



ISSN: 2456-0057  
IJPNE 2019; 4(1): 106-108  
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www.journalofsports.com  
Received: 07-11-2018  
Accepted: 09-12-2018

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## Body mass index status among children with intellectual disability

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### Abstract

**Context:** Individuals with intellectual disability (ID) have certain limitations in mental functioning and experience poorer health as compared to general population. The adults with ID have a high risk of developing obesity, and women with ID have a high risk of developing morbid obesity

**Objective:** The objective of this study was to assess the prevalence of obesity among children aged 12-15 years.

**Method:** All intellectually disabled children between 11 to 15 years old attending special education schools in Pune, Maharashtra were included in the study. Two hundred twenty-five children (83 females and 142 males) were participated in this study. There was no age difference between male (Mean=12.36 years, SD=1.51) and female (Mean=12.61 years, SD=1.63). The degree of intellectual disability of participants ranged from mild to severe based upon the IQ records available in school. A non-stretching metric tape-measure was used to determine Participants height. Height was measured in centimeters (cms) using a custom-made 3.5 metre wooden ruler and weight was measured in kilograms using a digital weighing scale which give a reading of weight in kilograms to one decimal place. Body Mass Index was calculated using Quetelet's ratio.

**Results:** The total sample, as well as male and female respondents, was classified into one of the three groups based on their BMI rating: that is, overweight, normal weight, and underweight. In the total sample, 6.2% of participants were overweight, 23.11% normal weight, and 70.22% were underweight. The results help to interpret that majority of children with ID were underweight.

**Conclusion:** Children below 15 years of age having ID seems to be underweight.

**Keywords:** ID, BMI, obesity, underweight

### 1. Introduction

Individuals with intellectual disability (ID) have certain limitations in mental functioning and experience poorer health as compared to general population. Among individuals with ID, higher body mass index is associated with various metabolic disorders<sup>[1, 2, 3]</sup> and hypertension.<sup>[4, 5]</sup> Additionally, it has been found that adults with ID have a high risk of developing obesity, and women with ID have a high risk of developing morbid obesity<sup>[6]</sup>. Overall, the rates of obesity in individuals with ID is quite high and number of countries have indicated an increase risk of obesity in these people<sup>[7, 8]</sup>. Prevalence of being overweight and obese among adults with ID is reportedly 28% to 71% and 17% to 43%, respectively. The major reasons for susceptibility of being overweight or obese have been found to be increasing age, mild intellectual disability, as well as living independently/with family, consuming certain medications, and non-participation in physical activities<sup>[9]</sup>. Compared to the general population the individuals with ID engage in less than the recommended amount of physical activity<sup>[10, 11, 12, 13]</sup>. In fact, the impact of overweight on the lives of people with ID is found to be greater as compared to the general population. The consequences of obesity predispose adults with ID to greater risk of secondary risk factors such as low physical activity, lack of social support<sup>[14]</sup>.

Several studies have reported prevalence of obesity among people with ID however, few studies reported that adults with profound intellectual disability tended to be underweight (Wallen & Roszkowski, 1980)<sup>[15]</sup>. Further, Lloyd *et al.*, (2014) reported that the low-income countries had higher rates of underweight and the high-income countries had higher rates of obesity<sup>[16]</sup>.

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The research findings in relation to obesity, overweight and underweight among people with ID found to be contrasting. Further, there are very few studies conducted in children with ID reporting status of obesity. Therefore, the main objective of this study was to assess the prevalence of obesity among children aged 12- 15 years.

## 2. Method

### 2.1 Participants

All intellectually disabled children between 11 to 15 years old attending special education schools in Pune, Maharashtra were included in the study. Two hundred twenty-five children (83 females and 142 males) were participated in this study. There was no age difference between male (Mean=12.36 years, SD=1.51) and female (Mean=12.61 years, SD=1.63). The degree of intellectual disability of participants ranged from mild to severe based upon the IQ records available in school.

### 2.2 Materials

A non-stretching metric tape-measure was used to determine participants height. Height was measured in centimeters (cms) using a custom-made 3.5 metre wooden ruler and weight was measured in kilograms using a digital weighing scale which give a reading of weight in kilograms to one decimal place.

### 2.3 Procedure

The participants were recruited from Kamayani, Sai Sanskar & Sai Seva School for mentally challenged students situated in Pune, Maharashtra. The authorities of each school were contacted to seek the permission to conduct this survey further, consent from parents/guardians were obtained before start of this survey study. No parent or guardian expressly refused permission. Following receipt of this permission, the 225 potential parents were approached individually, the purpose of the study was explained to them and their children were invited to participate in the study. All 225 agreed and were then asked to sign a simplified informed consent form. All measurements, including height and weight, were taken at the school premises. During their measurement session, participants were dressed in their typical light clothing, such as t-shirt and slacks, wearing their socks but no shoes. Height was measured to the nearest millimeter, with participants aligned against a wall, looking straight ahead. A tester ensured that participants were standing in an upright position. Weight was entered to the nearest 100 grams as indicated on the scales. Body Mass Index was calculated using Quetelet's ratio. The formula is  $BMI = \text{kg}/\text{m}^2$  where kg is individual's weight in kilograms and  $\text{m}^2$  is their height in meters squared.

### 2.4 Ethical Consideration

Signed informed consent was obtained from the parent or guardian of the child at the time of registration, after they had read the proposal that involves noninvasive data collection methods and risks free intervention. All procedures were reviewed and accepted by the institutional ethical committee of S-VYASA University. Participation in this project was voluntary in nature and participants were not provided with any incentives for their participation.

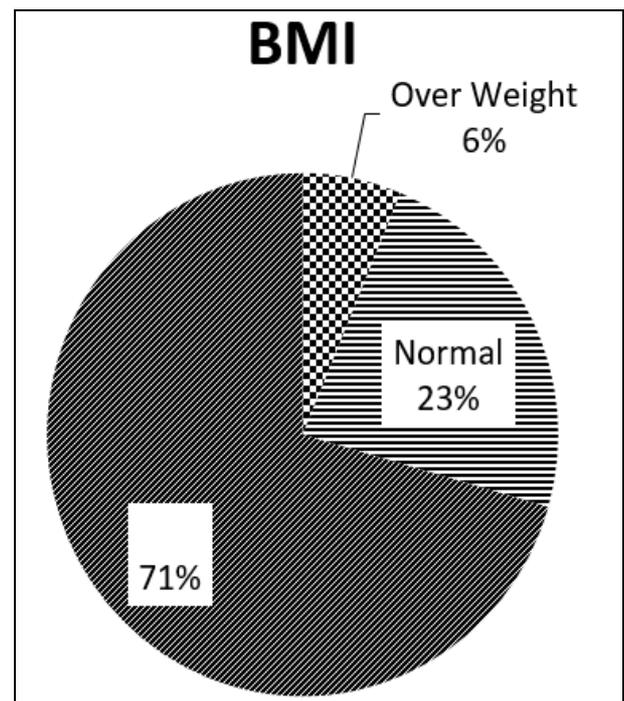
## 3. Results

Table 1 contains participants' average weight, height, and BMI by gender for the total sample. The total sample, as well

as male and female respondents, was classified into one of the three groups based on their BMI rating: that is, overweight, normal weight, and underweight. In the total sample, 6.2% of participants were overweight, 23.11% normal weight, and 70.22% were underweight. The results help to interpret that majority of children with ID were underweight.

**Table 1:** Weight, Height, Body Mass Index Means by Gender

	Weight (Kg)	Height (cms)	BMI (W/H <sup>2</sup> )
	Mean	Mean±SD	Mean±SD
Females	35.33±11.20	139.09±11.88	18.07±4.32
Males	33.85 ±11.54	139.93±14.16	16.99±4.32
Total	34.40±11.41	139.62 ±13.34	17.39±4.34
Weight classifications by using Body Mass Index			
	Overweight	Normal Weight	Underweight
Total (n=225)	6.25%	23.21%	70.53%



**Fig 1:** Body Mass Index

## 4. Discussion

The findings of present study indicate that majority of children aged 12-15 years with ID were underweight and only 6.2% children were overweight. The results of present study differ from earlier research reports wherein obesity was found to be prevalent in individuals with ID<sup>[17, 18, 19]</sup>. Most of earlier research studies were conducted on adults with ID and with specific disorder such as Down's syndrome<sup>[20, 21, 22, 23, 24]</sup>. This means that age and specific disorder may be considered as the contributing factor for obesity or overweight.

Nevertheless, results of present investigation are in consistent with earlier research studies. In one of the study it was seen that rates of underweight were higher for younger adults in low income countries of Asia-Pacific, and highest for males aged 11–13 from lower-middle income countries of Africa<sup>[25]</sup>. Thus, from the results it can be concluded that children below 15 years of age having ID seems to be underweight. The primary limitation of this study was selection of limited variables. In fact, future studies may consider body composition and anthropometric characteristics for the assessment of obesity among children with ID. Further, longitudinal studies are needed to establish findings of present study.

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