

EFFECTS OF SOCIOECONOMIC DETERMINANTS ON PHYSICAL FITNESS COMPONENTS IN CHILDREN

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ABSTRACT

Socioeconomic status has been operationalized in a variety of ways, most commonly as education, social class, or income. Four main attributes were incorporated in this study being father's education, father's occupation, socioeconomic class and father's income per month in Pakistani rupees. The present study was conducted with an aim to determine the effect of socioeconomic determinants on components (speed, endurance, flexibility, balance) of physical fitness of government and private schools' children. Cross sectional study design was used. The study was conducted on male children from private and government schools, located within of the main city of Sargodha, Pakistan. Five each from private and government sector, total ten schools were selected in this 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. The overall effect of socioeconomic determinants on speed (20 m sprint test) in children is 79%. The overall effect of socioeconomic determinants on Flamingo Balance Test in children is 3%. The overall effect of socioeconomic determinants on Flexibility (Sit and reach test) in children is 8%. The overall effect of socioeconomic determinants on Aerobic Endurance (6 min. run) in children is 32%. Finally, it was concluded that the socioeconomic determinants effect the speed and Aerobic Endurance in components of physical fitness of government school children but no effect on Balance and Flexibility.

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

INTRODUCTION

The socioeconomic determinant is 'a position attained by an individual within a hierarchical social structure' (S. M. Saleem, 2019). Pakistan is the world's fifth most overcrowded country; one of the highest growths of population in the globe. According to the recent census of 2020, its current population is 220.9 million. Moreover, it is also a rapidly urbanizing state of Asia. The urban proportion has ascended from 17% in 1951 touching 37% in 2010 (Hussain, 2014). Urbanites are on the escalation and it is estimated, by 2025, nearly 50% of the populace will be residing in the main cities. To sum up, 'Pakistan is at an edge of the main demographic

transition'. Growth in population and exodus from rural to urban are one of the main issues considered the most accountable for the rapid process of urbanization. However, taken as a pointer of growth through greater openings of growth and opulence, urbanization is pretense threats and encounters to better ascendancy and urban service distribution. The settings of urban hubs will worsen more with time if the said development problems are not dealt with appropriately, timely and scientifically.

Studies of social determinants of health have repeatedly found socioeconomic inequalities in health. People with lower socioeconomic status (SES) have, on average, poorer health and die younger than those with more favorable SES. Socioeconomic inequalities in health persist into old age (Fors & Thorslund, 2015). The results from a comparative study showed that the magnitude of inequality in morbidity in eleven European countries varied, however, health inequalities in all age groups were observed in all countries (Hoffmann, 2008). As most morbidity and mortality occurs in old age, these inequalities may affect a substantial proportion of the older population and increase the economic burden of public spending as the population ages.

In studies of health inequalities in later life, SES is most commonly operationalized as either education, social class, or income – and often without providing a rationale for the choice of indicator (Ploubidis et al., 2014). The overarching aim of this study was to explore how the three most common indicators of SES (education, social class, and income) are associated with health in old age. We also included occupational complexity as an alternative indicator of SES, as recent research suggests that complexity is a key driver of labor market stratification (Le Grand & Tåhlin, 2013). Education, social class, occupational complexity, and income all have overlapping properties, but they may also be independently associated with health in old age.

Therefore, we explored the relation between these variables, a composite measure of the variables, and change in mobility limitations, activities of daily living, and psychological distress from working ages to old age. Education, social class, occupational complexity, income, and health in old age The individuals' highest attained level of education is generally reached in early adulthood, and serves to bridge socioeconomic conditions across generations (Mirowsky & Ross, 2003). Research suggests that the associations between education and health is driven by increases in human capital, psychosocial resources, living conditions, better health care and lifestyle, and selection (direct and indirect).

Studies show that people with lower levels of education tend to have a more rapid health decline in old age (Dupre & behavior, 2007). However, educational level often shows a weaker association with health in old age than other indices, such as wealth, income, tenure, and deprivation (Avlund et al., 2003). Most often, social class is identified using occupation as the stratifying principle. Many class schemas primarily distinguish occupations depending on ownership (i.e, between employers and employees). Thereafter, groups of employers and employees are distinguished depending on size and type of organization, skill requirements, power relations, and working conditions (Rose & Harrison, 2010). Besides being associated with current income, social class is also associated with: i) income security, ii) short term income stability, and iii) long term income development (Watson & Whelan, 2014).

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.

Objective of the study: To find the effect of socioeconomic determinants on components of physical fitness in children

Hypotheses of study: H_a There is a significant effect of socioeconomic determinants on components of physical fitness in children. H_0 There is no significant effect of socioeconomic determinants on components of physical fitness in children.

MATERIAL AND METHODS

Cross-Sectional study design was used. The study was conducted at the private and government schools (5 each) located within of the main city of Sargodha, Pakistan. Its coordinates are 32°5'1"N 72°40'16"E. 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).

For determination of socioeconomic attributes, the pretested and validated Socio-Economic Scale (SES) presented by Kuppuswamy (Kappu Swamy, 1976) was utilized for the present study with minor amendments. The SES by Kuppuswamy had originally incorporated three main attributes viz. father's education, father's occupation and income per month. For the present study similar three attributes were used, however, minor amendments were made in subclasses/subcases considering the differing socioeconomic aspects of India and Pakistan.

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. To find the effect of socioeconomic determinants on components of physical fitness in children was calculated by using the multiple regression analysis with statistical significance was considered at [Equation].

Table 1

Regression analyses for Socioeconomic Determinants of the study and speed (20 m sprint test) of Government and Private school going children

Model	Unstandardized Coefficients		Standardized Coefficients	T	P-value.	F (p-value)	R-Square (Adjusted R-Square)
	B	SE	B				
(Constant)	9.59	0.41		23.2	0.000		
Type of Institution	-2.27	0.17	-1.02	13.0	0.000	278.17 (0.000)	0.79(0.78)
father education	-0.04	0.02	-0.06	-1.8	0.078		
father occupation	0.02	0.03	0.08	0.89	0.374		
average income per month	-0.05	0.02	-0.18	-1.8	0.068		

The results for regression analyses between types of institutes and the socioeconomic determinants of the study (father's education, father's occupation, and father's income per month in Pakistani Rs.) and 20m Speed Test of school going children of the study is given in Table 1. Significance level revealed that the socioeconomic determinants of the present study was not good predictors of 20m Speed Test of the children at P-value is >0.05 . However, type of institute predicted significant of 20m Speed Test of children at significant $P \leq 0.05$. Overall Results showed highly significant with very good effect in terms of F (P-value) 278.17 (0.00), R-square value and (Adjusted R-Square) 0.79(0.78). The overall effect of socioeconomic determinants on speed (20 m sprint test) in children is 79%. Scatterplot in figure 1 showing the relationship between type of institute, socioeconomic determinants and 20 m sprint (Seconds) of Private and Govt. school children. The final model of multiple regression analysis is as follows:

[Equation]

Figure 1

Scatterplot between type of institute, socioeconomic determents and 20 m sprint (Seconds) of private and Govt. school children

Table 2

Regression analyses for Socioeconomic Determinants of the study and Flamingo Balance Test of Government and Private school going children

Model	Unstandardized Coefficients		Standardized Coefficients	T	P-value.	F (p-value)	R-Square (Adjusted R-Square)	
	B	SE	B					
(Constant)	25.63	9.43		2.72	.007			
2	Type of Institution	2.06	4.00	.08	.52	.606	2.61 (0.03)	0.03 (.02)
	father education	.64	.50	.10	1.28	.202		
	father occupation	-1.8	.70	-.49	-2.59	.010		
	average income per month	1.08	.58	.39	1.85	.065		

The results for regression analyses between type of institute and mean of socioeconomic determinants of the study (father's education, father's occupation, and father's income per month in Pakistani Rs.) and Flamingo Balance Test of school going children of the study is given in Table 2. Significance level revealed that type of institute and father education of the present study was good predictors of Flamingo Balance Test of the children at P-value is <0.05. Overall Results showed significant with very low effect in terms of F (P-value) 2.608 (0.036), R-square value and (Adjusted R-Square) 0.034 (0.021) respectively. The overall effect of socioeconomic determinants on Flamingo Balance Test in children is 3%. Scatterplot in figure 2 showing the relationship between type of institute, socioeconomic determinants and Flamingo Balance Test of Privat and Govt. school children. The final model of multiple regression analysis is as follows:

[Equation]

Figure 2

Scatterplot showing the relationship between type of institute, socioeconomic determents and Flamingo Balance Test of private and Govt. school children

Table 3

Regression analyses for Socioeconomic Determinants of the study and Flexibility (Sit and reach test) of Government and Private school going children

Model	Unstandardized Coefficients		Standardized Coefficients	T	P-value.	F (p-value)	R-Square (Adjusted R-Square)
	B	SE	B				
(Constant)	6.00	1.58		3.80	0.000		
Type of Institution	1.39	0.67	0.34	2.08	0.038	6.35 (.000)	0.08 (.06)
3 father education	0.07	0.08	0.07	0.90	0.366		
father occupation	-0.24	0.11	-0.38	-2.1	0.038		
average income per month	0.20	0.09	0.43	2.07	0.039		

The results for regression analyses between type of institute and mean of socioeconomic determinants of the study (father's education, father's occupation, and father's income per month in Pakistani Rs.) and Flexibility (Sit and Reach Test) of school going children of the study is given in Table 3. Significance level revealed that father education was not good predictor of Flexibility (Sit and Reach Test) of the children at P-value is >0.05. However, type of institute, father's occupation and father's income per month predicted significant of Flexibility (Sit and Reach Test) of children at significant $P \leq 0.05$. Overall Results showed highly significant but with very low effect in terms of F (P-value) 6.355 (0.00), R-square value and (Adjusted R-Square) 0.078 (0.066) respectively. The overall effect of socioeconomic determinants on Flexibility (Sit and reach test) in children is 8%. Scatterplot in figure 3 showing the relationship between type of institute, socioeconomic determinants and Sit and Reach Test of Private and Govt. school children. The final model of multiple regression analysis is as follows:

[Equation]

Figure 3

Scatterplot showing the relationship between type of institute, socioeconomic determents and Sit and Reach Test of private and Govt. school children

Table 4

Regression analyses for Socioeconomic Determinants of the study and Aerobic Endurance (6 min. run) of Government and Private school going children

Model	Unstandardized Coefficients		Standardized Coefficients	T	P-value.	F (p-value)	R-Square (Adjusted R-Square)
	B	SE	B				
(Constant)	221.13	108.46		2.04	0.04		
Type of Institution	184.28	46.00	0.56	4.00	0.00	35.43 (.00)	0.32 (.31)
7 father education	8.43	5.79	0.09	1.455	0.14		
father occupation	-16.67	7.99	-0.33	-2.08	0.04		
average income per month	10.17	6.69	0.27	1.519	0.13		

The results for regression analyses between type of institute and socioeconomic determinants of the study (father's education, father's occupation, and father's income per month in Pakistani Rs.) and Aerobic Endurance 6 Minute Run of school going children of the study is given in Table 4. Significance level revealed that mean of the socioeconomic determinants (father's education and father's income per month of the present study was not good predictors of Aerobic Endurance 6 Minute Run of the children at P-value is $>.05$. However, type of institute and Father's occupation predicted significant of Aerobic Endurance 6 Minute Run of children at significant $P < 0.05$. Overall Results showed highly significant with good effect in terms of F (P-value) 35.429 (0.000), R-square value and (Adjusted R-Square) 0.322 (0.312). The overall effect of socioeconomic determinants on Aerobic Endurance (6 min. run) in children is 32%. Scatterplot in figure 4 showing the relationship between types of institute, socioeconomic determinants and Aerobic Endurance 6-minute run of Private and Govt. school children. The final model of multiple regression analysis is as follows:

[Equation]

Figure 4

Scatterplot showing the relationship between type of institute, socioeconomic determents and Aerobic Endurance 6 minute run of private and Govt. school children

DISCUSSION

For private school going children, maximum number for father's education (n= 48, 36%) was Matriculation, followed by intermediate/FA/F.Sc degree holders (n= 40, 26.3%). Whereas for government school going children, father's education was maximally of primary level (n= 45, 29.6%) followed by Matriculation degree holders (n= 36, 23.7%) in the present study. Our results are in accordance with various population-based prevalence studies of physical fitness conducted for developing countries of the world such as Pakistan (Macera et al., 2005; Macniven, Bauman, & Abouzeid, 2012). A review on economic burden of PA in developing countries has clearly elucidated that the 3rd world countries (such as Pakistan) lay below the poverty line which hampers their socioeconomic standing ultimately leading to lesser levels of

education (Ding et al., 2016; Elfenbein, Schneider, Havlena, Chen, & Sippel, 2015; Saleem, 2019). This has been associated with rural and urban living as well and has been documented earlier that rural population has a lesser level of education as compared to urban populations. Results similar to ours have also been reported from Pakistan (Mahmood, Mujahid, Mahmood, Tariq, & Salam, 2018; Rizwan, Khan, Farooq, Khalid, & Ahmad). Hence, a decreased socioeconomic class could plausibly be attributed to lesser of education in fathers of government school-goers as compared to fathers of private school-goers. Indian researches also have mentioned similar results. If results on father's education of this study are tallied with our results attained for socioeconomic class, they will give an even clearer meaning. In our results, for private school-goers, upper middle class was dominant (n= 80, 52.6%) followed by the upper class (n= 65, 42.2%) whereas for government school-goers, upper lower class was dominant (n= 120, 78.9%) followed by the lower middle (n= 27, 17.8%). It is noteworthy to mention here that Pakistan has had a stagnant literacy rate of 60% for the last five years as depicted by the Economic Survey of Pakistan- 2020-21 being higher for urban population (74%) as compared to that for rural population (52%)(ESP, 2020-21). The difference in level of education in association with socioeconomic class have also been affirmed by Indian studies (D'souza & Avadhany, 2014; Das & Dhundasi, 2001).

Regarding the profession of fathers of school-going children, our results showed that for private school-goers, maximum number of fathers belonged to the profession of legislators (n= 57, 37.5%) followed by technicians and associate professionals (n= 53, 34.9%). On the other hand, for government school-goers, the fathers belonged to the elementary profession (n= 82, 53.9%). These results of our study again can be associated with the difference in socioeconomic class of both groups as discussed above and as ascertained by previous studies (D'souza & Avadhany, 2014; Das & Dhundasi, 2001; Fernando, Ravichandran, & Vaz, 2015).

This is noteworthy that this study was conducted upon reopening of schools after a long COVID pandemic lockdown. The Food and Agriculture Organization (FAO) and World Food Program (WFP) of the UNO conducted a survey on Food Security and Livelihood Assessment (FSLA) in Pakistan in 2020. Results of this report revealed that two-thirds of studied households were food insecure, with 48% of the households severely affected by the COVID pandemic. This led to a lowered socioeconomic profile and an ultimate decrease in per month incomes (ESP, 2020-21).

The results of the present study regarding monthly income in Pakistani Rupees showed that father's income per month for private school-goers was maximally (n= 69, 45.4%) in scale 10 (between 99931-199861) whereas it was maximally (n= 115, 75.7%) at scale 2 (between 10002-29972) for government schools. These results are in accordance with the report by the FAO/WFP on food security and lowered monthly income of households owing to COVID pandemic and its aftermath (Nafees & Khan, 2020; Noreen et al., 2020). Last few years in Pakistan have witnessed a soaring inflation with food and non-food inflation recorded at 14.1% and 8.9% as compared to 12.9% and 7.4% for last year, respectively. The inflation differential between rural and urban communities has been plausibly attributed to uncontrolled price checks in rural communities of Pakistan (ESP, 2020-21; Nafees & Khan, 2020; Noreen et al., 2020).

In the present study, in order to assess the level of predictability, regression analyses were tested for socioeconomic factors (type of institute, father's education, father's occupation, and father's income per month in Pakistani Rs.) and anthropometric attributes, and between socioeconomic factors and physical fitness attributes. Results of present revealed that none of the socioeconomic determinants of the present study were good predictors of height of the children. However, all these determinants predicted body weight and BMI of children. The socioeconomic class had the

highest predictability of 3% for body weight whereas type of institute had highest predictability of 8% for BMI. Furthermore, all of the socioeconomic determinants of the present study were good predictors of speed, aerobic endurance and flexibility of school going children. Highest predictability of 23% was noticed for father's income per month with strength of school going children.

Comparing the results of interrelationships attained in the present study with prior studies, it was revealed that extensive work has been reported globally on similar aspects with variable results depending upon the environment of the country, its financial stability, socioeconomic profile and global good-will standing (Hanifah et al., 2014; Martínez-Vizcaíno & Sánchez-López, 2008; Saygin, Zorba, Karacabey, & Mengutay, 2007; Syväoja et al., 2018). The socioeconomic and sociocultural factors can be considered as indicators for a positive relationship between motor development and material and social factors that directly affect the possibilities and suggestions for physical fitness. The groups of socio-economic factors deal with all influence scales of the family of the child, who is involved in the social and economic conditions. The differentiation in socio-economic conditions is substantive, for family, and social environmental (Aboshkair, Amri, Yee, & Samah, 2012; Cadenas-Sanchez et al., 2016; Das & Dhundasi, 2001). The most important socio-economic factor is the social status or social classes a global indicator physical fitness. Certain researchers have endorsed that cultural class rather than socioeconomic class is a far better predictor of physical fitness (Karim et al., 2015; Kuntzleman, 1993; Mahmood et al., 2018; Martínez-Vizcaíno & Sánchez-López, 2008).

CONCLUSION

The present study was conducted with an aim to determine effect of socioeconomic determinants on components (speed, endurance, flexibility, balance) of physical fitness of government and private schools' children. Experimental study design was used. The study was conducted on male children (n=304, 152 each from private and government schools) located within 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. The overall effect of socioeconomic determinants on speed (20 m sprint test) in children is 79%. The overall effect of socioeconomic determinants on Flamingo Balance Test in children is 3%. The overall effect of socioeconomic determinants on Flexibility (Sit and reach test) in children is 8%. The overall effect of socioeconomic determinants on Aerobic Endurance (6 min. run) in children is 32%. Finally, it was concluded that the socioeconomic determinants effect the speed and Aerobic Endurance in components of physical fitness of government school children but no effect on Balance and Flexibility.

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