



## ASSOCIATIVE FACTORS OF OBESITY AMONG ADOLESCENTS IN SELECTED SCHOOLS OF PIMPRI CHINCHWAD MUNICIPAL CORPORATION OF PUNE CITY, MAHARASHTRA

\*SALVIRUPALI M<sup>1</sup>, CHANDEKARPRATIBHA A<sup>2</sup>

<sup>1</sup>Associate Professor Dr. D.Y. Patil College of Nursing, Pimpri, Pune, Maharashtra, India.

<sup>2</sup>Professor & Dean, Pravara College of Nursing, Loni, Ahmednagar, Maharashtra, India.

\*Corresponding author email: rumisa.kadam@rediffmail.com

Received: 06<sup>th</sup> Sept 2015, Accepted: 03<sup>rd</sup> Oct 2015.

### ABSTRACT

**Context:** WHO has declared obesity as one of the most neglected disease of significant public health importance of this century. WHO official website dedicated to 'Controlling the global obesity epidemic' states – 'At the other end of malnutrition scale, obesity is one of today's most obviously visible, yet most neglected public health problem. This study was conducted to assess associative factors of obesity among adolescents and its correlation with selected demographic variables. **Methods and Material:** A prospective cross sectional, descriptive study, conducted on 100 adolescents studying in affluent schools of PCMC were examined. Cross sectional research design, Probability sampling technique was used. Adolescents aged 13-16 years of age studying in affluent English medium schools located in Pimpri Chinchwad area were selected. **Results & Discussion:** The data showed that prevalence of obesity among adolescents was more while underweight was less as evidenced by BMI. Study results showed that prevalence of obesity increased as the increased BMI. More consistent waist height ratio was observed than waist hip ratio and it was also found 39% adolescents had central obesity. 24% of males and 8% of girls consumed less total calories per day than required while 50% of males and 10% of females consumed more than required total calories per day. **Conclusion:** Study revealed that High BMI, presence of abdominal fat and dietary pattern are important associative factors of obesity among adolescents.

**KEYWORDS:** Associative Factors, Obesity, Adolescents, Selected Schools.

### INTRODUCTION

Obesity is a global nutritional concern. Obesity is a form of development driven malnutrition that is emerging among all ages and socioeconomic groups<sup>[1,2]</sup>. Obesity is growing problem among children aged 3-12 years were overweight. This adverse trend has potentially profound effect on children health including their long term health.<sup>[3]</sup>

Not all obese infants become obese children and not all obese children become obese adults, however the prevalence of obesity increases with ages among health both male and female.

<sup>[4]</sup>There is a greater likelihood that obesity even in early childhood ill persist through life span.<sup>[5]</sup> The prevalence of obesity seems to be increasing in most part of the world, even where it used to be rare. Studies from Indian schools showed

prevalence of 7.5% -10% Overweight children tend to remain overweight during follow up period of 20 years. They have increased risk for overweight as adults and obesity related complications such as hypertension, diabetes and coronary artery disease.<sup>[2]</sup> The prevalence of obesity is high in developing countries and similar trend being observed in recent years among children from developing countries. School based data on obesity in India showed prevalence of 5.6% to 24% among children and 7.4% prevalence of obesity in affluent schools in children in Delhi. Whereas Khadilkar reported prevalence of obesity to be 5.7% and overweight 19.9% among affluent school boys in Pune.<sup>[6]</sup>

Obesity is increasing problem in the world. Prevalence is increasing on day to day basis. Infant obesity leads to adult obesity. Obesity presents multiple problems to the child in addition to the risk of obesity in adulthood. Adult obesity is the leading cause of pediatric hypertension associated with type 2 diabetes mellitus, increasing the risk of coronary artery diseases, increasing stress on weight bearing joints, lowers self-esteem and effect on psychological problem are most significant consequences of obesity in children.<sup>[2]</sup> Eating out has become a trend these days; youngsters prefer to go out with their friends for meals, though families also go out together. In a study conducted by Baudier 52% children ate meals outside home, boys more frequently than girls 60% and 43% respectively which had significant correlation with obesity.<sup>[7]</sup>

Young is the mantra of New Delhi initiative target adolescents that aim to raise awareness and check the rapidly increasing causes of obesity and diabetes among them in the country.<sup>[8]</sup> Thirty schools in three cities – Delhi, Jaipur and Agra participated in major intervention programme by the ‘Diabetes Foundation of India’, taught students about healthy dietary and lifestyle practices to prevent diseases such as diabetes, obesity and heart diseases. Under this programme over 50,000 school children would be educated over a period of 3 years to understand the benefits of eating nutritious food for healthy life. The number of obese children has increased drastically from 60% in 2004 and 28% in 2006.<sup>[9]</sup>

In a study on obesity and overweight children, there were 44 boys and 63 girls in the study. 15 children were overweight having a BMI >85<sup>th</sup> percentile (14%), 79 were normal having BMI between 15-85 percentile (12.1%) Mean values of total lipids, cholesterol, triglycerides and insulin were higher in overweight children as compared to normal weight children. High levels of TLC and LDL-C were defined as > 130 mg/dl respectively. TG level 130mg/dl was considered high and an HDL-C level < 35 mg/dl was considered low. Overweight children had more adverse lipid profile and insulin levels compared to normal children.<sup>[10]</sup>

In conjunction with obesity epidemic in adults, we are starting to see an increase of obesity in children. Obesity has been

identified as risk factor for poor outcome in adult trauma patients.<sup>[11]</sup> Data from CDC indicate there are significantly increase in number of young children under the age of 5 years and across all ethnic groups who are overweight. Increasing number of children have BMI at or above 95<sup>th</sup> percentile, with 15.3% of children 6-11 years having BMI ≥ 95<sup>th</sup> percentile and therefore consider overweight according to guidelines. The world overweight/obesity epidemic in children is a global epidemic.<sup>[12]</sup>

The presence of overweight/obesity in childhood is related to multiple health problems starting in childhood.<sup>[13]</sup> The circulatory system is affected by childhood overweight/obesity resulting in health problems related to hypertension, hyperlipidemia and dyslipidemia, pulmonary alterations, such as sleep apnea. Recently orthopaedic change has been reported in children who are overweight/obese with problems like sleep-related apnea.<sup>[14]</sup>

Low self-esteem has been reported to influence depression, social interactions and relationships, performance in school and work and ability to lose weight.<sup>[15]</sup>

It was found that overweight/obese children with decreasing level of self-esteem were more likely to exhibit greater rates of nervousness, sadness and loneliness.<sup>[16]</sup> One concern is that children who are overweight/obese could be further at risk for decreased self-esteem if, after participating in the weight management program Cameron suggested that overweight/obese children are usually unable to meet their weight loss goals and become embarrassed and feel inadequate as weight increases. Weight programs may be perceived as punitive and not helpful by children. Weight loss program should not single out overweight/obese children but focus on healthy lifestyle with increased activity and optimal nutrition for all children.<sup>[15]</sup>

Soft drink consumption has been increased by 30% in the past 20 years, and 56-85% of children in school consume at least one soft drink daily. The odds ratio of becoming obese among children increases 1.6 times for each additional can or glass of sugar sweetened drink consumed beyond their daily intake of

beverage. Soft drinks currently constitute the leading source of added sugars in the diet. Sweet Soft Beverages are classified as high glycemic index liquids; increases post prandial blood sugar levels and decreases insulin sensitivity.

## MATERIALS AND METHODS

**Study design:** A prospective cross sectional, descriptive study.

**Ethics approval:** Official permission was taken from the Principal of each school. Consent was taken from the class teacher; consent from parents was obtained. The adolescents were explained the purpose of study, confidentiality of their response was assured.

**Sample size:** Study was conducted on 100 adolescents studying in affluent schools of PCMC were examined. Cross sectional research design, Probability sampling technique was used.

**Inclusion criteria:** Adolescents aged 13-16 years of age studying in affluent English medium schools located in Pimpri Chinchwad area were selected.

**Exclusion criteria:** Those adolescents who refused to participate in the study. Adolescents above 16 years of age were excluded.

## Methodology

The history suggestive of associative factors was elicited. All adolescents were subjected to anthropometric \*measurement to elicit prevalence of obesity, which included BMI, waist hip ratio, waist height ratio, neck circumference, %body fat, and lean body mass. (Height was measured in erect position without shoes 0.5 cm was rounded off to the next number. Weight was taken in erect position ensuring zero calibration. Waist (boys) was measured horizontally, at the level of the navel while for (girls) was measured horizontally, at the level of minimal abdominal width. Neck was measured below the larynx with the tape sloping slightly downward to the front. Hips were measured as the largest horizontal circumference around the hips. BMI was calculated and correlated with the Standard BMI Chart. There are total 2 body mass index charts; one for boys and other one for girls which is given by WHO in 2008 for Asian adolescents. Waist to hip ratio, waist to height ratio, lean body mass, percentage body fat was then calculated to know about abdominal obesity and over all obesity. In anthropometric measurements Waist to hip ratio, waist to height ratio, lean body mass, percentage body fat was added along with

BMI calculation to know about abdominal obesity and over all obesity.

## STATISTICAL ANALYSIS

Observations were statistically analyzed by differential and inferential statistics.

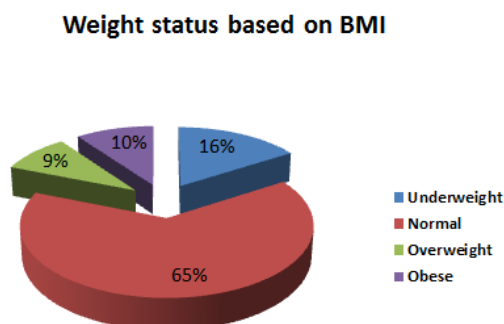
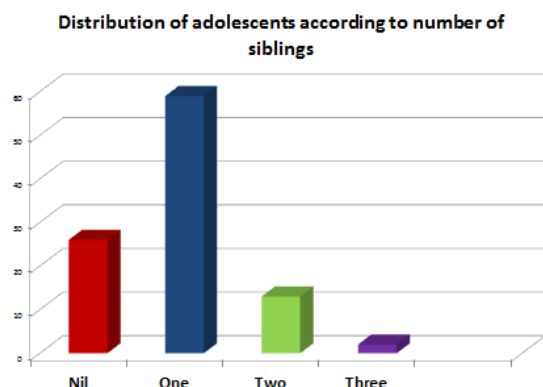
## RESULTS

The data showed that prevalence of obesity among adolescents was 19% while underweight was 16% as evidenced by BMI. The waist height ratio was more consistent than waist hip ratio and 39% adolescents had central obesity. 24% of males and 8% of girls consumed less total calories per day than required while 50% of males and 10% of females consumed more than required total calories per day, which could be cause of existence of both obesity and underweight at the same time. Correlation between waist height ratio and waist hip ratio by Karl Pearson coefficient correlation is 0.64 which shows consistent amount of association between these two parameters as adolescence is a growing stage and obesity is widely prevalent amongst adolescent children of affluent schools of urban areas of PCMC, Pune. 3% of obese girls had hirshutism while 9% of obese boys had gynaecomastia and 30% of obese adolescents had neck hyperpigmentation which are classical clinical features of obesity. 6% of obese adolescents were born prematurely while 55% were ignorant of adverse effects of obesity on health and 8% were non-vegetarians.

Table 1. Description of Samples (Adolescents) According To Demographic / Personal Characteristics

Parameter		N
Gender	Male	31
	Female	69
Food habit	Vegetarian	32
	Non vegetarian	68
Birth type	Full term	94
	Premature	6
Family type	Nuclear	78
	Joint	22
Hyper pigmentation on neck	Absent	
	Present	
Gynaecomastia in male	Absent	
	Present	

History of birth type was elucidated from parents of adolescents. Members in nuclear family were parents and children. However members in joint family comprised of parents children and grandparents. Several studies on obesity found that hyperpigmentation on neck (posterior aspect) was present among obese or overweight adolescents (Table 1).



## DISCUSSION

The present study findings have implications for nursing practice, nursing education, nursing administration and nursing research and similar results were also observed in findings of Sukhpal Kaur et al (2007)<sup>[17]</sup> and Tetyana L Vasylyeva et al (2013).<sup>[18]</sup>

An active search for obesity among healthy adolescent is fundamental aspect of management. It is the responsibility and the right of an individual to attain a positive state of health. A large number of diseases could be prevented with little or no

medical intervention if people were adequately informed about the likely complications and encouraged to take the necessary precautions in time.

Assessment of obesity is an issue about which there has been a growing concern throughout the community, hospital, schools and child care centers etc. The primary prevention consists of two major types of activities technological and cognitive. Cognitive activities encompass health education, which is an important nursing responsibility. Nurses working in various settings like hospitals, community health centers, schools, colleges etc. should make use of the opportunity for providing the correct information regarding obesity. The nurses working in hospital, (Pediatric department), and community centers both in inpatient and outpatient services play an important role in education about the associative factors and assessment of obesity and early detection of future complications. The nurses can conduct various camps and formulate various health educations programme in various settings. The nurse can teach every person to recognize the pre-indicators for obesity and to be aware. The nurse can teach the school teachers and parents to assess the obesity of their students & children and make them sure that they are really away from obesity and will have a healthy life in future. It can be possible through various A. V. Aids such as Poster and charts can be displayed and pamphlets distributed in the OPDs of the Hospitals and Public places, Schools. Child health nurses, Community health nurses and child care centers can participate in the assessment of community needs and assessment of obesity their associative factors in children.

**CHILD HEALTH NURSING PRACTICES:** In child health nursing practices it helps to diagnose the Obesity in children in hospitals and community. Mass and individual health education, identification of source of obesity, meet the main need of community, participation and consultation in obesity and related problems in children. Most important it helps the health team to provide accessible, available and affordable services to the obesity in adolescent children and who are at risk in the community.

The child health Nurse needs to be equipped with advanced knowledge and skill to become involved in providing the

necessary services to children, parents, teachers, community people and various education programmes in order to motivate and encourage them to self-assessment of obesity for the early detection of future problems. Also the pediatric nurse can educate the community people about diet therapy, medications, and behavioural therapy. Nurses through their own training acquire a positive attitude and should equip themselves with a sound base of knowledge, which they can use in clinical practice.

### **NURSING EDUCATION**

With changing health care trends nursing education must emphasize primary health care approach focusing on prevention than cure and promotion of health.

The education curriculum must include imparting knowledge about the use of various teaching strategies and principles for effective planned health education.

Now days much importance is given to awareness and promotion of health than the curative aspects. As the needs of society are continuously changing newer components must be incorporated in the nursing curriculum. Nursing education must emphasize on primary prevention and rehabilitative aspects. The basic training of nurses in India includes teaching of certain units related to care of children with obesity should update as a part of the course in child health nursing, and pediatric. Theoretically the focus should be on the assessment of obesity and their associative factors.

The nursing teachers can use the result of the research study as an informative illustration for the students. Nursing education should help in inculcating values and a sense of responsibility in the students to educate the teachers about assessment of obesity, risk factors and associative factors and how to manage the obesity condition.

However speciality oriented courses are offered at the master level. Training programmes for nurses however, need to be improved, to meet the new demands of assessment of obesity and their associative factors and treatment as nurses are expected to encounter increasing incidence of obese children in their families as part of their professional practice.

### **NURSING ADMINISTRATION**

In the event of ever changing disease manifestations, knowledge explosion, technological and ever-growing challenges of child health nursing. The administrator has a responsibility to provide nurses with substantial continuing educational opportunities. This will enable the nurses in updating their knowledge, acquiring special skills and demonstrating high quality care by deputing them for in- service education programs, special courses, workshops and conferences can be arranged and attended by nursing staff not only in the Hospital but also in the community area. Necessary administrative support should be provided for the development of such educational materials. Nursing personnel should be motivated to devote their time for development of educational material such as posters, pamphlets, and planned health teaching and booklets on assessment and management of children with obesity.

There is a genuine need for continuing education for nurses, particularly for those who are working in hospital (pediatric departments) and working in community centers dealing with various diseases with obesity in children.

As a part of administration, the nurse administrator plays a vital role in educating parents, community health nurses, community health workers and student nurses.

The findings of the study should be used as a basis of in-service education programs for nurses so as to make them aware of the present problems in the community.

### **NURSING RESEARCH**

Nursing research is an essential aspect of nursing as it uplifts the profession and develops new nursing norms and a body of knowledge. Another research has been added to the Nursing literature. Very few studies have been done on a similar basis. The research design, findings and the tool can be used as avenues for further research.

There is a need for extensive and intensive nursing research in this area so that strategies for educating people on the assessment and management of obesity in adolescent children. The nurse researcher should be able to conduct the research on various aspects of awareness about prevention of obesity, so as

to generate more scientific data. Findings of this will provide baseline data about obesity in adolescent children, and strategies that can be adopted to educate people about prevention, assessment of obesity and it can be used for further research.

## CONCLUSION

This study showed that prevalence of obesity increased as the BMI increased. Study revealed that High BMI, presence of abdominal fat and dietary pattern are important associative factors of obesity among adolescents.

## CONFLICT OF INTEREST

Nil

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