CARDIO-RESPIRATORY FUNCTION, BODY COMPOSITION, ABDOMINAL MUSCULAR STRENGTH & ENDURANCE AND FLEXIBILITY OF PUNJAB STATE KANDI AND NON-KANDI AREA BOYS

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ABSTRACT

The present study investigated the cardio-respiratory function, body composition, abdominal muscular strength & endurance and flexibility of Punjab state Kandi and Non-Kandi area boys. In this study, the subjects for data collection were drawn from the different government schools of Kandi and Non-Kandi areas of Punjab state. Random sampling technique was used to select the subjects. The sample consisted of one thousand and fifty (N=1050) boys of Kandi and Non- Kandi area of Punjab state. To measure maximal functional capacity and endurance of the cardio-respiratory system of the subjects, the 9-Minute run test was applied. To evaluate the level of fatness in school age boys, the Skinfold Caliper was used. To assess the abdominal muscular strength & endurance of the subjects, modified sit-ups test was applied. Sit and reach test was used to evaluate the flexibility (extensibility) of the low back and posterior thighs of the subjects. The't' test was applied to find out the significant differences between Kandi and Non-Kandi area boys. To test the hypothesis, the level of significance was set at 0.05. The results showed that Kandi area boys 15-16 years (class 10th) exhibited significantly better maximal functional capacity & endurance, body composition and flexibility (extensibility) of the low back and posterior thighs than Non-Kandi area boys 15-16 years (class 10th). Similarly the Kandi area boys 15-16 years (class 10th) demonstrated better abdominal muscular strength & endurance than Non-Kandi area boys 15-16 years (class 10th) but not significantly.

Key Words: Cardio-respiratory function, Body composition, Abdominal Muscular Strength & Endurance, Flexibility, Kandi and Non-Kandi Area

INTRODUCTION:

Fitness is a condition in which an individual has sufficient energy to avoid fatigue and enjoy life. It is necessary for elderly people to maintain and improve their physical fitness in order to satisfy

healthy, high quality of daily life (Tanaka et al., 2004). Skill-related physical fitness refers to an individual's athletic ability in sports such as tennis and encompasses skill-related attributes like dynamic balance, power, speed and agility; the health-related aspect is a measure of cardiovascular endurance, muscle strength, endurance and flexibility and body composition (Hopkins & Walker, 1988). Physical fitness is measured by functional tests that are specific and usually normative-based, rather than criterion-based, thereby leaving unanswered as to how much of a specific fitness factor (e.g. muscular endurance) is required for a good quality of life (Chia et al., 2007). There are numerous factors which are responsible for the performance of sportsmen. The physique and body composition including the size, shape and form are known to play a significant role in this regard (Sodhi & Sidhu, 1984). Fitness can be described as a condition that helps us look, feel and do our best. More specifically, it is "The ability to perform daily tasks vigorously and alertly, with energy left over for enjoying leisure-time activities and meeting emergency demands. It is the ability to endure, to bear up, to withstand stress, to carry on in circumstances where an unfit person could not continue, and is a major basis for good health and well-being" (Singh, 2001). Fitness improves general health and it is essential for full and vigorous living. The physically fit child feels more alert and eager to do things. A weak child is a weak brick in the wall of the nation. The wealth of a nation depends entirely upon the health of every citizen of the country. Hence physical fitness of school children is major factor to be considered. So, school physical education programmes should include multifarious activities appropriate to each age group.

Health-related fitness refers to the state of physical and physiological characteristics that define the risk levels for the premature development of diseases or morbid conditions presenting a relationship with a sedentary mode of life. However, the degree of development of each varies with the type of physical activity. Rink (1985) is of the view that cardio-vascular endurance is a key factor in health related fitness and is important to many sports performances and related activities. Body composition is also an important area in heath related fitness. Knowledge of body composition provides an excellent opportunity to teach the students, the role of direct exercise in the maintenance of proper body weight and its effect on obesity and disease. Uppal et al. (1984) stated that body composition to be a vital factor along with physical fitness components which contribute to athletic performance. Flexibility is a health related component of physical fitness that relate to

the range of motion available at a joint. It helps in synchronizing the various movements. It has been a common belief that a high degree of flexibility is necessary in all endeavors. Greater amount of flexibility decreases the expenditure of energy and reduces the resistance while performing gymnastic movements (Hellenic Olympic Committee, 1970). The area of investigation under present study was Kandi and Non- Kandi area of Punjab state. The area lying on the North-East of the motelled road running from Chandigarh to Pathankot via SahibzadaAjit Singh Nagar, Roopnagar, Balachaur, Garshankar, Hoshiarpur, Dasuya, Mukerian and Dharkalan block in Gurdaspur District is Sub-Mountain area (Govt. of Punjab, 1973). A large parts of Punjab constituent the plains. It is situated south of mountainous area. It comprises the districts; Amritsar, Barnala, Bathinda, Faridkot, Fatehgarh Sahib, Firozepur, Jalandhar, Kapurthala, Ludhiana, Mansa, Moga, Mukatsar, Patiala, Sangrur and TarnTaran. The parts of five districts such as Sahibzada Ajit Singh Nagar, Roopnagar, Shaheed Bhagat Singh Nagar, Hoshiarpur and Gurdaspur falls under Kandi and Non - Kandi areas. Therefore, the present study was conducted to investigate the cardio-respiratory function, body composition, abdominal muscular strength & endurance and flexibility of Punjab state Kandi and Non-Kandi area boys.

MATERIALS AND METHODS:

Sample:

In this study, the subjects for data collection were drawn from the different government schools of Kandi and Non-Kandi areas of Punjab state. Random sampling technique was used to select the subjects. The sample consisted of one thousand and fifty (N=1050) boys of Kandi and Non- Kandi area of Punjab state.

The break- up of total sample is shown in the table below:

1050 Subjects (Kandi and Non- Kandi areas)	
Kandi Area Boys=525	Non-Kandi Area Boys=525

Selection of variables:

To measure maximal functional capacity and endurance of the cardio-respiratory system of the subjects, the 9-Minute run test was applied. To evaluate the level of fatness in school age boys, the Skinfold Caliper was used. To assess the abdominal muscular strength & endurance of the subjects,

modified sit–ups test was applied. Sit and reach test was used to evaluate the flexibility (extensibility) of the low back and posterior thighs of the subjects. The't' test was applied to find out the significant differences between Kandi and Non- Kandi area boys. The level of significance was set at 0.05.

RESULTS:

Table-1

Significant differences in the mean scores of Kandi and Non-Kandi area boys (15-16 years class 10th) on the variables; cardio-respiratory function, body composition, abdominal muscular strength & endurance and flexibility

	Kandi Area Boys=525		Non-Kandi Area Boys=525					
Variables	Mean	SD	Mean	SD	Mean Difference	SEDM	t-value	Sig.
Cardio-respiratory function	938.371	145.964	816.800	161.193	121.571	15.658	7.764*	000
Body composition	14.264	3.575	14.922	3.527	-.658	0.219	3.002*	003
Abdominal muscular strength & endurance	30.979	6.519	30.535	6.817	.444	0.412	1.078	281
Flexibility	8.982	4.681	8.367	4.964	.616	0.297	2.067*	039

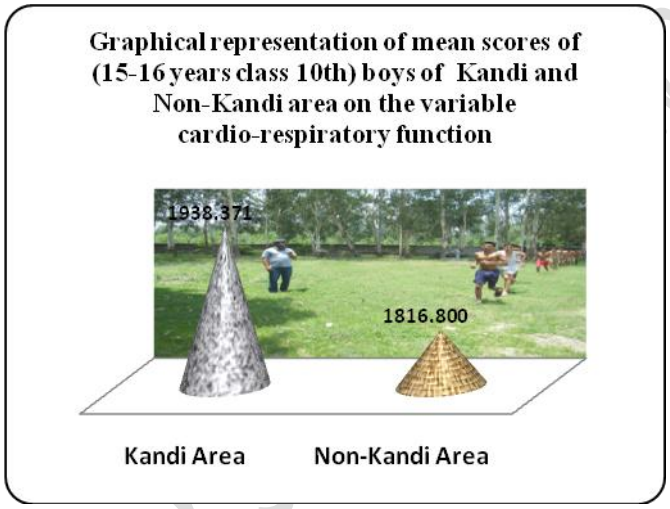
*Significant at 0.05 level Degree of freedom= 1048

Cardio-respiratory function

Table-1 presents the results of variable cardio-respiratory function related to Kandi and Non-Kandi area boys (15-16 Years Class 10th). The descriptive statistics shows the Mean and SD values of

Kandi area as 1938.371 and 245.964 respectively. However, Non-Kandi boys had Mean and SD values as 1816.800 and 261.193 respectively. The Mean Difference and Standard Error Difference of Mean were 121.571 and 15.658 respectively. The't'-value 7.764 as shown in the table above was found statistically significant (P<.05). It has been observed from the above results that Kandi area boys have demonstrated better on maximal functional capacity & endurance of the cardio-respiratory system than Non-Kandi area boys. The comparison of mean scores of both the groups has been presented graphically in figure-1.

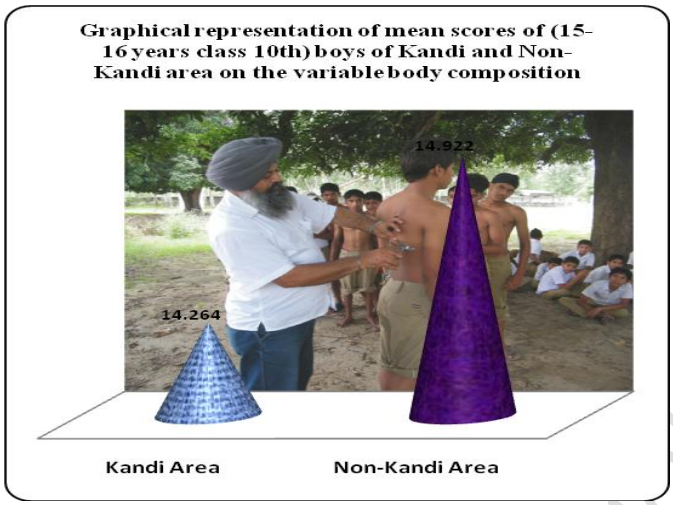
Figure: 1



Body composition

Table-1 depicts the results of the variable body composition between Kandi and Non-Kandi area boys (15-16 Years Class 10th). The Kandi area boys had Mean value 14.264 and SD value 3.575. However, Non-Kandi area boys had Mean value 14.922 and SD value 3.527. The Mean Difference and Standard Error Difference of Mean were -.658 and 0.219 respectively. The't'-value -3.002 as shown in the table above was found to be significant (P<.05). It has been observed from above results that Kandi area boys had significantly lesser Fat level than Non-Kandi area boys. The comparison of mean scores of both the groups has been presented graphically in figure-2.

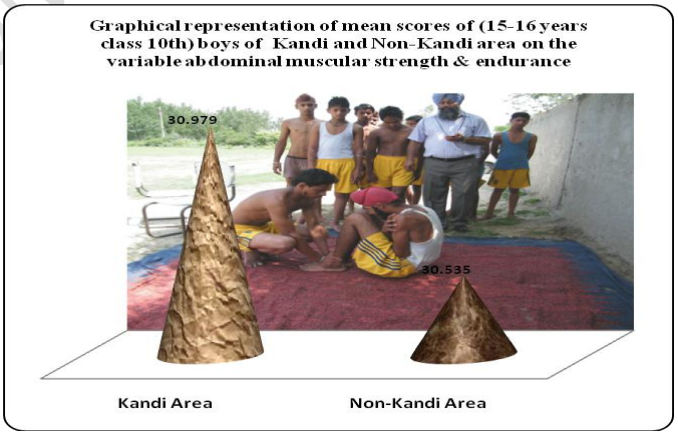
Figure: 2



Abdominal muscular strength & endurance

Table-1 shows the results of variable abdominal muscular strength & endurance related to Kandi and Non-Kandi area boys (15-16 Years Class 10th). The descriptive statistics shows the Mean and SD values of Kandi area as 30.979 and 6.519 respectively. However, Non-Kandi area boys had Mean and SD values as 30.535 and 6.817 respectively. The Mean Difference and Standard Error Difference of Mean were .444 and 0.412 respectively. The 't'-value 1.078 as shown in the table above was found insignificant (P>.05). While comparing the mean values of both the groups, it has been observed that boys of Kandi area have demonstrated better abdominal muscular strength and endurance as compared to Non-Kandi area boys but not significantly. The comparison of mean scores of both the groups has been presented graphically in figure-3.

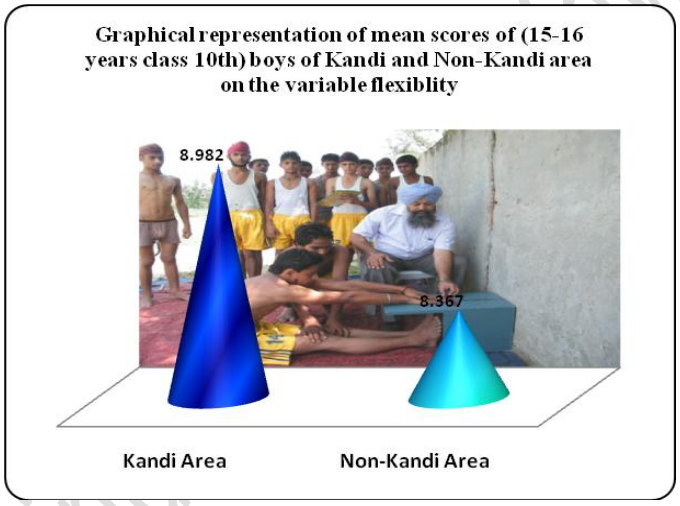
Figure: 3



Flexibility

Table-1 reveals the results of variable flexibility related to Kandi and Non-Kandi area boys (15-16 Years Class 10th). The descriptive statistics shows the Mean and SD values of Kandi area as 8.982 and 4.681 respectively. However, Non-Kandi area boys had Mean and SD values as 8.367 and 4.964 respectively. The Mean Difference and Standard Error Difference of Mean were .616 and 0.297 respectively. The't'-value 2.067 as shown in the table above was found significant (P<.05). It has been observed that Kandi area boys have exhibited significantly better flexibility (extensibility) of the low back and posterior thighs than Non-Kandi area boys. The comparison of mean scores of both the groups has been presented graphically in figure-4.

Figure: 4



DISCUSSION:

It is evident from table-1 with regard to 15-16 years (class 10th) boys on the variables; cardio-respiratory function, body composition and flexibility between Kandi and Non-Kandi area boys. Kandi area boys have performed significantly better on maximal functional capacity & endurance of cardio-respiratory system, lesser level of fatness and significantly better flexibility (extensibility) of the low back and posterior thighs. However, no significant difference has been observed on abdominal muscular strength & endurance between boys of Kandi and Non-Kandi area as both the groups have performed equally well on the said variable. But a microscopic look at mean values revealed that boys of Kandi area have performed better on abdominal muscular strength and

endurance than Non-Kandi area boys. The results could be attributed to the better general fitness of Kandi area boys as it has been observed that most of the boys of this area either walk down few kilometres or have to ride cycles to reach their schools due to lack of transportation facilities. This might have facilitated the Kandi area boys to do well on the task at hand. It is also believed that the people living in hilly areas have to face more manual work, walking, cycling and carrying loads are essential components of their ordinary day to day life as compared to people staying in plains. Glaner (2003) revealed that higher and moderate levels of aerobic endurance, flexibility, muscular strength/endurance, and desirable body fat levels, are very important for promoting health at all ages, and to avoid early development of chronic diseases. Jan Percival et al. (1982) concluded that every individual has different level of fitness, which may change from time to time, it may also change from place to place and sometimes it may changes with work or situation also. On the contrary Malina (2001) did not find an association between physical activity and muscle strength, flexibility or body composition; even though one of the outcomes considered to be developed with physical activity is muscle strength. The correlations between fitness variables were also modest (except for the flexibility measures), indicating that each variable is measuring a relatively unique aspect of fitness.

CONCLUSION:

It is concluded from the above results that Kandi area boys 15-16 years (class 10^{th}) exhibited significantly better maximal functional capacity & endurance, body composition and flexibility (extensibility) of the low back and posterior thighs than Non-Kandi area boys 15-16 years (class 10^{th}). Similarly the Kandi area boys 15-16 years (class 10^{th}) demonstrated better abdominal muscular strength & endurance than Non-Kandi area boys 15-16 years (class 10^{th}) but not significantly.

References:

Chia, M. (2007). Fit to play: enabling play and physical activity in children. In: The power of movement enhancing children's cognitive, social & emotional and physical development through movement. Nonis K & Daswani S (eds) Pearson Education Asia, Singapore. pp: 112-128.

Govt. of Punjab Letter No. 322-SMAC-1(1AC) 72/119 dated January 16, 1973).

Hellenic Olympic Committee. (1970). Report of the 18th Session of International Olympic Academy, at Olympic.

Hopkins, W.G & Walker, N.P. (1988). The meanings of physical fitness. Preventive Med. 17,764–773.

Percival, J., Percival, L., & Taylor, J. (1982). The complete guide to total fitness. A & C Black Publ. Ltd. pp: 224.

Rink, J.E. (1985). A Teacher Physical Education Learning. Saint-Louis: Times Mirror/ Mosby College Publishing.

Singh, A., Gill, J.S., Brar, R.S., Rathee, N.K., & Bains, J. (2001). Modern Text Book of Physical Education, Health and Sports. Kalyani Publishers.

Sodhi, H.S. & Sidhu, L.S. (1984). Physique and selection of sportsmen – a Kinanthropometric study. Patiala Publ. House, Patiala.

Tanaka, K., Nakamura, Y., & Sakai, T. (2004). Role of exercise science in maintaining overall quality of life in humans. Japan J. Phys. Educ. Hlth. Sport Sci. 49, 209-229.

Uppal, A.K., Dey, R.N., & Singh, R. (1984). Relationship of Body Composition and Anaerobic Power of Physical Education Students Belonging to Different Weight Categories. SNIPES Journal, 6, (4), pp. 31-35.