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Research Article

PREVALENCE OF OBESITY AS A RISK FACTOR FOR NON COMMUNICABLE DISEASES AMONG ADULTS IN URBAN FIELD PRACTICE AREA NMC, RAICHUR

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ABSTRACT

Background: Obesity is a most prevalent malnutrition all over the world. It is characterized by abnormal growth of adipose tissue. Indeed, we are amidst an epidemic of obesity. [(1)(2)(3)] Obesity is arbitrarily considered to be present when the fat content of the body is greater than 25% of the body mass in men and 30% in women. Overweight is equally arbitrarily chosen as greater than 130% relative weight, according to life insurance build and mortality tables, or on a body mass index (kg/m^2) greater than 26. [(4)] Over the past two decades there has been a dramatic rise in the prevalence of obesity throughout the world. It is estimated by the WHO that globally, over 1 billion (16%) adults are overweight and 300 million of these (5%) are obese. [(3)] **Objectives of the study:** 1. To estimate the prevalence of obesity among urban population. **Methods: Study Design:** A Cross sectional, Community based study was undertaken over a period of one year from January 2013 – December 2013, in Urban field Practice area of Navodaya Medical College. **Study Population:** People aged 18-65 years residing in the urban field practice area of NMC. **Sampling method**: Systematic random sampling. **Statistical Analysis:** Chi Square Test by using SPSS version 17. **Results:** Total participants in the study were 1751, comprised of 964 males and 787 females. In our study 23.7% of the participants were pre obese (24.79% of males and 22.49% of females). 3.82% of the participants were obese. 35.46% participants had abnormal WHR, it is alarming to note high prevalence 72.68% in females when compared to 5.08% in males. **Conclusion:** Over weight / obesity and abdominal obesity are seen in nearly one fourth and more than one third of the urban population respectively. It is alarming to note that over weight / obesity and abdominal type of obesity are more among females compared to males.

INTRODUCTION

One of the commonest expressions of unhealthy diet, often combined with lack of physical activity, is obesity. Obesity is a most prevalent malnutrition all over the world. It is characterized by abnormal growth of adipose tissue. Indeed, we are amidst an epidemic of obesity. [(1)(2)(3)] Obesity is arbitrarily considered to be present when the fat content of the body is greater than 25% of the body mass in men and 30% in women. Overweight is equally arbitrarily chosen as greater than 130% relative weight, according to life insurance build and mortality tables, or on a body mass index (kg/m^2) greater than 26. [(4)] Over the past two decades there has been a dramatic rise in the prevalence of obesity throughout the world. It is estimated by the WHO that globally, over 1 billion (16%) adults are overweight and 300 million of these (5%) are obese. [(3)] The highest rise in the number of obese is noted in the countries with fast growing economies especially of South East Asia. As many as 250 million people in the third world countries suffer from obesity. In India prevalence of Obesity is 12.6% in women and 9.3% in men. In other words, more than a 100 million individuals are obese in India. We are truly in the midst of an obesity epidemic, which has serious health ramifications. [(2)]

Hazards of Obesity: [(2)]

Obesity is associated with a higher risk of mortality and morbidity. The life expectancy of a morbidly obese individual is about a decade lower than one with normal BMI. Most overweight and obese individuals exhibit certain diseases in which more common are Metabolic & Degenerative like, Diabetes type 2 (50 to 100 times more common in obese), hyperlipidemia, ischemic heart disease, hypertension (5 to 6 times commoner), stroke (2.5 to 6 times commoner), gall stones, breast and colon cancer, infertility (men and women), gout and polycystic ovary syndrome.

Causes of Obesity: [(2)]

Obesity results from an excess of dietary energy intake as compared to energy expenditure and thus both an increase in

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intake and a decrease in energy expenditure will lead to excess calories being stored as fat and, ultimately to obesity.

Increased energy intake: An increased energy intake due to lifestyle changes and affluence as seen in urban areas seems to be fuelling the obesity epidemic.

Passive Overeating: The term passive overeating is applied to the practice of eating without a biological need, and not expanding the calories thus gained. Such a situation is commonly seen in the urban setting today where one relishes French fries, wafers and other high calorie snacks while watching TV or using a computer.

Binge eating: It is the practice of overindulging in eating in a short time. This might occur in a party, on a weekend or with drinks. In the binge eating occasions become rather frequent; it certainly is a cause of obesity.

Decreased energy expenditure: There is a rapid decline in energy expenditure i,e. in manul labor resulting from vehicle ownership, availability of labor- saving devices, shunning outdoor sports and watching television and computer use for long hours. These factors contribute to obesity.

Metabolic Factors: In some individuals endocrine disorders such as Cushing's syndrome and hypothyroidism, Prader-Willi Syndrome etc, are the cause of obesity.

Genetic factors: Obesity tends to run in families. Obesogenic genes are under study, which alter the metabolism or alter the response to obesity limiting hormones like Leptins etc.

Fetal programming: The Barker's hypothesis proposes that under nutrition during pregnancy may increase the susceptibility of that individual to obesity in adulthood.

Types of Obesity: [1]

Gynoid / 'Pear Shaped': The fat is evenly distributed (globally distributed).

Android/ 'Apple shaped': In this type of obesity, the fat is centrally distributed or deposited preferentially in the abdominal region. This expresses the peritoneal (visceral) distribution of fat in the individual. This type of obesity is commonly seen in men of the South East Asian Region, including India. Such a distribution is higher risk factor for coronary artery disease as compared to the global distribution of fat in the body. Higher waist circumference or higher WHR is a good indicator of visceral (peritoneal) deposition of fat.

Objectives

To estimate the prevalence of obesity among urban population.

METHODOLOGY

Study Area

The study was undertaken in the urban field practice area of the Department of Community Medicine, Navodaya Medical College, Ashapur, Raichur

Study Population

The study population comprised of people aged 18-65 years residing in the urban field practice area of Navodaya Medical College & Hospital, Raichur.

Study Design

Community based cross sectional study.

Statistical Analysis

The data was entered in excel spread sheet after coding. It will be processed and analyzed statistically using the SPSS statistical package (SPSS version 17.0 for windows 2009).Chi Square test was used and P value less than 0.05 will be considered significant.

Duration of study

January 2013 – December 2013.

Inclusion Criteria

People aged 18-65 years who are the permanent residents in the urban field practice area of Navodaya medical College.

Exclusion criteria

1. Individuals below 18 years and above 65 years
2. Individuals who did not give consent

Sample Size calculation

Using statistical formula

$$n = \frac{z^2 pq}{d^2}$$

Prevalence of NCD in urban area, p= 5%

n = 1900 (150 among these were not responding, so the sample size came to be 1751)

Sampling method

Systematic random sampling. House was taken as the sampling unit.

Measurement of Obesity[1]: It was calculated from Body Mass Index (BMI)

BMI= Weight in kilograms/ Height in metre squares

Table 1 Classification of adults according to BMI

Body Mass Index	Classification
<18.50	Underweight
18.5-24.99	Normal
>/=25	Overweight
25.00-29.99	Preobese
30.00-34.99	Class 1 Obesity
35.00-39.99	Class 2 Obesity
>/=40.00	Class 3 Obesity

Central Obesity [5]

Central obesity is diagnosed when waist-hip ratio is > 0.9 in males and >0.8 in females.

RESULTS

24.27% participants were over weight in the study, among them 56.5% were males and 43.5% were females. 4.2% were obese with BMI of > 30, among them 60% were males and 40% were females.

Table 2 Socio Demographic Factors

CATEGORY		NUMBER	PERCENTAGE
Gender	**Male**	**964**	**55.1**
	Female	787	44.9
Marital status	Married	1380	78.8
	Never Married	184	10.5
	Widow	187	10.7
Occoputaion	Unemployed	6	.3
	Labourer	160	9.1
	Semi-skilled worker	898	51.3
	Clerical/Shop owner/farmer	258	14.7
	Semi-Profession	249	14.2
	Profession	180	10.3
Literacy	Illiterate	460	26.3
	Literate	1291	73.7
Religion	Hindu	1157	66.1
	Muslim	361	20.6
	Christian	206	11.8
Socio economic status (Modified B G Prasad)	Class V	39	2.2
	Class IV	503	28.7
	Class III	696	39.7
	Class II	412	23.5
	Class I	101	5.8

Table 3 Association between Nutritional status and Gender

		Gender		Total (%)
		Male (%)	Female (%)	
Nutritional Status (BMI)	Underweight(%)	156 (50.16)	155 (49.83)	311 (17.76)
	Normal (%)	523 (55.63)	417 (44.4)	940 (53.68)
	Overweight (%)	240 (56.5)	185 (43.5)	425 (24.27)
	Obese (%)	45 (60.0)	30 (40.0)	75 (4.28)
Total %		964 (100)	787 (100)	1751 (100.0)

X^2= 4.225, df=3, p=0.238

Table 4 Association between Body Mass Index and Age category

Body Mass Index	Age Category (years)					Total (%)
	<20 (%)	21-30 (%)	31-40 (%)	41-50 (%)	>51 (%)	
<18.5	42 (13.5)	99 (31.8)	80 (25.7)	46(14.8)	44 (14.1)	311 (100)
18.5- 24.99	146 (15.3)	329 (34.4)	226 (23.6)	128(13.4)	128 (13.4)	957 (100)
25-30	56 (13.5)	136 (32.7)	99 (23.8)	53(12.7)	72 (17.3)	416 (100)
>30	6 (9.0)	21 (31.3)	18 (26.9)	14 (20.9)	8 (11.9)	67 (100)
Total	250 (14.3)	585 (33.4)	423 (24.2)	241(13.8)	252 (14.4)	1751 (100)

X^2=10.176, df= 12, p= 0.6

54.6% of participants were in the normal range of BMI. 23.7% were in between 25- 30 BMI among them 32.7% were in the age group 21-30 years, followed by 23.8% in 31-40 age group. 3.8% belonged to BMI >30, among them 26.9% belonged to 31-40 years age group.

Table 5 Association between Waist to Hip Ratio and Gender

WHR	Gender		Total (%)
	Male (%)	Female (%)	
Normal*	915 (94.91)	215 (27.31)	1130 (64.5)
Abnormal**	49 (5.08)	572 (72.68)	621 (35.46)
Total	964 (100)	787 (100)	1751 (100)

X^2 = 865.041, df= 1, p<0.0001,

*normal in Male<1.0 and in females < 0.85, **Abnormal in Male >1.0 and in Females >0.85. 35.46% participants had abnormal WHR, 72.68% of females and 5.08% of males were having abnormal WHR. The test applied was statistically significant.

Table 6 Association between Waist Hip Ratio and Age category

	Age Category (years)					Total (%)
	<20 (%)	21-30 (%)	31-40 (%)	41-50 (%)	>51 (%)	
Normal*	138 (12.2)	360 (31.9)	293 (25.9)	148 (13.1)	191 (16.9)	1130 (100)
Abnormal**	112 (18.0)	225 (36.2)	130 (20.9)	93 (15.0)	61 (9.8)	621 (100)
Total	250 (14.3)	585 (33.4)	423 (24.2)	241 (13.8)	252 (14.4)	1751 (100)

X^2= 30.937, df= 4, p= 0.0001;

35.4% of participants were having abnormal WHR, among them 36.2% belonged to 21-30 years age group followed by 20.9% in 31-40 age group. The test was statistically significant.

Table 7 Association between Nutritional Status and Physical Activity

		Physical activity			Total (%)
		Sedentary (%)	Moderate (%)	Severe (%)	
Nutritional Status (BMI)	Underweight (%)	57 (16.66)	202(19.31)	52(14.32)	311(17.76)
	Normal (%)	174 (50.87)	552 (52.77)	214(58.95)	940 (53.68)
	Overweight (%)	99 (28.94)	246 (23.51)	80 (22.03)	425 (24.27)
	Obese (%)	12 (3.5)	46 (4.39)	17 (4.68)	75 (4.28)
Total		342 (19.5)	1046 (59.7)	363 (20.7)	175 (100.0)

X^2= 11.318, df=6, p=0.079

19.5% of the participants were sedentary. Among them 28.94% were overweight and 3.5% were obese. The test was not statistically significant.

24.27% were overweight in this study among them, 39.7% of the participants belonged to Class III Socio Economic Status, amomg them 39.3% were overweight, followed by 30.7% were obese. The test was not statistically significant.

DISCUSSION

This survey aimed to evaluate pre obese and obesity among adults. The risk factors are the diseases of tomorrow. Identifying these risk factors in populations occupies a central role in the surveillance system because of the importance of lag time between exposure and the disease. Therefore, public health strategies have to be driven by the motive of identifying risk factors in populations, and countries need to know the profile of risk factors of populations in different settings.

Obesity is an important in the pathogenesis of Hypertension, dyslipidemias, diabetes mellitus, which together with hyperinsulinemia, make up the 'deadly quartlet' for the metabolic syndrome.

- 24.27% participants were over weight in the study, among them 56.5% were males and 43.5% were females. 4.2% were obese with BMI of > 30, among them 60% were males and 40% were females. Similar trend was seen in other studies by Mohan V et al, study conducted in Jaipur and Thankappan KR et al. [6][7]
- 54.6% of participants were in the normal range of BMI. 23.7% were in between 25- 30 BMI among them 32.7% were in the age group 21-30 years, followed by 23.8% in 31-40 age group. 3.8% belonged to BMI >30, among them 26.9% belonged to 31-40 years age group.

Table 8 Association between Nutritional status and Socio Economic Status

		BG Prasad SES					Total (%)
		ClassV (%)	Class IV (%)	Class III (%)	Class II (%)	Class I (%)	
Nutritional Status (BMI)	Underweight(%)	8 (2.6)	97 (31.2)	118(37.9)	75(24.1)	13(4.2)	311(100)
	Normal (%)	16(1.7)	266(28.3)	388(41.3)	213(22.7)	57(6.1)	940(100)
	Overweight (%)	13(3.1)	117(27.5)	167(39.3)	100(23.5)	28(6.6)	425(100)
	Obese (%)	2 (2.7)	23 (30.7)	23 (30.7)	24(32.0)	3(4.0)	75(100)
Total (%)		39(2.2)	503(28.7)	696(39.7)	412(23.5)	101(5.8)	1751(100)

X^2= 11.167, df=12, p=0.515

- 35.46% participants had abnormal WHR, 72.68% of females and 5.08% of males were having abnormal WHR.
- 35.4% of participants were having abnormal WHR, among them 36.2% belonged to 21-30 years age group followed by 20.9% in 31-40 age group. Similar trend was seen in other studies by Mohan V et al, study conducted in Jaipur and Thankappan KR et al. [(6)(7)]
- 19.5% of the participants were sedentary. Among them 28.94% were over weight and 3.5% were obese.
- 24.27% were over weight in this study among them, 39.7% of the participants belonged to Class III Socio Economic Status, amomg them 39.3% were over weight, followed by 30.7% were obese.

CONCLUSION

Over weight / obesity and abdominal obesity are seen in nearly one fourth and more than one third of the urban population respectively. It is alarming to note that over weight / obesity and abdominal type of obesity are more among females compared to males.

Recommendations

- Strengthening the evidence for NCD prevention and control by assessing its burden and risk factors through NCD risk factors surveillance.
- Integration of all NCDs related national programme by creating separate division/department for NCDs and renaming the programme as integrated National NCDs Control Programme keeping the scope open for entry of more diseases in future.
- Routine screening for risk factors and NCDs in the health services for all individuals.
- Emphasis on comprehensive approach that encompasses preventive, promotive, curative and rehabilitative aspects in medical and nursing curriculum rather emphasizing only on curative care.

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