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Health and physical fitness status of 12-14 years school going boys engaged in field games and e-games

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Abstract

Health is essential to achieve great success in education and future life. Active participation in physical education activity is extremely helpful to achieve good health and physical fitness among school boys. But at present the students became more engaged in computers and smart phone than outdoor activities. Many of the school children are engaged more in e-games. Present study was designed to put spotlight on the health and physical fitness issues among the school going children of two different categories. A total of 51 school going boys of mean age 13.56 years were selected randomly. The subjects were divided into G1 (field game group) and G2 (e-game group). Height, Weight, BMI, SSF, TSF and PBF were considered as Health criterion in this study and flexibility RGS, LGS, and MSE were considered as physical fitness criterion in this study. All parameters were measured using standard tools and equation in this study. Two independent group design was used in this study. Independent t-test was used to calculate the significance of difference between two group means. Only 0.05 level of significance was used in this study and all statistical calculations were done using standard statistical software (Excel, 2010). Findings revealed that the G2 boys have significantly higher body weight, BMI, SSF and percent PBF than the G1 boys whereas the G1 boys have significantly higher flexibility and MSE than the G2 boys. From the findings it was concluded that overall health status and physical fitness of G2 boys was significantly lower than the G1 boys.

Keywords: Health status, physical fitness, school going boys, field games and e-games

Introduction

Health is a state of total well-being in absence of disease and infirmity. In 1948, the World Health Organization (WHO) defined health as "Health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity." In 1986, the WHO further clarified that health is a resource for everyday life, not the objective of living. Health is a positive concept emphasizing social and personal resources, as well as physical capacities (WHO, 2006) [1]. Good health is essential for optimum study and is helpful to achieve great success in education and future life. Ill health and poor health status interrupt study and is the causes of several physical and mental problems. Participation in games and sports, especially team games not only helpful for development of different aspects of health but also very much important for all round development of personality among childhood. Physical wellbeing involves pursuing a healthful lifestyle to decrease the risk of disease. Developing physical fitness can protect and enhance the endurance ability, heart function, muscular strength, flexibility, and body composition of a student and also help to reduce the risk of a hypo kinetic diseases (Lawrence, 1932) [2].

Health includes not only the absence of diseases but physical fitness also. Physical fitness is considered as a pre-requisite to healthy and recreational living. It is considered a measure of the body's ability to function efficiently and effectively in work and leisure activities, to be healthy, to resist hyperkinetic diseases, and to meet emergency situations (Koutedakis and Bouziotas, 2003) [3]. Physical fitness is, more specifically, the ability to perform aspects of sports, occupations and daily activities which is generally achieved through proper nutrition, moderate-vigorous physical exercise, and sufficient rest. Physical fitness can be as much as health related which is used to preserves the health function of the body over extended periods of time. The objectives of physical education programmed aims at the maximal development of the individual's potentialities in all phases of life, by placing him in an environment

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which will promote the movement and related responses or activities that will best contribute to the good health (Felman, 2017) [4]. Active participation in physical education activity and sports is helpful to achieve physical fitness as well as good health among students. The students actively engaged in different games and sports are considered as subjects in this study. The games and sports played on the outdoor playground or indoor court which required a great amount of physical movements or exercises is considered as field games. During playing of these games their body systems functioned optimally - their respiratory rate increased, the heart rate increased and cardio-respiratory function enhanced to meet the demand of oxygen supply to the active muscles. This category includes all team games like Football, Volleyball, Basketball, Cricket, Kho-Kho, Kabaddi, Athletics etc. Regular participation of the school boys in this field games is extremely helpful to achieve good health and physical fitness. Due to the tremendous development of information and communication technology the all corners of our life is changed. Numbers of scientific and technological gadgets have been invented and intrude in our daily life. As a result life style has been changed, habits have been modified and relations turned customized. The desktops, Laptops, Tablets and the magical gadget-smart phone became the inseparable attachment with human life. The advancement of telecommunication industry provides different service to the people to access everything of the worlds in the drawing room. Incredible advancement of internet facility has shrinkage the world. The students became dependant more in their computers and smart phone than the outdoor activities. The web world created huge facility of video games in different form which attracted the school children more due to their colorful appearance, moving nature and virtual control by key board. The options to engage easily and playing lead role in these video games provide ample opportunity to them to attach mentally in these game. All these type of game available in web world or in internet which can be accessed by the any computer, laptop, tablet and smart phone are considered as E-games in this study.

E-Games or electronic games are those games played for any amusement or recreation in a stand-alone video game, desktop computer, laptop, tablet and smart phone with or without accessing the internet with one or more players (Computer desktop encyclopedia, 2017). A video game is the Electronic games which are involves interaction with a user inter face to generate visual feedback on a two or three dimensional video display device such as a touch screen, virtual reality headset or monitor/TV set. Since the 1980s, video games have become an increasingly important part of the entertainment industry, and whether they are also a form of art is a matter of dispute. The electronic systems used to play video games are called platforms. Video games are developed and released for one or several platforms and may not be available on others. Specialized platforms such as arcade games, which present the game in a large, typically coin-operated chassis, were common in the 1980s in video arcades, but declined in popularity as other, more affordable platforms became available. These include dedicated devices such as video game consoles, as well as general-purpose computers like a laptop, desktop or handheld computing devices (Newzoo Archived, 2019) [6].

Due to the spread of pandemic COVID-19 from the March, 2020 onward the school are closed throughout the lock down period. The study is conducting through online mode and going outside is restricted strictly. As a result students are

more engaged in virtual world and for this reason the engagement in various e-games among school students is increasing which might effects adversely on their health. The teen's health status become dwindles as they spend more time playing virtual games rather than having some physical exercise. This practice increases the health risk among childhood like obesity other health hazards. Sometimes, children also skip meals and sleep to play the e-games in which they are addicted. Constant glare from the screen for longer duration also harms the child's eyesight. However, younger students who have not yet developed the ability to self-regulate their behavior are effected more.

Though some studies have shown certain video games can improve hand-eye coordination, problem-solving skills, and the mind's ability to process information (Green, and Bavelier, 2003) [7]. But too much video game playing may cause problems. It's hard to get enough active play and exercise if someone is always engaged in playing e-games. This habit of engagement in e-game for a longer period of time not only effects adversely on their physical health but may change in their personality also. Several traits of the personality might be differing from the regular children who played outdoor games more than the e-games. Present study was designed to put spotlight on the health and physical fitness related issues among the school going children of two categories, one who are more engaged in e-games and other who usually played field game more.

Material and Methods

Subject

A total of 51 school going boys were selected randomly for this study. They were divided into two groups- Field game group (G1) and E-Game group (G2). G1 group had 26 subjects and G2 group had 25 subjects. The age of the subject was in between 12 to 14 years (Mean age 13.56 years). The boys who played any field games for at least 2.5 hour every day (Mean = 2.81 hours) and have minimum inter school level participation was considered as subjects for G1 and the school boys who were engaged in e-games either on mobile, laptop or desktop for at least 2.5 hour every day (Mean = 3.96 hours) were considered as the subjects of G2.

Criterion measure

Height, Weight, BMI, Sub-scapular skin folds (SSF), Triceps skin fold (TSF) and PBF were considered as Health criterion in this study. Whereas, flexibility, right hand grip strength (RGS), left hand grip strength (LGS), muscular strength-endurance (MSE) were considered as physical fitness criterion for this study.

Test and tools used

Health status was assessed by calculating BMI and body fat percentage (PBF) of the subject. The BMI was computed using standard equation and percent body fat was assessed by the equation developed by AAHPERD, 1984. Beside this, the measuring tape, weigh machine, skin fold caliper and hand grip dynamometer were used as tools in this study.

Design of the study and statistics used

The two independent groups design was followed in this study. Mean, standard deviation was used as descriptive statistics and independent t-test was used to calculate the significance of difference between two group means. Only 0.05 level of significance was used in this study and all statistical calculations were done using standard statistical

software (Excel, 2010).

Result and Findings

The criterion of health status includes height, weight, BMI,

different skin folds (SSF & TSF) and body fat percentage (PBF). The mean value of these parameters - height, weight, BMI, sub-scapular skin fold, triceps skin fold and PBF have presented in Table-1.

Table 1: Descriptive and inferential statistics for the health status parameters

Parameters selected	Statistical parameters	G1	G2	t-value	Remarks
Height	Mean (cm)	157.88	155.68	1.30	Not Significant
	SD	6.21	5.90		
Weight	Mean (kg)	51.27	56.44	2.34	Significant*
	SD	3.67	9.77		
BMI	Mean (kg/m ²)	20.45	23.15	4.66	Significant*
	SD	0.82	2.73		
SSF	Mean (mm)	16.88	18.96	2.56	Significant*
	SD	2.41	3.31		
TSF	Mean (mm)	20.33	22.34	1.81	Not Significant
	SD	3.46	4.39		
PBF	Mean (%)	30.86	32.40	2.37	Significant*
	SD	2.42	4.22		

* Only 0.05 level of significance was considered

Table-1 revealed that the mean value of the height for G1 and G2 group was almost same and computed t-value ($t=1.30$) indicated that the slight difference between the group means was not significant ($p>0.05$). But computed t-value ($t=2.34$) confirmed that the difference in mean values for weight between the G1 and G2 groups was significant statistically ($P<0.05$). Result also revealed that the difference in mean values for BMI between the two groups ($t=4.66$) was also significant statistically ($P<0.05$). The findings regarding height and weight of the G1 and G2 have presented

graphically in Figure-1.

Table-1 revealed that all the mean values for SSF, TSF and PBF of G1 group were lesser in compare to the G2 group. Table-1 have also shown that these difference in mean value between the G1 and G2 groups for SSF and PBF was significant statistically ($P<0.05$). However, the mean difference for TSF between G1 and G2 was not significant ($p>0.05$). The findings regarding skin folds and body fat percentage (PBF) of the G1 and G2 have presented graphically in Fig-1 & 2.

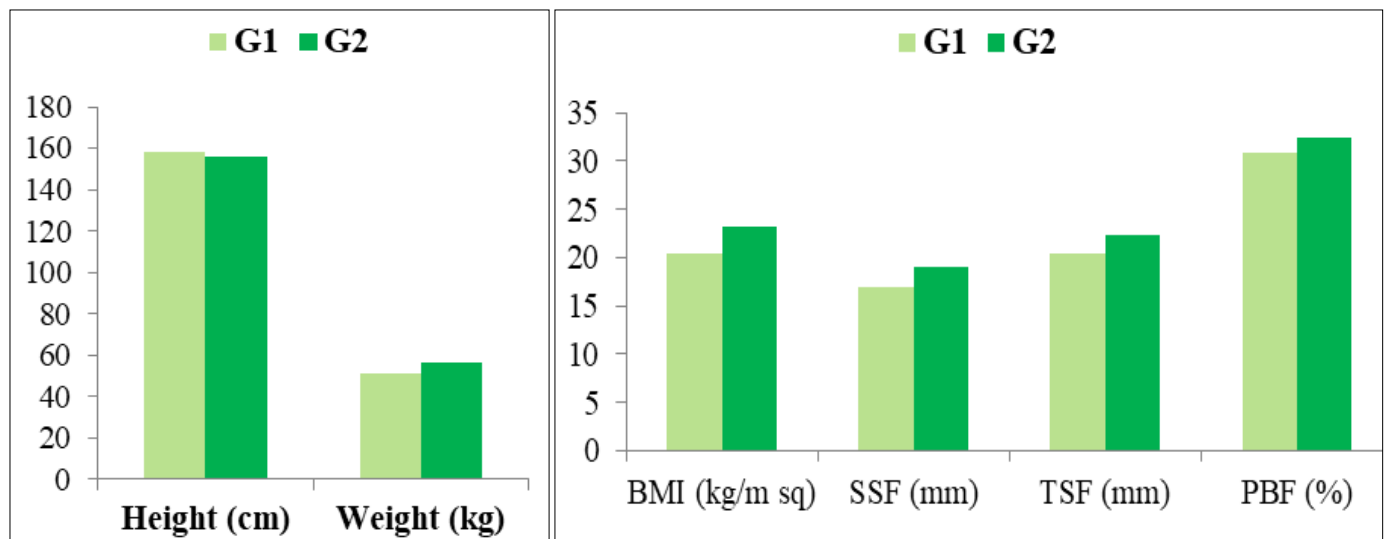


Fig 1 and 2: Comparison of height, weight, BMI, skin folds and PBF between G1 and G2

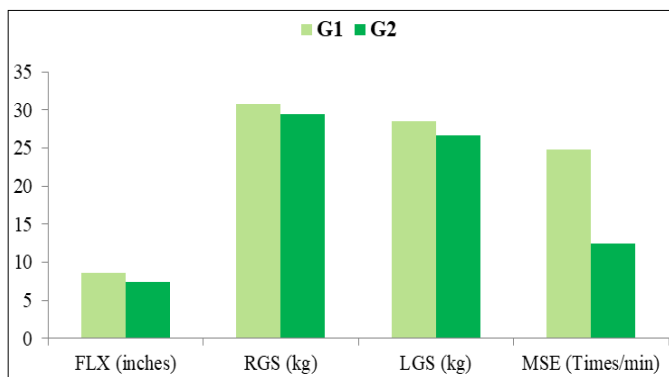
The physical fitness was assessed by measuring the flexibility (FLX), Right Grip strength (RGS), Left grip strength (LGS) and Muscular strength-endurance (MSE) of the subjects. The findings and result for these selected physical fitness parameters of the G1 and G2 have been presented in Table No-2. Table-2 revealed that the mean value of the FLX, RGS, LGS and MSE of G1 group were higher than the G2. Table-2 have also shown that the difference in mean value for the FLX and MSE between the two groups were significant statistically ($P<0.05$). However, the difference in mean values for RGS and LGS between the two groups were found not significant ($p>0.05$). The findings on physical fitness parameters for the two groups of subject have presented graphically in Figure-3.

Discussion on findings: Present study found no difference in the height between two groups of school boys but found the body weight was significantly differing between the G1 and G2 group. Not only that, study also reported that the difference among BMI ($t=4.66$, $P<0.05$) between the G1 and G2 was statistically significant. The mean value of the weight was more in G2 than G1 which indicated G2 have higher body weight. The higher value of BMI for G2 group (23.15Kg/m.sq) also indicating a tendency towards the overweight category. The skin fold measurement for SSF was found significantly higher in G2 than G1 indicating the higher accumulation of body fat under skin among G2. The finding for the other parameter PBF also indicated that the G2 have significantly higher amount of body fat percentage than their counterpart G1.

Table 2: Descriptive and inferential statistics for physical fitness parameters

Parameters selected	Statistical parameters	G1	G2	t-value	Remarks
FLX	Mean (In)	8.62	7.40	3.30	Significant*
	SD	1.42	1.22		
RGS	Mean (kg)	30.81	29.44	0.678	Not Significant
	SD	6.11	8.22		
LGS	Mean (kg)	28.5	26.68	0.901	Not Significant
	SD	6.5	7.82		
MSE	Mean (T/min)	24.77	12.48	12.17	Significant*
	SD	3.96	3.22		

* Only 0.05 level of significance was considered

**Fig 3:** Comparison of physical fitness status between the two groups

In respect of physical fitness parameters, present study have pointed out that the G2 group boys have less physical fitness in respect of G1 group. Among the selected parameters the flexibility (FLX) and the Muscular strength-endurance (MSE) were found significantly less in G2 in compare to the G1. The findings indicated an adverse effect of engagement in e-games among adolescent school boys on their health as well as physical fitness. The G2 boys have more body weight and more body fat in respect to the G1 because of their involvement in passive nature of engagement in physical activity. As the G2 boys have higher amount of fat in their body therefore the physical fitness performance were found lesser than the G1 boys. G1 boys were involved in field games and thus involve in regular physical exercises for which they have higher amount of physical ability and fitness. The G1 boys have lesser amount of body fat which also helped them to achieve higher performance in physical fitness test. More body weight among G2 boys indicated higher accumulation of body fat and excess body fat is disadvantageous to physical ability. Several study reported that the more fat mass is detrimental to the physical performance (González-Gross *et al.* 2003; Tyagi, 2001; Barbara *et al.* 2002; Mcleod, 1983) ^[8, 9, 10]. A negative and significant correlation was reported between VO₂ max and body fat % ($r = -0.702, P < 0.01$) by Marangoz and Var, 2018 ^[11]. Present study found that the G2 boys who engaged more in e-games have less physical fitness in compare to the G1 group boys who engaged more in physical exercise in the form of different field games. Several recent studies around the world reported engagement of mobile games and video games had an adverse effect on health (Naeem, 2014; Kapdi, Hoskote and Joshi, 2008; Abdus-salam, Elumelu and Adenipekun, 2008; Kesari *et al.*, 2013; Keykhosravi, *et al.*, 2018; Bauer *et al.*, 2019) ^[12-17].

Conclusions

On the basis of the above discussion the following conclusion

have been drawn:

1. The G2 boys have significantly higher body weight, Body mass index (BMI), Sub-scapular skin fold (SSF) and percent of body fat (PBF) than the G1 boys.
2. The G2 boys have significantly lower flexibility and muscular strength endurance (MSE) than the G1 Group boys.
3. Overall health status and physical fitness of G2 boys was found significantly lower than the G1 boys in the present study

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