

Survey of Eating Disorder in Relation to Waist-to-Hip Ratio and Waist-to-Height Ratio among School Going Children

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Abstract: *The purpose of this study was to survey the eating disorder in relation to waist-to-hip ratio and waist-to-height ratio among school going children of Gwalior city. A total of hundred (N = 100) male subjects from Kendriya Vidyalayas of Gwalior city studying in classes from 10th to 12th standard with age ranged from 14 to 18 years were selected for this study. All the subjects were examined for eating disorder, waist-to-hip ratio and waist-to-height ratio. Results revealed that majority of subjects in eating attitude test fall under unlikely, waist hip ratio fall under the ideal-very low risk, while extremely slim category in waist-to-height ratio. Further, Pearson product moment correlation result revealed that eating disorder was significantly correlated with waist-to-hip ratio (0.261; $p < 0.05$) as well as waist-to-height ratio (0.242; $p < 0.05$). Therefore, it may be concluded that waist hip ratio and waist-to-height ratio can be used as a predictor for eating disorder. There are many plausible reasons behind the school going children are being suffering from eating disorder. Developing good practices early in life, will benefited in future.*

Keywords: Eating Disorder, Waist to Hip Ratio and Waist to Height Ratio

1. Introduction

In India the situation is quite alarming. The disease profile is changing rapidly. The World Health Organization (WHO) has identified India as one of the nations that is going to have most of the lifestyle disorders in the near future [1].

Eating may not appear to be a problem, however, irregular eating habits due to emotional status is quite worrisome and it is popularly known as eating disorder. It is a serious behavioral problem, rather an illness that affects your everyday diet, such as eating extremely small amounts of food or overeating. Factors responsible for such eating disorders are depression, anger, anxiety, low self-esteem, loneliness, personal relationships, emotional problems, cultural pressure, physical abuse etc. Common eating disorders include anorexia nervosa, bulimia nervosa, and binge-eating disorder [2].

Eating disorders should never be misunderstood to be purely nutritional problems, that is, problems that can be corrected by normalizing weight or food intake. They are psychological disorders [3]. Youngsters in the age group of 12-25 years are using diet pills, fat burners, fasting, resorting to self-induced vomiting etc. in order to stay slim and look attractive. They are deeply influenced by modern lifestyles together with ubiquitous show of a perfect 10 figure and airbrushed faces in advertisements & pictures of ramp models, film/sports personalities etc. in newspapers, magazines etc. says ASSOCHAM study. Kids as young as 12 years old are resorting to severe dieting, consuming fat burners and protein shakes thereby developing serious eating disorders, according to the Chamber study [4].

WHR is a slightly better predictor than waist circumference alone. This is probably because there is a positive association between waist and height in global populations of mixed ethnicity that include a wide range of heights [5]. Waist to height ratio is a better predictor of heart disease

and diabetes risk than BMI, according to new research presented at a scientific meeting recently. An advantage of WHtR is the simplicity of the health message "keep your waist circumference to less than half your height" [6]. The WHR has been used as an indicator or measure of the health of a person, and the risk of developing serious health conditions. Research shows that people with "apple-shaped" bodies (with more weight around the waist) face more health risks than those with "pear-shaped" bodies who carry more weight around the hips [7]. Hence, this study was undertaken to survey the eating disorder in relation to waist-to-hip ratio and waist to height ratio among school going children of Gwalior city.

2. Methods

A total of hundred (N = 100) male subjects from Kendriya Vidyalayas of Gwalior city studying in classes from 10th to 12th were selected and their age ranged from 14 to 18 years. Eating disorder, Waist to Hip Ratio and Waist to Height Ratio were the variables selected for this study. The subjects of these grades were educated enough to understand and provide relevant responses to the statements asked in the scales.

2.1 Administration of Test

2.1.1 Eating Disorder: EAT – 26 by M. Garner, 1982 [8] was adopted to find out the pattern of eating habits among school going children. Before the administration of the scale, all the subjects were explained about the purpose of the study and were ensured strict confidentiality, following which verbal informed consent was taken from each of them before the administration of scale. The subjects were given the option of not participating in the study if they did not want to. Scale was distributed personally by the researcher to all subjects and they were requested to fill the scales during school hours.

2.1.2 Height: Height of the subjects was measured through marked scale on the wall, which was having plane horizontal surface and was measured correct to the nearest 0.1 centimeter.

2.1.3 Waist and Hip Circumference: Waist Circumference measurement was taken at the level of narrowest point between the lower costal (rib) border and the iliac crest. If there was no obvious arrowing then the measurement was taken at the midpoint between these two landmarks. The measurer stood in front of the subject to correctly locate the narrowing of the waist. The measurement was taken at the end of the normal expiration with the arms relaxed at the sides and slightly abducted. Hip Circumference measurement was taken at the level of the greatest posterior protuberance of the buttocks which usually corresponds anteriorly to about the level of the symphysis pubis. The participant stood with feet together and was asked to tense the gluteal muscles. The measurer stood at the side of the subject to ensure that the tape was held in a horizontal plane when measuring this site [9].

The cross hand technique was used for measuring circumference and the reading was taken from the tape where, for easier viewing, the zero was located more lateral than the medial on the subject. The reading was taken to the nearest 0.1 centimeter.

3. Results

Table 1: Subject's Characteristics

	Mean	Std. Deviation
Age	14.87	0.98
Height	167.28	7.75
Weight	54.24	11.42
Waist to Hip Ratio	0.83	0.05
Waist to Height Ratio	0.41	0.04
Eating Disorder	13.57	6.78

Table 1 reveals the characteristics of the study subjects with the help of descriptive statistics are presented in Table 1. The mean and standard deviation for age, height and weight were 14.87 ± 0.98 , 167.28 ± 7.75 and 54.24 ± 11.42 respectively. In case of waist to hip ratio, waist to height ratio and eating disorder mean and standard deviation of subjects were 0.83 ± 0.05 , 0.41 ± 0.04 and 13.57 ± 6.78 .

Table 2: Total Percentage and Categories of Subjects in Eating Attitude Test

Category	Number of Subjects	Percentage
Unlikely	84	84%
Probable	6	6%
Likely	10	10%
Total	100	100%

Table 2 displays percentage of subjects, falling under different categories of EAT (Eating Attitude Test). EAT indicates whether an individual had a chance of suffering from eating disorders or not. Among subjects 84% (N=84) were unlikely suffering from eating disorders, 6% (N=6) subjects had probable chances of eating disorders and there were 10% (N=10) who fell under likely category.

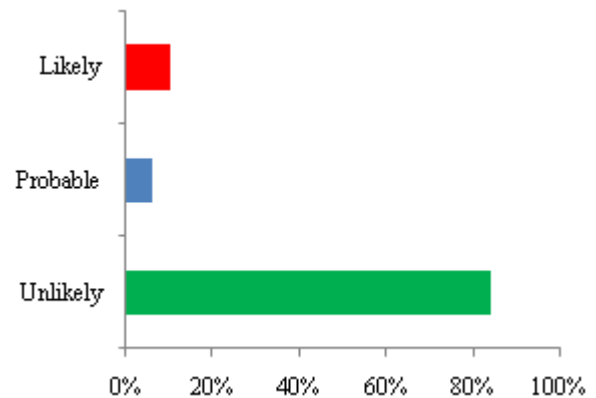


Figure 1: Total Percentage and Categories of Subjects in Eating Attitude Test

Table 3: Total Percentage and Categories of Subjects in Waist Hip Ratio

Category	Number of Subjects	Percentage
Ideal- Very Low Risk	90	90%
Low Risk	07	07%
Moderate Risk	03	03%
High Risk	00	00%
Total	100	100%

It is evident from table 3 that there were 90% (N=90) subjects who fell in ideal category of Waist to Hip Ratio, 7% (N=7) subjects fell under low risk category, Moderate and high risk categories were observed in 3% (N=3) and 00% (N=0) respectively among subjects.

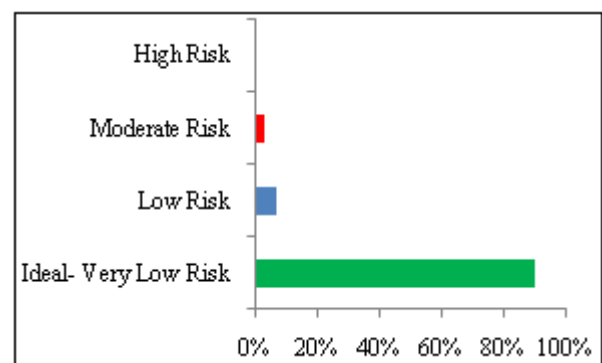


Figure 2: Total Percentage and Categories of Subjects in Waist Hip Ratio

Table 4: Total Percentage and Categories of Subjects in Waist to Height Ratio

Category	Number of Subjects	Percentage
Abnormally Slim to Underweight	00	00%
Extremely Slim	66	66%
Slender and Healthy	16	16%
Healthy, Normal, Attractive Weight	16	16%
Overweight	01	01%
Extremely Overweight/Obese	00	00%
Highly Obese	01	01%
Total	100	100%

Table 4 reveals the percentage of subjects, falling under different categories of Waist to Height Ratio. Among all the subjects, 66% (N=66) fell in extremely slim category of waist to height ratio, 16% (N=16) subjects fell under slender and healthy, 16% (N=16) also fell under Healthy, Normal, Attractive Weight, 1% (N= 1) in overweight and highly

obese category respectively and 0% (N=0) subjects who fell under Abnormally Slim to Underweight and Extremely Overweight/Obese respectively.

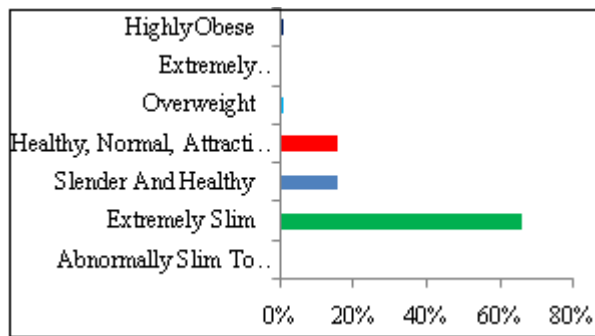


Figure 3: Total Percentage and Categories of Subjects in Waist Height Ratio

Table 5: Correlation between Eating Attitude, Nutritional Status, Waist to Hip Ratio and Waist to Height Ratio

	Waist to Hip Ratio	p-value	Waist to Height Ratio	p-value
Eating Disorders	.261*	.009	.242*	.015

* Significant at the 0.05 level; $r_{.05}(98) = .195$; $p < .05$

Table 5 depicts that there was a significant relationship between eating attitude and waist to hip ratio as well as waist to height ratio as p-value was less than .05.

4. Conclusion and Discussion

As in numerous other countries worldwide, the prevalence of overweight and obese youth is rising in India. These trends are concerning because obese children tend to become obese adults, and because childhood obesity is associated with a plethora of psychosocial disorders and cardiovascular disease risk factors. Childhood obesity has been called “one of the most serious public health challenges of the 21st century,” and with good reason [10].

Findings showed that there were large number of subjects’ unlikely suffering from eating disorders and 10% subjects had probable chances of eating disorders. These findings supported by the study done by Katherine Kam [11] which stated that eating disorders typically develop during adolescence or early adulthood.

Further, results revealed the significant relationship between eating disorders and waist to hip ratio at .05 level. The waist hip ratio is an indicator of disease related to obesity and useful in predicting adulthood diseases such as diabetes, cardiovascular disease, and liver disease [12]. In obesity eating habits of a person is also a contributing factor and if we are eating more and doing a lesser amount of exercises then our waist line may increase and one can suffer from diseases mentioned earlier. Chung, Song and Park [13] did a study on anthropometric indices and eating habits of female college students and they found a significant relationship between anthropometric indices and eating habits.

Significant relationship was also found between eating disorders and waist to height ratio at .05 level. These findings were also in a partial consonant of the study done

by wuet. al [14] who concluded that WHtR is a good anthropometric index which has a stronger correlation with the distribution of visceral and subcutaneous abdominal adipose tissue than BMI or WHR. Its association is closer to or stronger than WC.

In the past few decades there have been increases in the consumption of fast foods, pre-prepared meals, soft drinks, and candy. At the same time, physical activity patterns in youth have changed as a result of an increase in time spent watching television, the advent of video games and the internet, and a decrease in the opportunities for physical activity in schools and communities [15]. These are the plausible reasons behind the school going childrens’ being suffering from eating disorders. Developing good practices early in life, will benefited in future. Hence, parents, teachers and policymakers have to plan accordingly to make their child healthy and fit.

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