-value, the more it supports H.
3. Test Statistic	The test statistic Z equals **-1.018158**, which is in the 95% region of acceptance: [-1.959964: 1.959964]. .. .x̄-x̄=-0.57 is in the 95% region of acceptance: [-1.099758: 1.099758]. The standard deviation of the difference, S' equals 0.561111, is used to calculate the statistic.
4. Effect Size	The observed effect size d is **small**, **0.14**. This indicates that the magnitude of the difference between the average and the average is small.

Fig. 4: Comparison of the average of the 600m score of PEM and NPEM

Table No. 6: Two-Sample Z-Test (Two-Tailed) Validation Table in relation to the Shuttle run data of PEM & NPEM

| Section	Details
1. Hypothesis	Since p-value < α, H_0 is rejected. The average of **PEM Shuttle Run's** population is considered to be **not equal to** the average of **NPEM Shuttle Run's** population.
2. P-value	The p-value equals **6.40793e-10**, ($p(x \le Z) = 3.20396e-10$). It means that the chance of type I error (rejecting a correct H) is small: 6.408e-10 (6.4e-8%). The smaller the p-value the more it supports H.
3. Test Statistic	The test statistic Z equals **-6.180055**, which is not in the 95% region of acceptance: [-1.959964: 1.959964]. $\bar{x}-\bar{x}$=-3.47, is not in the 95% region of acceptance: [-1.099758: 1.099758]. The standard deviation of the difference, S' equals 0.561111, is used to calculate the statistic.
4. Effect Size	The observed effect size d is **large**, **0.87**. This indicates that the magnitude of the difference between the average and the average is large.

Fig. 5: Comparison of the average of the Shuttle Run score of PEM and NPEM

Table No. 7: Two-Sample Z-Test (Two-Tailed) Validation Table in relation to SR data of PEM & NPEM

Section	Details
1. Hypothesis	Since p-value < α, H_0 is rejected. The average of **PEM's** population is considered to be **not equal to** the average of **NPEM's** population.
2. P-value	The p-value equals **1.77636e-15**, ($p(x \le Z) = 1$). It means that the chance of type I error (rejecting a correct H) is small:

	1.776e-15 (1.8e-13%). The smaller the p-value, the more it supports H.
3. Test Statistic	The test statistic Z equals **7.99841**, which is not in the 95% region of acceptance: [-1.959964: 1.959964]. . .$\bar{x}$-$\bar{x}$=4.49 is not in the 95% region of acceptance: [-1.099758: 1.099758]. The standard deviation of the difference, S' equals 0.561111, is used to calculate the statistic.
4. Effect Size	The observed effect size d is **large**, **1.13**. This indicates that the magnitude of the difference between the average and the average is large.
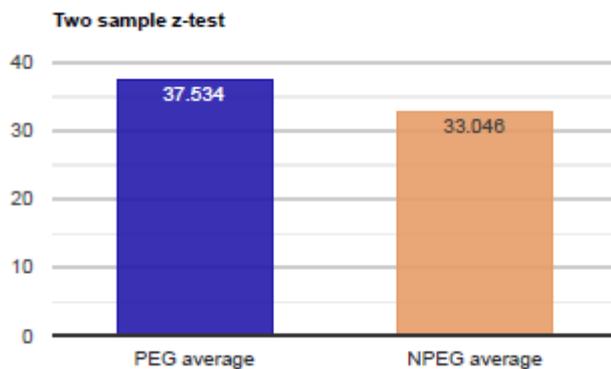
Fig. 6: Comparison of the average of SR score of PEM and NPEM

Discussion:

The comparison of physical fitness components between Physical Education Men (PEM) and Non-Physical Education Men (NPEM) revealed consistent performance advantages for PEM across all tested variables. In the 50 m dash, PEM recorded a faster mean time (M = 8.19 s, SD = 0.97) compared to NPEM (M = 9.31 s, SD = 1.43), indicating superior sprinting speed and reduced variability. For sit-ups, PEM achieved a higher mean count (M = 25.53, SD = 8.06) than NPEM (M = 20.79, SD = 7.35), reflecting greater abdominal strength and endurance. In the standing broad jump, PEM (M = 1.962 m, SD = 0.25) outperformed NPEM (M = 1.886 m, SD = 0.25), suggesting enhanced lower-body explosive power.

Flexibility, measured by the sit-and-reach test, was higher in PEM (M = 37.53 cm, SD = 6.67) than in NPEM (M = 33.05 cm, SD = 8.41), with PEM also showing less score variability. In the 600 m run, PEM completed the distance more quickly (M = 2.29 min, SD = 0.39) compared to NPEM (M = 2.86 min, SD = 0.71), indicating superior cardiovascular endurance. Finally, shuttle run results showed PEM (M = 10.96 s, SD = 1.43) outperforming NPEM (M = 11.89 s, SD = 1.30), demonstrating better agility and speed. Overall, PEM consistently outperformed NPEM across all physical fitness parameters, with performance advantages observed in speed, strength, flexibility, endurance, and agility.

According to Table No. 2, since p-value < α, H_0 is rejected. The average of PEM 50m 's population is considered to be not equal to the average of NPEM 50m 's population. In other words, the difference between the sample average of PEM 50m and NPEM 50m is big enough to be statistically significant. The p-value equals 0.0452359, (p(x≤Z) = 0.022618). It means that the chance of type I error (rejecting a correct H0) is small: 0.04524 (4.52%). The smaller the p-value, the more it supports H1. The test statistic Z equals -2.002454, which is not in the 95% region of acceptance: [-1.959964: 1.959964]. $\bar{x}$-$\bar{x}$=-1.12 is not in the 95% region of acceptance: [-1.099758: 1.099758]. The standard deviation of the difference, S' equals 0.561111, is used to calculate the statistic. The observed effect size d is small, 0.28. This indicates that the magnitude of the difference between the average and the average is small.

According to Table No. 3, since p-value < α, H_0 is rejected. The average of **PEM Sit-up's** population is considered to be **not equal to** the average of **NPEM in Sit-up's** population. In other words, the difference between the sample average of **PEM Sit-ups** and **NPEM Sit-ups** is big enough to be statistically significant. The p-value equals **8.88178e-16**, (p(x≤Z) = 1). It means that the chance of type I error (rejecting a correct H) is small: 8.882e-16 (8.9e-14%).The smaller the p-value the more it supports H1. The test statistic Z equals **8.447519**, which is not in the 95% region of acceptance: [-1.959964: 1.959964]. $\bar{x}$-$\bar{x}$=4.74 is not in the 95% region of acceptance: [-1.099758: 1.099758]. The standard deviation of the difference, S' equals 0.561111, is used to calculate the

statistic. The observed effect size d is **large**, **1.19**. This indicates that the magnitude of the difference between the average and the average is large.

According to Table No. 4, since p-value > α, H_0 cannot be rejected. The average of **PEM SBJ's** population is assumed to be **equal to** the average of **NPEM SBJ's** population. In other words, the difference between the sample average of **PEM SBJ** and **NPEM SBJ** is not big enough to be statistically significant. The p-value equals **0.891273** (p(x≤Z) = 0.554363). It means that the chance of type I error, rejecting a correct H_0, is too high: 0.8913 (89.13%). The larger the p-value the more it supports H. The test statistic Z equals **0.136693**, which is in the 95% region of acceptance: [-1.959964: 1.959964]. .. .x̄-x̄=0.077 is in the 95% region of acceptance: [-1.099758: 1.099758]. The standard deviation of the difference, S' equals 0.561111, is used to calculate the statistic. The observed effect size d is **small**, **0.019**. This indicates that the magnitude of the difference between the average and the average is small.

According to Table No. 5, since p-value > α, H_0 cannot be rejected. The average of **PEM 600m 's** population is assumed to be **equal to** the average of **NPEM 600m 's** population. In other words, the difference between the sample average of **PEM 600m** and **NPEM 600m** is not big enough to be statistically significant. The p-value equals **0.308603** (p(x≤Z) = 0.154302). It means that the chance of type I error, rejecting a correct H, is too high: 0.3086 (30.86%). The larger the p-value, the more it supports H. The test statistic Z equals **-1.018158**, which is in the 95% region of acceptance: [-1.959964: 1.959964]. .x̄-x̄=-0.57 is in the 95% region of acceptance: [-1.099758: 1.099758]. The standard deviation of the difference, S' equals 0.561111, is used to calculate the statistic. The observed effect size d is **small**, **0.14**. This indicates that the magnitude of the difference between the average and the average is small.

According to Table No. 6, since p-value < α, H_0 is rejected. The average of **PEM Shuttle Run's** population is considered to be **not equal to** the average of **NPEM Shuttle Run's** population. In other words, the difference between the sample average of **PEM Shuttle Run** and **NPEM Shuttle Run** is big enough to be statistically significant. The p-value equals **6.40793e-10**, (p(x≤Z) = 3.20396e-10). It means that the chance of type I error (rejecting a correct H) is small: 6.408e-10 (6.4e-8%). The smaller the p-value the more it supports H. The test statistic Z equals **-6.180055**, which is not in the 95% region of acceptance: [-1.959964: 1.959964]. .x̄-x̄=-3.47, is not in the 95% region of acceptance: [-1.099758: 1.099758]. The standard deviation of the difference, S' equals 0.561111, is used to calculate the statistic. The observed effect size d is **large**, **0.87**. This indicates that the magnitude of the difference between the average and the average is large.

In light of the findings and within the limitations of the study conducted by **Kaur & Saini (2014),** it is concluded that physical education students performed significantly better on various physical fitness components compared to their non-physical education counterparts. It is evident from the above findings that significant differences were observed between physical education and non-physical education students in various physical fitness components, namely shoulder strength, abdominal strength, agility, explosive strength of the legs, speed, and endurance. These differences may be attributed to the fact that physical education students engage in more regular and structured physical workouts, which likely contributed to their superior performance on these physical fitness variables.

Many research studies have examined the usefulness of physical fitness. It is proven that fitness has a significant and positive impact on an individual's lifestyle. The findings of the study conducted by Karak (2016) revealed statistically significant results for all selected physical education students. Based on the results obtained from the current empirical investigation and within its limitations, the following conclusions have been drawn: Physical Education students have greater arm and shoulder strength compared to General students. They also have more abdominal, leg strength, agility, speed, and cardiovascular endurance in comparison to the General students.

Kumar and Kumar (2019) conducted a study and the analysis of the results indicated significant differences between the mean scores of education and physical education students about resting pulse rate, resting respiratory rate, vital capacity, diastolic blood pressure, systolic blood pressure, and heart rate. The calculated *t*-values for these variables—19.015, 5.232, 9.088, 18.790, 22.169, and 10.150, respectively—were all higher than the critical value at the 0.05 level of significance. These findings suggest that all parameters of the physiological variables, namely resting pulse rate, resting respiratory rate, vital capacity, blood pressure, and heart rate, were greater in physical education students compared to education students in Western Uttar Pradesh.

Pelemis et. al. (2024) conducted a study and the results of this study confirm the significant impact of physical activity (PA) levels on the physical fitness of school-aged children. Children with lower activity levels generally exhibited poorer physical fitness across both genders. These findings underscore the need for systematic evaluation of PE class implementation and careful planning to maximize its effectiveness. Regular participation in well-structured PE sessions is essential for improving children's physical fitness. Furthermore, the results offer PE teachers valuable guidance regarding both the quantity (e.g., optimal frequency and duration) and quality

(e.g., diversity and structure) of physical activities appropriate for this age group. Therefore, PE teachers should actively promote and deliver effective PE programs that foster healthy physical development and encourage lifelong engagement in an active lifestyle.

In another study, **Baro & Saikia (2014)** concluded that there were significant differences in physical fitness between students of Physical Education and student dancers of Performing Arts {t (.05, 58) = 5.25 > 2.0017}. They also observed that the Physical Education students have better physical fitness than dancers of the Performing Arts (m = 315.99 > 276.69). It was also further concluded that there were significant differences in Speed (2.97), Flexibility (3.14), Explosive Leg Strength (3.32), Balance (3.35) and Arm Strength (2.19) > tabulated t (0.05, 58) = 2.0017, and the insignificant difference was observed as in the case of Cardiovascular Endurance (0.957 < 2.0017). The above findings are very much relevant to the findings of the present study.

The findings of the present study indicate some physical fitness-related problems faced by adolescent boys in their school and college days, which are authenticated by some other studies. **Zhao et al. (2019)** conducted a study and reported that the decline of the physical fitness of modern students has become a prominent realistic problem, and it is also a common and urgent problem faced by schools and students. Their work took college students as research objects and found that their physical indicators are generally weak. The main reason comes from students themselves as well as colleges and universities. The poor fitness awareness of students, the irrational physical education curriculum, and inadequate physical education equipment in colleges and universities have greatly affected the physical health of college students. Based on specific reasons, their work put forward corresponding strategies from individuals and schools, aiming to help students improve their fitness awareness, take the initiative to participate in sports, and ensure that college students have a healthy and strong body.

Sitaram and Vitthalrao (2020) concluded that sportsmen possess significantly better physical fitness compared to non-sportsmen. Furthermore, they also reported that sportsmen demonstrate significantly better mental health than non-sportsmen.

Conclusion:

Across all six physical fitness tests, **PEM outperformed NPEM**, with lower times in speed/agility tests and higher scores in strength, flexibility, and endurance measures. This reflects the **positive impact of regular physical education participation** on multiple fitness components.

The average of the PEG 50m population is **not equal** to the average of the NPEG 50m population. The Difference is Significant. The average population of PEM Sit-ups is not considered equal to that of NPEM Sit-ups. The difference is significant.

The average of **PEM SBJ's** population is assumed to be **equal to** that of **NPEM SBJ's** population. The difference is not significant.

The average of **PEM 600m 's** population is assumed to be **equal to** the average of **NPEM 600m 's** population. The difference is not significant.

The average of **PEM Shuttle Run's** population is considered to be **not equal to** the average of **NPEM Shuttle Run's** population. The difference is significant.

In the case of Sit and Reach performance, the average of **PEM's** population is considered to be **not equal to** the average of **NPEM's** population. The difference is significant.

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