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Relationship between measured and perceived body mass index in special population of Karnataka state

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Abstract

Proper nutrition, physical warming-up exercise, structured conditioning and ample rest are the key to maintain physical fitness. Disabled population are one of the most disenfranchised groups in India. Standardized measurements of disability in India and globally have overlooked the linkages between the wealth and disability. The purpose the study was to measure the body mass index of visually as well as hearing impaired residential school children of Karnataka State. Further the level of perception on body mass index was also correlated with their actual status. A total of 414 subjects with special needs were selected for the present study through purposive random sampling technique. The study included hearing impaired (N=171) and visually impaired (N=243) in male category. All the subjects were residents of special schools within Karnataka state. Their age ranged between 13 to 18 years. The height and weight were measured with standard procedure including pre calibrated equipment. The Body Mass Index was calculated using the formula $BMI = \text{Kilograms} / \text{Meter}^2$. The researcher gave a brief overview of body mass index in order to make them familiar and express their levels of perception. The data from visually impaired students was collected through dictation and response record method. Similarly, data from hearing impaired students was collected through sign language method with help of a trained helper. The data was collected at the residential schools with prior intimation and permission. Pearson product moment correlation was used a statistical tool apart from descriptive statistics like mean and standard deviation. In special population of 13 to 14 years 39.06 per cent were severely thin, in 15 to 16 years it is observed that 21.59 per cent of them were severely thin, and in 17 to 18 years it is found that 11.82 per cent were severely thin. Underweight rather than over weight was found to be a matter of concern in special population under investigation. Further, the Levels of perception on body mass index showed significantly weak positive linear relationship in 13 to 14 years group; moderate positive linear relationship in 15 to 16 years and 17 to 18 years group when correlated with actual body mass index.

Keywords: Special population, disabilities, visually impaired, hearing impaired, physical activity

Introduction

Daily physical fitness activity is the solution for the healthy life. Perform the regular physical activities we need fine health, to be fit and fine and achieve daily activities which may be our sporting activity or one professional duties or it may be daily routine work in our home. Proper nutrition, physical warming-up exercise, structured conditioning and ample rest are the key to maintain physical fitness.

Disabled population are one of the most disenfranchised groups in India. Standardized measurements of disability in India and globally have overlooked the linkages between the wealth and disability (Hiranandani and Sonpal, 2010) [4]. In this era of liberalization, privatization and globalization, the need for the study on the persons with disabilities is increasing. The study on the women and children with disability and on the person with severe disabilities and their social, educational, economic, employment, sports and cultural activities is the need of the hour. Generally, human rights, legislations laws and Judgments of the courts are considered whenever the study on disabled people is conducted. The rights of the people with disabilities can be very well considered as human right due to the implementation of convention on rights of disabled people (Gazette of India, 2016) [1]. According to the most recent Physical Activity and Health: A Report of the Surgeon General (USDHHS, 1996) [11], physical inactivity is a major health concern for all, but individuals with disabilities are at a higher risk of developing sedentary lifestyles.

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Health is the fundamental right of every individual. Health is essential for basic human needs and satisfaction, for improved quality of life. It is not just an escape from death or for matter, escape from disease, rather it is a harmony among the physical, mental and social aspects of an included for the attainment of health (Naveen and Reddy, 2010) [6]. Obesity and overweight are at present important health problems disturbing school-age students. Overweight children are more likely to become overweight adults and have greater risk of obesity in adulthood than normal weight children (Haskell *et al.*, 2007) [3]. Overweight is one of the huge public concerns for the reason that it is related to diabetes, hypertension, and cardiovascular disease in adulthood and these are leading causes of death (Guo *et al.*, 1994) [2]. Overweight and underweight children are at risk for a variety of health problems, making early identification of their weight status important. Eating disorders such as anorexia, bulimia and binge eating can result in both serious long-term health problems and poor school performance. Overweight and obesity in children and adolescents are risk factors for a variety of serious health conditions such as Type 2 Diabetes and cardiovascular disease (Patrick, 2014) [7]. Several countries in South-East Asia as well as India are going through an economic and nutrition transition. The nutrition changeover is associated with modified in nutritional habits, declining physical activity and growing prevalence of obesity. Heavy weight and fatness are main risk factors for a number of chronic health problems, including cancer, cardiovascular diseases and diabetes. Fatness in children and young generation is slowly becoming a main public health problem in many up-coming countries, as well as India. 'One-half of fatty school going children become fatty adults. However, whether or not obesity persists into young generation, obesity in childhood appears to increase the risk of subsequent morbidity. Significance of estimating prevalence of childhood obesity thus cannot be over emphasized. Few studies in India are reporting prevalence of childhood and young generation obesity and heavy weight from different areas of India that range from three per cent to twenty nine per cent, and also point out that the prevalence is superior in urban than in rural areas. However, there is no published data on a representative sample from Pondicherry on prevalence of childhood obesity. With current rise in number of diabetics 5.04 per cent and hypertensive in the Union Territory of Pondicherry, it was essential to have the accurate data on prevalence of childhood obesity and therefore an effort was made to measure the prevalence of heavy weight and obesity among school children aged between six to twelve years (Mahajan *et al.*, 2011) [5].

The objective of the study

The purpose the study was to measure the body mass index of visually as well as hearing impaired residential school children of Karnataka State. Further the level of perception on body mass index was also correlated with their actual status.

Methodology

A total of 414 subjects with special needs were selected for

the present study through purposive random sampling technique. The study included hearing impaired (N=171) and visually impaired (N=243) in male category. All the subjects were residents of special schools within Karnataka state. Their age ranged between 13 to 18 years.

The height measurement was done by following the standard procedure (Stewart and Marfell-Jones, 2001) [9]. The height of an individual was measured by using an instrument called (Indosurgicals portable stadiometre) stadiometer. The heavy outer garments, hair ornaments and shoes were removed before taking the height measurement of an individual and then made to stand by keeping their arms hanging naturally by the side of the body and kept their heel, buttocks and upper part of the back with vertical bar and look straight ahead along the pole of the stadiometer. They were placed their head in Frankfort plane and maintain the normal breathing. The head piece of the stadiometer bar and the sliding part of the measuring rod was lowered up to the top of the head of an individual. The researcher took the height measurement from the floor to the highest point of the head and the reading was recorded in meters. The weight measurement was carried out by following the standard protocol. Before taking the weight measurement, an individual was asked to remove their outer covering except shorts. An individual was made to stand on the electronic digital weighing machine (Ozeri pro max digital weighing machine) and stood erect over the centre of the machine with distributed their body weight evenly on both the feet. An individual was made to keep their arms hanging freely on either side of the body with palm facing the thigh and stood with face foreword without any movement and normal breathing and the score was recorded in kilograms. The body mass index of an individual was calculated by using the following formula $BMI = \text{Kilograms} / \text{Meter}^2$. Levels of perception on body mass index of hearing as well as visually impaired subjects was done using a three point likert scale. The subject was asked to rate his body mass index on a questionnaire wherein he was given to tick one of the three options *viz* a) Higher than the normal b) Normal or c) lower than the normal. The response given by the subject was purely based on the perception of the subject under investigation (Rahmani-Nia, *et al.*, 2011) [8]. The researcher gave a brief overview of body mass index in order to make them familiar and express their levels of perception. The data from visually impaired students was collected through dictation and response record method. Similarly, data from hearing impaired students was collected through sign language method with help of a trained helper. The data was collected at the residential schools with prior intimation and permission. Pearson product moment correlation was used a statistical tool apart from descriptive statistics like mean and standard deviation.

Findings of the study

Descriptive statistics including mean and standard deviation were employed to the raw data collected on body mass index of the subjects selected for the study. The results are provided in table 1.

Table 1: Descriptive Results on Characteristics of Special Population

Variable	Units	13 to 14 years	15 to 16 years	17 to 18 years
		Mean \pm S. D	Mean \pm S. D	Mean \pm S. D
N		128	176	110
Age	in years	13.45 \pm 0.50	15.45 \pm 0.50	17.45 \pm 0.50
Height	in meters	1.50 \pm 0.09	1.56 \pm 0.08	1.59 \pm 0.07

Weight	in kilograms	38.46 ± 7.47	44.56 ± 8.98	47.93 ± 9.82
B. M. I	As per formula	17.08 ± 2.52	18.21 ± 2.81	18.94 ± 3.15

\bar{x} = Mean S.D = Standard Deviation

Analysis of the table 1 reveals that the age of special population under investigation was 13.45 ± 0.50 in (the first score indicates mean followed by standard deviation) 13 to 14 years; 15.45 ± 0.50 in 15 to 16 years and 17.45 ± 0.50 in 17 to 18 years. The height was 1.50 ± 0.09 in 13 to 14 years; 1.56 ± 0.08 in 15 to 16 years; and 1.59 ± 0.07 in 17 to 18 years. The

weight was 38.46 ± 7.47 in 13 to 14 years; 44.56 ± 8.98 in 15 to 16; years and 47.93 ± 9.82 in 17 to 18years. The body mass index was 17.08 ± 2.52 in 13 to 14 years; 18.21 ± 2.81 in 15 to 16 years; and 18.94 ± 3.15 in 17 to 18years. Table 2 provides results on Body Mass Index of special population with reference to available norms.

Table 2: Norms based results on body mass index of special population in Karnataka

Normative values	Normative category	13 to 14 Years		15 to 16 Years		17 to 18 Years	
		F	%	F	%	F	%
Below 16	Severe thinness	50	39.06	38	21.59	13	11.82
16.00 to 16.99	Moderate thinness	26	20.31	31	17.61	13	11.82
17.00 to 18.49	Slight thinness	24	18.75	36	20.45	28	25.45
18.50 to 24.99	Normal	26	20.31	66	37.50	49	44.56
25.00 to 29.99	Over weight	2	1.56	5	2.84	6	5.45
30.00 to 34.99	Obese	0	0	0	0	1	0.90
Total		128		176		110	

F= frequency, %=Percentage

Perusal of table 2 depicts that in special population of 13 to 14 years 39.06 per cent were severely thin, 20.31 per cent moderately thin, 18.75 per cent slightly thin, 20.31 per cent normal, 1.56 per cent over weight and none of the subjects was obese. In special population of 15 to 16 years it is observed that 21.59 per cent of them were severely thin, 17.61 per cent moderately thin, 20.45 per cent slightly thin, 37.50 per cent normal, 2.84 per cent over weight and none of the subjects was obese. Further, in special population of 17 to 18

years it is found that 11.82 per cent were severely thin, 11.82 per cent moderately thin, 25.45 per cent slightly thin, 44.56 per cent normal, 5.45 per cent over weight and 0.90 per cent obese. The norms for the present per cent analysis were obtained from (World Health Organization, 2009). Table 3 provides information on relationship between perceived body mass index and actual body mass index of special population in the age group 13 to 14 years. The above results are graphically depicted in figure 1.

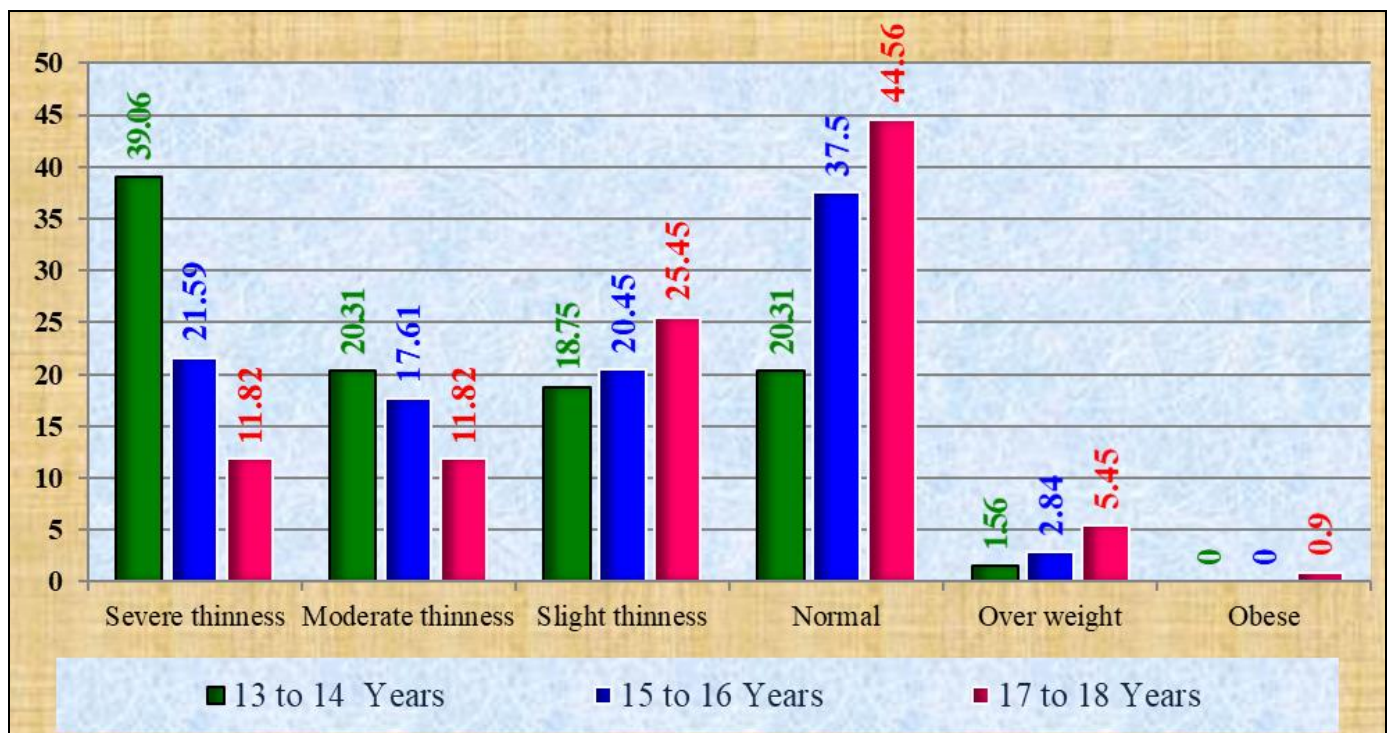


Fig 1: Norms based results on body mass index of special population of Karnataka

Table 3: Correlation between perceived and actual body mass Index in 13 To 14 Years

		Actual Body Mass Index
Perceived Body Mass Index	Pearson Correlation	.289**
	Sig. (2-tailed)	.001
	N	128

** . Correlation is significant at the 0.01 level (2-tailed).

Perusal of table 3 reveals that the levels of perception on body mass index showed significantly weak positive linear relationship when correlated with actual body mass index in special population of age 13 to 14 years. Table 4 provides information on association between perceived and actual body mass index of special population in the age group 15 to 16 years.

Table 4: Correlation between perceived and actual body mass index in 15 To 16 Years

		Actual Body Mass Index
Perceived Body Mass Index	Pearson Correlation	.440**
	Sig. (2-tailed)	.000
	N	176

** . Correlation is significant at the 0.01 level (2-tailed).

Table 4 clearly depicts that the Levels of perception on body mass index showed significantly moderate positive linear relationship when correlated with actual body mass index in special population of age 15 to 16 years. Table 5 provides information on association between perceived and actual body mass index of special population in the age group 17 to 18 years.

Table 5: Correlation between perceived and actual body mass index in 17 To 18 Years

		Actual Body Mass Index
Perceived Body Mass Index	Pearson Correlation	.577**
	Sig. (2-tailed)	.000
	N	110

** . Correlation is significant at the 0.01 level (2-tailed).

Table 5 reveals that the Levels of perception on body mass index showed significantly moderate positive linear relationship when correlated with actual body mass index in special population of age 17 to 18 years.

Discussion

In 13 to 14 years, (39.06%) of special population in Karnataka had body mass index below 16 and were considered severely thin; (20.31%) were moderately thin; (18.75%) were slightly thin. In 15 to 16 years, (21.59%) of were severely thin; (17.61%) were moderately thin; (20.45%) were slightly thin. In 17 to 18 years, (11.82%) were severely thin; (11.82%) were moderately thin; (25.45%) were slightly thin. The results of the study make it clear that a large number of subjects were underweight as per the available norms. Similar results were found in a study by (Touq and Al-Rahamneh, 2015) ^[10] which assessed the prevalence of obesity among blind children in the middle region of Jordan. Most blind children had a percentage body fat below and within the normal range. The reasons for the present observed under weight problem may be linked to poor diet in the special schools. The subjects are not being provided enough nutrients for growth and development of the body, especially protein. The underweight may eventually lead to other problems like brittle bones, functional disability etc. reason for underweight among special school children of Karnataka. In 13 to 14 years, levels of perception on body mass index showed significantly weak positive linear relationship when correlated with actual body mass index in special population of Karnataka. In 15 to 16 years, levels of perception on body mass index showed significantly moderate positive linear relationship when correlated with actual body mass index in special population of Karnataka. In 17 to 18 years, levels of perception on body mass index showed significantly moderate positive linear relationship when correlated with actual body mass index in special population of Karnataka. The present study reveals the fact that the subjects under investigation are aware of their health status in terms of body mass index. In spite of this awareness the subjects have not taken any measure to correct under weight problem prevalent in them. It is also observed that the age is a

significant factor which can make them more informed regarding their present body mass index status.

Conclusion

Underweight rather than over weight was found to be a matter of concern in special population under investigation. Further, the Levels of perception on body mass index showed significantly weak positive linear relationship in 13 to 14 years group; moderate positive linear relationship in 15 to 16 years and 17 to 18 years group when correlated with actual body mass index.

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