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Comparison Of Physical Fitness Components Of Government And Private Schools' Students

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ABSTRACT

A substantial number of children in Pakistan are school going, either in private or government schools. These schools cater population from varying family backgrounds, status and lifestyles and hence have varying levels of physical fitness. However, the government, school administrations or stakeholders do not have directive strategies to monitor their physical activity in terms of their achievements. The present study was conducted with an aim to compare the components (speed, endurance, flexibility, balance) of physical fitness of government and private schools' children. Cross sectional study design was used for time span of 18 months. The study was conducted on male children (n=304, 152 each from private and government schools) located within/outskirts of the main city of Sargodha, Pakistan. Total ten schools (5 each from private and government sector) were earmarked and registered in the study. Convenience sampling technique was used. Children between the ages of 9-11 years, Children in primary level of education and children which are the residents of Sargodha were included in the study. There were statistically significant differences between 20-meter speed test, flexibility sit and reach test and aerobic endurance 6-minute run test of Private and Government schools' students but there were no statistically (p=0.089) significant differences between Flaming balance of Private and government school's student. Finally, it was concluded that the components of physical fitness of government school children is better than the private schools' children.

Keywords: Physical fitness, Speed, Endurance, Flexibility, Balance, School sector

INTRODUCTION

Total Force Fitness has been defined as a state in which the individual, its family and organization can manage appropriate well-being and performance under variable conditions (Macera et al., 2005). One of its major components is 'physical fitness' which encompasses behavioral, spiritual, medical, cognitive and social well-being (Buyse et al., 2002; Syväoja et al., 2018). Health-related and performance-related forms of physical fitness have been well-elucidated earlier by various workers (Das & Dhundasi, 2001; Davydenko, 2004; Diaz, Squires, & Julian, 1999; Tremblay et al., 2018). The 'physical fitness' has been defined as a dynamic state of energy and vitality which

permits the people to carry on their daily tasks and chores, to enjoy their leisure pass-times and cope with emergent situations of life without having a feeling of mental or physical fatigue (Buyse et al., 2002; Ji, Hu, & He, 2007).Differently, it has been defined as "a measure of capacity to perform physical activity (PA)/physical exercise (PE) that organizes all the bodily systems involved in bodily movements such as cardiovascular system, metabolic system and skeletal system"(Organization, 2019).Health-related physical fitness has been correlated with the physical well-being of a person allied to sports and PA. Strength, power/or endurance are few of the specific motor skills required for the appropriate physical fitness.

The terms 'physical fitness', 'physical activity' and 'physical exercise' are normally confusing. Certain researchers have used them interchangeably, though differences do exist among them. The PA is a set of specific bodily movements produced by the skeletal muscles of a body which require energy consumption. Contrary to it, PE is termed as "any planned structured or systematic PA designed to improve or maintain one or more components of physical fitness"(Fernando, Ravichandran, & Vaz, 2015; Syväoja et al., 2018).

The physical fitness trainings, accordingly, have been split into specific aspects in order to attain endurance, coordination, flexibility, speed and strength. 'Endurance' is to accomplish a task in a successful way, with repetitive attempts, without giving up(Ji et al., 2007), whereas, 'coordination' is a rhythmic pattern of various components of the body for effective working(Kaya, UMUCALILAR, Haliloğlu, & İpek, 2001). Similarly, 'flexibility' is the ability to bend the body without harming itself. Strength, on the other hand, is the state and ability of being physically strong(Buyse, Decuypere, Berghman, Kuhn, & Vandesande, 1992). All these aspects are essential in maintaining a physically well-balanced and task-oriented life. Furthermore, Motor Performance Ability (MPA)- "an ability of the neuromuscular system of the body to perform specific task or a set of tasks" is one of the best indicators of physical fitness.

A thorough review of literature reveals that the scientific data and respective publications regarding PA started emanating in 1970s (Heinze lmann& Bagley, 1970) leading to latest documents which have now deduced a strong and clear establishment of a positive relationship between PA and human benefits in various ways and forms. In general, PA has been known to substantially lower the risks of cardiovascular diseases, obesity, hypertension, and various cancers (Guthold, Stevens, Riley, & Bull, 2018; Haskell et al., 2007; Lee et al., 2012). Apart from this, effect of PA on mental health and sociological aspects of humans have also been elucidated (Farholm & Sørensen, 2016; Hallal et al., 2012). People of different age groups can obtain emotional, psychological, social, and physical benefits from PA (Janssen & LeBlanc, 2010; Roe & Roe, 2018).

Various workers from varying geographical entities have studied effects of PA in human beings and have correlated them with their various health aspects depicting it a positive correlation. Similarly, prevalence of PA has also been extensively studied. A study emanating from Australia in 2009 (Bauman et al., 2012), incorporated 52,746 respondents through IPAQ based survey to estimate an international prevalence of PA in 20 countries. Results revealed that high PA ranged from 21 to 60% in eight countries. Males were found to be more active than females. This study

not only determined 'high', 'low' and 'median' levels of PA in the human population but also established the feasibility of PA surveillance through IPAQ.

Literature review clearly reveals that there is lack of data regarding physical fitness levels in private and government school going children from Pakistan. Furthermore, socioeconomic determinants as correlates to physical fitness in these children are also yet unexplored. The present study will accordingly cater multipronged objectives of assessing physical fitness levels among children of private and government schools, and to correlate them with various socioeconomic attributes. The study will envisage a directional strategy for the government, parents of the children and all stakeholders for assuring optimal physical fitness level in school-goers for better achievements. In general, this study will also unveil various factors/issues responsible for Pakistan's poor performance at international sports events.

Objective of the study: To compare the components of physical fitness of government and private schools students.

Hypotheses of study: $\mathbf{H_a}$ There is a difference in components of physical fitness of government and private schools. $\mathbf{H_0}$ There is no difference in components of physical fitness of government and private schools.

MATERIAL AND METHODS

Cross sectional study design was used. The study was conducted at the private and government schools (5 each) located within/outskirts of the main city of Sargodha, Pakistan.

Sargodha occupies the status of eleventh largest city of Pakistan. The study was conducted in a time span of 18 months. This duration coincides with the opening of all educational institutes of Pakistan after a long COVID-19 lock-down. The study was conducted in collaboration with/and by the consent of Punjab School Education Department and various educationists from private education sector of Sargodha. A total of ten schools (5 each from private and government sector) were earmarked and registered in the study. Male children (n=304, 152 each from private and government schools) from 9-11 years (Late childhood) of age were incorporated in the study apropos to relevant consent from parents and school administrations. Approximately 30 children were taken from each school by using convenience sampling technique. Children between the ages of 9-11 years, Children in primary level of education and children which are the residents of Sargodha were included in the study.

The rules and regulations set by the Ethical Committee of University of Lahore were followed while conducting the research and the rights of the research participants were respected.

Apropos to an approval by the Punjab School Education Department, Pakistan and relative administrative units of the schools, a written consent was taken from the parents of the children registered under this study. Furthermore, considering the personal and revealing nature of the research, all the respondents and children were ascertained that the data/results will be kept confidential. The participants were allowed to withdraw from the research at any moment.

Owing to prevailing pandemic of COVID-19, appropriate SOPs were followed as prescribed by the WHO and national government.

Physical fitness of school children was tested using the German motor performance test DMT 6-18. The German motor performance test originally included 8 tests. However, considering the status of Pakistan and the availability of tools, following four (04) components were incorporated in this study: 1) Speed Test (20 m sprint), 2)Aerobic Endurance (6 Min Run), 3) Flexibility (sit-and-reach test) and 4) Balance (Flamingo balance test).

DATA ANALYSES AND RESULTS

Data was analyzed using SPSS version 23.0. The study population (school going children) was grouped as type of institution (private and government school goers). Normality of data was ascertained through Shapiro Wilk Normality. Test Differences between private and government school-going children was deduced through Mann Whitney U test. Statistical significance was considered at $P \leq 0.05$.

Table 1 Comparisons of 20m sprint (Seconds) of Private & Government School Going Children private (n=152) and government (n= 152)

	20m sprint (Seconds)	
	Private	Government
Mean ±SD	6.8 ±0.63	4.9 ±0.35
Median±IQ Range	6.91±1.01	4.92 ±0.41
Shapiro-Wilk test (p Value)	<0.001	
U** – Value	92.00	
p – Value	<0.001	

(*Significant, P≤0.05, **Mann Whitney value)

Due to the non-normality of the variables, we used a median as a measure of central tendency. From Table 1 it has been observed that there were 152 private school students with Mean±SD 6.8±0.63, Inter quartile range 1.01, median of 6.91seconds for 20 m speed. While there were 152 government school students with Mean±SD is 4.9±0.35, Inter quartile range 0.41, Median of 4.92 seconds for 20 m speed, Mann Whitney U test was used to compare the 20 m speed (fitness levels) of private and government school going children. A statistically significant differences was found (U =92.00, (p< 0.05). There were statistically significant differences between 20 m speed of Private and Government schools' students.

Table 2 Comparisons of Flamingo balance Test of Private & Government School Going Children private (n=152) and government (n= 152)

	Flamingo balance test	
	Private	Government
Mean ±SD	26.58 ±11.49	29.02 ±12.08

Median±IQ Range	26.25 ±17.50	28.25 ±18.50
Shapiro-Wilk test p-Value)	<0.001	
U** – Value	10249	
p – Value	0.089	

(*Significant, P≤0.05, **Mann Whitney value)

Due to the non-normality of the variables, we used a median as a measure of central tendency. From Table 2 it has been observed that there were 152 private school students with Mean±SD 26.58±11.49, Inter quartile range 17.50, median of 26.50 for Flamingo Balance Test, and 152 government school students with Mean±SD is 29.02±12.08, Inter quartile range 18.50, median of 28.25 for Flamingo Balance, over all Mann-Whitney U =10249, (p >0.05);
Mann Whitney U test was used to compare the Flamingo Balance Test (fitness levels) of private and government school going children. There were no statistically significant differences between Flaming balance of Private and government school's student.

Table 3 Comparisons of Flexibility (sit and reach test) and of Private & Government School Going Children private (n=152) and government (n= 152)

	Flexibility (sit and reach test)	
	Private	Government
Mean ±SD	7.7 ±1.95	8.7 ±1.97
Median±IQ Range	8.00 ±3.00	9.00 ±3.00
Shapiro-Wilk test (p-Value)	<0.001	
U** – Value	8318	
p – Value	<0.001	

(*Significant, P≤0.05, **Mann Whitney value)

Due to the non-normality of the variables, we used a median as a measure of central tendency. From Table 3 it has been observed that there were 152 private school students with Mean±SD is 7.7±1.95, Inter quartile range 3.00, median of 8.00 for sit and reach test and 152 government school students with Mean±SD is 8.7±1.97, Inter quartile range 3.00, median of 9.00 for sit and reach test, over all Mann-Whitney U =8318, (p <0.05); to compare Flexibility Mann Whitney U test was used (sit and reach test) (fitness levels) of private and government school going children. There were statistically significant differences between Flexibility (sit and reach test) of Private and government schools' student.

Table 4 Comparisons of Aerobic Endurance (6-minute run) of Private & Government School Going Children private (n=152) and government (n= 152)

	Aerobic Endurance (6-minute run)	
	Private	Government
Mean ±SD	409 ±12.84	590 ±11.8
Median±IQ Range	430.00 ±240.00	630.00 ±235.00
Shapiro-Wilk test (p-Value)	<0.001	

U^{**} – Value	4221.00
p – Value	<0.001

(*Significant, P≤0.05, **Mann Whitney value)

Due to the non-normality of the variables, we used a median as a measure of central tendency. From Table 4 it has been observed that there were 152 private school students with Mean±SD is 409±122.84, Inter quartile range 240.00 median of 430.00 for Aerobic Endurance 6 minute run and152 government school students with Mean±SD 590±146.52, Inter quartile range 235.00 the median of 630.00 for Aerobic Endurance 6 minute run, over all Mann-Whitney U =4221.00, ($p< 0.05$); Mann Whitney U test was used to compare the Aerobic Endurance 6 minute run of private and government school going children. There were statistically significant differences between Aerobic Endurance 6-minute run of Private and Government schools' students.

Mann Whitney U test was used to compare health related components of private and government school going children. There were significant differences between fitness levels of private and governmental school as speed ($p< 0.05$); flexibility ($p< 0.05$); aerobic endurance ($p< 0.05$); There were only no significant differences between flamingo balances ($p> 0.05$). Based on these overall results, the null hypothesis number is rejected and the alternative hypothesis is accepted.

DISCUSSION

The results of this study provide a baseline data both for the government and other stakeholders to strengthen their policies towards better health status of school staff and children. Assuring the optimal physical fitness level in school-goers will result ultimately in better achievements in global sports activities. Discussion presented ahead may be received in the context that this study was conducted immediately after opening of school's post-pandemic lockdown in Pakistan.

The present study included tests for endurance, balance, flexibility and speed for private and government school-going children to assess bodily fitness. All studied attributes of the present study were significantly different between private and government school-going children except for balance test. Results revealed that speed (6.8±0.05 seconds), flexibility (8.7±0.197inches), balance (29.02±12.08) were higher for government school-goers as compared to their counterpart private school-going children. However, aerobic endurance (490±11.8 meters), were higher for private school goers.

Excessive work has been reported globally to address the issue of devising valid, authentic and repeatable parameters to assess physical fitness in various age populations. An organic and a motor component are normally incorporated for assessing physical fitness. The organic part consists of adaptation/recovery from strenuous exercise whereas the motor part includes development/performance of gross motor abilities(Vanhees et al., 2005). Health-related physical fitness includes cardio respiratory endurance, body composition, muscular strength and flexibility. Performance-related fitness refers to the abilities associated with adequate athletic performance, and encompasses components such as isometric strength, power, speed–agility, balance and arm–

eye co-ordination as consolidated in previous studies(Butte, Ekelund, & Westerterp, 2012; Cadenas-Sanchez et al., 2016).

These results of the present study in general, underline that government school-goers had far better results of physical fitness attributes as compared to private school-goers as shown earlier (Samir, Mahmud, & Khuwaja, 2011). Similar results have been reported in a previous study conducted on bodily fitness among students of rural and urban Lahore, Pakistan which has demonstrated that the push-up test, touch-toe test, flexibility and strength revealed better results for rural students as compared to urban ones (Mahmood, Mujahid, Mahmood, Tariq, & Salam, 2018). Inactivity, lethargic lifestyles, unhealthy dietary patterns and resultant PI in urban population results in obesity and obesity-related non-communicable diseases as affirmed through prior global studies (Gardner, Vella, & Magee, 2017; Ramachandran, Chamukuttan, Shetty, Arun, & Susairaj, 2012; Rasinaho, Hirvensalo, Leinonen, Lintunen, & Rantanen, 2007; Sullivan & Lachman, 2017). Our results are also in line with those from other countries/regions of the world such as India (Bishwajit et al., 2017), Thailand (Lee et al., 2012) and Eastern Asia and Europe (Kahan, 2015), A 69% PI has been reported for urban populations as compared to 31% for rural communities of India (Rizwan, Khan, Farooq, Khalid, & Ahmad). While comparing Egyptian and German children in a study, it was reported that strength, coordination and endurance were far better in German children as compared to their Egyptian counterparts(Karim et al., 2015). Environmental conditions, socioeconomic profiles, and PA as core courses in curricula of German schools were deputed as the cause. The results similar to ours have also been mentioned in Egyptian (Abdelkarim, Ammar, Soliman, & Hökelmann, 2017) and Malaysian study (Aboshkair, Amri, Yee, & Samah, 2012). The results on physical fitness attributes of the present study will be discussed ahead in correlation to the socioeconomic determinants/factors which were incorporated in the present study for analyses.

CONCLUSION

The present study was conducted with an aim to compare the components (speed, endurance, flexibility, balance) of physical fitness of government and private schools' children. Experimental study design was used for time span of 18 months. The study was conducted on male children (n=304, 152 each from private and government schools) located within/outskirts of the main city of Sargodha, Pakistan. Total ten schools (5 each from private and government sector) were earmarked and registered in the study. Convenience sampling technique was used. Children between the ages of 9-11 years, Children in primary level of education and children which are the residents of Sargodha were included in the study. There were statistically significant differences between 20-meter speed test, flexibility sit and reach test and aerobic endurance 6-minute run test of Private and Government schools' students but there were no statistically ($p=0.089$) significant differences between Flaming balance of Private and government school's student. Finally, it was concluded that the components of physical fitness of government school children is better than the private schools' children except aerobic endurance.

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