Int J Biol Med Res.2021 ;12(1):7208-7212

Contents lists available at BioMedSciDirect Publications

International Journal of Biological & Medical Research

Journal homepage: www.biomedscidirect.com

Original article

Associated Risk Factors in patients attending obesity clinic at Medical Health Camp

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ARTICLE INFO

Keywords:
Risk Factor
Overweight
Obesity
BMI
WHR

ABSTRACT

Background: Overweight and obesity are the accumulation of high body adiposity, which can have detrimental health effects and contribute to the development of numerous preventable non-communicable diseases. This study is based on the whether socio-demographic factors and associated risk factors like life style modification can play a potential role in the increase in adiposity pattern among adult individuals. Materials and Methods: A retrospective record based observational study was conducted to address the study objective. To study the socio-demographic factors among patients attending Obesity Clinic and to estimate risk factors among patients attending Obesity Clinic. All consecutive patients attending Obesity Clinic at medical health camp was considered eligible for participation Results: Total 102 patients attended the obesity clinic out of which 47(46.1%) were male while 55 (53.9%) patients were female Mean age of participants was 34.64 with standard deviation 12.03. It has been found that 9(8.82%) patients had normal BMI, 36(35.29%) were comes under overweight category and remaining 57(55.88%) majority of participants were obese with BMI more than 30.Conclusion: The major conclusion drawn from this study is that risk factors like sedentary life style, consuming junk foods, outside food, ≥ 3 meals per day and non veg diet are associated with higher prevalence of overweight and obesity.

Introduction

Obesity is one of the most widespread and major problems affecting children as well as adults and is a global nutritional concern. An increased prevalence is found in many countries where the major nutritional disorder previously was under nutrition. Obesity may be defined as an abnormal growth of the adipose tissue due to enlargement of fat cell size (hypertrophic obesity) or an increase in fat cell number (hyperplastic obesity) or a combination of both. Obesity is often expressed in terms of body mass index (BMI) .Overweight is usually due to obesity but can arise from other causes such as abnormal muscle development or fluid retention.

There are more than 1 billion overweight people (BMI ≥25) in the world. Of those, approximately 350 million are obese (BMI ≥30.0). Overall, about 2.5 million deaths are attributed to overweight/obesity worldwide. Earlier overweight and obesity were universally accepted as a problem of the rich countries, but the scenario has changed in the present generation, as we can see a significant problem of overweight and obesity even in middle and low-income countries. The epidemiological transition has shown the shift of diseases from communicable to non-communicable disease, such as cardiovascular disease, hypertension, diabetes and cancer. Noncommunicable diseases (NCDs) are the prominent health problems of both the developed and the developing countries, which includes the middle and lower income countries. Overweight and obesity have always been one of the major factors influencing such health problems.

The World Health Organization (WHO) has reported that individuals from both developed and developing countries consume more quantities of high energy food and exhibit less physical activity. These lead to an increase in the prevalence of overweight and obese individuals to epidemic proportions. Several demographic, biological, socio-economic and lifestyle factors have been shown to exhibit strong effects on excess adiposity. It has been opined that for an effective management of the obesity epidemic is the need to understand the socio-cultural, economic, educational and environmental factors involved in the excess adiposity (overweight and obesity). Several studies have subsequently focused on the role of such influencing factors on overweight and obesity among adult populations. The determination of these potential risk factors that appear to have effects on excess adiposity may be very constructive to design intervention and prevention strategies and very challenging task to researchers focusing on population investigations. Moreover, it is a rather difficult proposition to identify the determinant factors (risk factors) of higher adiposity among different populations. it is

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critical to determine the relative importance of specific obesity-related risk factors. Patterns of physical activity as well as sedentary living appear to play an important role in long-term weight regulation.

This study is based on the whether socio-demographic factors and associated risk factors like life style modification can play a potential role in the increase in adiposity pattern among adult individuals. This study further tries to evaluate the effects of certain socio- demographic and lifestyle-related factors that have potential associations with the prevalence of overweight and obesity, and use of these finding to develop effective strategies for prevention of obesity in the community. among patients attending Obesity Clinic

MATERIALS AND METHODS

Study Setting and Study Design: The study was conducted in a tertiary care hospital, Shri Vasantrao Naik Government Medical College, Yavatmal, Maharashtra, India.A Retrospective study was conducted to address the study objective. All consecutive patients attending Obesity Clinic at medical health camp was considered eligible for participation in the study

Study procedure: A present study was conducted at tertiary care teaching hospital in Yavatmal, Maharashtra, India. A Medical Health Camp was held at Shegao, Buldhana district, maharashtra on dated 23/12/2018. In a pre-structured proforma, data regarding age, sex, religion, education, occupation, socio-economic class and risk factors like endocrine factors, meals per day, eating junk food, eating out side food, alcohol consumption, exercise, inactivity etc ask similarly their present health problem due to obesity recorded in case record form.

The dietary history was assessed by asking the participants about main servings, number of junk food consumption at home/outside, and consumption of juices and carbonated drinks. The physical activity was assessed by asking frequency of exercise (walking briskly, swimming, running, jogging, race walking, and aerobics), outdoor games, and mode of transport, and sedentary lifestyles was assessed by asking duration of watching television, computers, and day time sleep. All anthropometric measurements were taken by trained investigators.

Ethical approval was obtained from our Institutional Ethical Committee (IEC). Study was not started before written approval from IEC and informed consent was obtained from all subjects. Total confidentiality of data will be maintained by PI.

Anthropometric measurements

Weight: Weight was measured using a Analog Weighing Scale, which was calibrated on a daily basis with known weights. To ensure consistency, only one scale was used in each of the above areas.

Height: Height was measured using a stadiometer. Height was measured without any footwear. The participants stood straight with heels, buttocks, back touching the vertical limb of the instruments, and stretching upwards to the fullest extent with arms hanging on the side. The head was aligned so that the lower rim of the orbit and the auditory canal were in the horizontal plane (Frankfurt plane). Mild upward pressure was exerted on the mastoid region bilaterally.

Waist and hip circumferences: Waist and hip circumferences were measured in the following manner. The subject was asked to stand with his/her arms by their sides and to breathe normally. The following points were marked on the right side:

The subcostal margin in the mid-axillary line; and

The highest point of the iliac crest in the mid-axillaryline.

The centre of these two points was marked. At this point the waist circumference was measured with a fiberglass tape after applying a tension of 600 g (this was carried out with the help of a spring balance). The measurement was rounded up to the nearest mm. Adequate care was taken to ensure that the subject was breathing normally at the time of taking the measurement. Hip circumference was measured at the level of the greater trochanters with the subject standing and breathing normally. The measurement was made to the nearest mm using the same fiberglass measure and applying a tension of 600 g.

Definitions

Body mass index : Body mass index (BMI) was calculated by dividing the weight of an individual in kg by the square of his/her height measured in meters.

Normal weight: 18.50 - 24.99 kg/m2.

Overweight: BMI of 25 - 29.99 kg/m2.

Obese: BMI of ≥ 30 kg/m2

Waist : hip ratio : Waist :hip ratio (WHR) is a ratio of waist and hip circumferences.

Central obesity or Abdominal Obesity

Central obesity was defined as a WHR of >1 in males and >0.85 in females.

Statistical analysis: Collected data was analyzed in computer by using the Statistical Package for Social Sciences (SPSS) program version 16. Data analysis was analyse by using descriptive and inferential statistical methods: frequency, percentage, means, standard deviation (S.D.). A chi-square test used for qualitative data, p-value less than 0.05 considered to be statistically significant.

RESULTS:

Table No. 1 Distribution of patients according to socio-demographic factors.

Socio-demographic factors		Frequency	Percent
Gender	**Male**	47	46.08%
	Female	55	53.92%
Age Group	**<14**	8	7.84%
	14-19	7	6.86%
	21-30	18	17.65%
	31-40	39	38.24%
	41-50	23	22.55%
	51-60	5	4.90%
	≥61	2	1.96%
Religion	**Hindu**	98	96.08%
	Muslim	4	3.92%
Occupation	**Housewife**	40	39.22%
	Farmer	18	17.65%
	Student	16	15.69%
	Clerical	12	11.76%
	Teacher	9	8.82%
	Labourer	7	6.86%

Education	**Professional of Honour**	9	8.82%
	Graduate	7	6.86%
	Intermediate Or Diploma	30	29.41%
	High School Certificate	31	30.39%
	Middle School Certificate	18	17.65%
	Primary School Certificate	4	3.92%
	Illiterate	3	2.94%
Socio-Economic Class	**Upper Middle**	14	13.73%
	Lower Middle	54	52.94%
	Upper Lower	34	33.33%
Total		**102**	**100%**

Medical health camp conducted at shegao where total 102 patients were attended the obesity clinic from 10 am to 5pm,in our study 47(46.1%) were male while 55 (53.9%) patients were female. Most of the participants 62(60.7%)are between the age group of 31 to 50, 8 (7.8%) participants were children (age less than 14 years) and only 2(1.96%) are having age more than 60 years. Mean age of participants was 34.64 with standard deviation 12.03, ranges from 10-62 years. 98 (96.1%) attending obesity clinic belongs to Hindu community whereas only 4(3.9%)were from Muslim community.

Results also demonstrate, 40(39.2%) women who were attended a clinic stays at home called housewife, other occupation involved in are farming 18(17.6%), clerical 12(11.8%), teaching 9(8.8%) and labour work 7(6.9%) respectively and 16(15.7%) participants were still studying.61 (59.8%) were either diploma holder, graduated or professional,49(48%) participants were studied up to secondary education and 3(2.94%) were not gone to school at all. Most of the participants are belongs to Lower Middle socio-economic class 54(52.9%) and very less 14(13.7%) belong to Upper Middle socio-economic class according to modified kuppuswamy scale updated for year 2018.

Table No. 2 Distribution of patients according to Body Mass Index(BMI) and Waist Hip Ratio (WHR).

Anthropological parameters of study subjects		Frequency	Percentage
BMI	**Normal** (18.50-24.99)	9	8.82%
	Overweight (25.00-29.99)	36	35.29%
	Obese(≥30)	57	55.88%
WAISTHIP RATIO(Male >1, Female >0.85)	**Abnormal**	60	58.82%
	Normal	42	41.18%
TOTAL		102	100%

Results shows that 9(8.82%) patients had normal BMI, 36(35.29%) were comes under overweight category and remaining 57(55.88%) majority of participants were obese with BMI more than 30.

After taking waist and hip circumference, we calculate the waist hip ratio and it was observed that,60(58.82%) study subjects had abnormal waist hip ratio and 42 (41.18%) had normal waist hip ratio as per the gender cut off.

Table No. 3 association between risk factors and nutritional status of patients according to Body Mass Index (BMI).

Risk Factors				Nutritional Status of Patients According to Body Mass Index (BMI)						
				Normal	Overweight	Obese	Total	Chi-Square Value	df	p-value
1	Co morbidities	Yes	Frequency	1	18	33	52	6.829	2	0.0329
			Percent	11.11%	50.00%	57.89%	50.98%			
		No	Frequency	8	18	24	50			
			Percent	88.89%	50.00%	42.11%	49.02%			
2	Family history of obesity	Yes	Frequency	1	9	17	27	1.46	2	0.482
			Percent	11.10%	25.00%	29.80%	26.50%			
		No	Frequency	8	27	40	75			
			Percent	88.90%	75.00%	70.20%	73.50%			
3	Exercise regularly	Yes	Frequency	6	16	14	36	8.074	2	0.0177
			Percent	66.67%	44.44%	24.56%	63.16%			
		No	Frequency	3	20	43	66			
			Percent	33.33%	55.56%	75.44%	64.71%			
4	Diet	Mix	Frequency	3	20	41	64	6.184	2	0.0454
			Percent	33.33%	55.56%	71.93%	62.75%			
		Veg	Frequency	6	16	16	38			
			Percent	66.67%	44.44%	28.07%	37.25%			
5	Outside meal	Yes	Frequency	2	13	33	47	6.647	2	0.036
			Percent	22.22%	36.11%	57.89%	46.08%			
		No	Frequency	7	23	24	55			
			Percent	77.78%	63.89%	42.11%	53.92%			
6	Junk food	Yes	Frequency	2	15	37	54	8.525	2	0.0141
			Percent	22.22%	41.67%	64.91%	52.94%			
		No	Frequency	7	21	20	48			
			Percent	77.78%	58.33%	35.09%	47.06%			
7	Meals per day	≥3	Frequency	4	20	47	71	10.5	2	0.0052
			Percent	44.44%	55.56%	82.46%	69.61%			
		≤2	Frequency	5	16	10	31			
			Percent	55.56%	44.44%	17.54%	30.39%			
8	Green leafy vegetables per week	≥4	Frequency	6	20	22	48	4.071	2	0.1306
			Percent	66.67%	55.56%	38.60%	47.06%			
		≤3	Frequency	3	16	35	54			
			Percent	33.33%	44.44%	61.40%	52.94%			
9	Alcohol	Yes	Frequency	2	14	27	43	2.259	2	0.3232
			Percent	22.22%	38.89%	47.37%	42.16%			
		No	Frequency	7	22	30	59			
			Percent	77.78%	61.11%	52.63%	57.84%			
Total			Frequency	9	36	57	102			
			Percent	100.00%	100.00%	100.00%	100.00%			

Another promising finding of study was, out of 57 obese and 36 overweight participants 33(57.89%) and 18(50%) respectively had at least one of the co-morbidity like Diabetes mellitus, Hypertension or Hypothyroidism, and was found statistically significant (p-value = 0.0329). 36 study subjects exercise regularly according to their sex and age while 66 had sedentary life style with p-value = 0.0177.

A statistically significant association between type of diet with BMI was found, participants with mix diet had higher chances of obesity with p-value = 0.0454. A positive statistical relation of outside eaters, junk food eaters and ≥ 3 meals per day between BMI category was reported, obese participants are more outside eaters, junk food eaters and ≥ 3 meals per day than overweight and normalpeoples with p-value equals to 0.036, 0.0141 and 0.0052 respectively. Whereas no significant association between family history of obesity, eating ≥ 4 green leafy vegetables per weeks and alcohol consumption of participants and BMI category.

DISSCUSSION

In our study the female participants 55(53.92%) are more as compare to male 47(46.08%)participants and maximum participants 62 are from age group 30 to 50 years the findings are coincide with overseas study done by Helen B. Hubert a labour camp survey in united states and by Ahmed F study in Kuwait. Similarly Indian studies by Goyal JP Kaur Jaspinder and Dr. Tage T . 96.08% participants belongs to majority of Hindu community and more than half 88 (86.27%)are from lower middle / upper lower socio economic class community and these findings are similar with a study by Vohra R , Prasad Rajiv

In this study most of the participants educated up to HSC and intermediate, as the maximum participants are females, so the 40 (39.22%) women's are playing the role of housewife, the study by Kaur Jaspinder at Punjab the findings on education were contrary to our study where most of the study subjects were either illiterate or educated up to primary, whereas most of the study subjects 43 (67.78%) stays at home in this study.

In our study, from the short review above, key findings emerge that out of 102 participants 57(55.88%) were obese BMI (≥ 30) and 36 (35.295) were overweight, the results are substantially higher than other study because participants are visiting to obesity clinic voluntarily during medical health camp. Study in California among 186 labour camp participants 36(19.35%) were obese and 74(39.78%) were overweight and Indian studies first by Kaur J in Punjab 64(18.23%)study subjects were obese and 117(33.33%) were overweight and second by Dr. Tage T in Mumbai in which 26.9% respondents were obese whereas 32.5 respondents were overweight, in these studies percentage of overweight's are more than obese participants as compare to present study.

Our results demonstrated that 60(58.82%) participants had as abnormal WHR and this findings are comparable with study in Mumbai and Pune– , were most of the respondents had central obesity with abnormal WHR.

Many epidemiologic studies have shown that body Mass Index (BMI) which is a measure of obesity, is a powerful predictor of co morbidities like DM, HTN etc. In our study 33 (57.89%) obese and 18 (50%) overweight participants having history of at list one Co-morbidity, study conducted by Gothankar J S ,Yichun Chao and Kaur Jaspinder having similar results of co-morbidities association with BMI. in our study it was found that family history of obesity present in 17(29.18%) obese participants out of 57 obese participants, which was not statistically significant, the findings are contrary to a study by Prasad Rajiv in which 50(24.05%) are obese with family history of obesity($p<0.001$). In the study conducted by Marwah reported that parental obesity may increase the risk of obesity through genetic mechanism or by shared family characteristics inthe environments such as food preference. In present study it was found that 66 (64.71%) obese participants associated with not doing daily exercise with p-value= 0.0177 similar observation seen in Prasad Rajiv ($p<0.001$), Goyal JP ($p =0.018$). Study conducted by Paul J vengelers and S Kumar reported significant relation between lack of daily exercise and occurrence of obesity.

In the present study we found that 37 (64.91%) obese are eating junk food and ≥ 3 time meals per day with outside food, similar pattern of results was obtained by Tarek taukif– . Study conducted by Paul J vengelers and Goyal reported that junk food consumption is most influencing risk factor for obesity. Study conducted by Agrawal T reported that youngster prefer to go, college canteen, outside street food with their friends for meals, sometimes with the family. Majority of obese participants 41(71.93%) was taking mixed diet, 47(82.46%) had ≥ 3 frequency of meal per day consumption and also would like to eat food outside the home and prefer junk food over regular meals which is statistically significant BMI of participant which was similar to Study conducted by Prasad Rajiv &Jain G they reported that diet pattern (mixed, vegetarian), meals per day, eating outside home and prefer junk food over regular meals and had special role in obesity. Consumption of green leafy vegetables ≥ 4 per week does not have any statistical association (p-value = 0.1306) with BMI of participants and this is consistent with what has been found in previous study at Kuwait by Ahmed F (p-value = 0.102).

The current study found a no association between obesity and alcohol consumption, where various epidemiologic data showed that a positive, negative, or no relationship between alcohol intake and BMI was influenced by body weight, diet, genetic factors, gender and physical activity, study finding coincide with study at Punjab by Kaur Jaspinder .

Conclusion: The major conclusion drawn from this study is that risk factors like sedentary life style, consuming junk foods, outside food, ≥ 3 meals per day and non-veg diet are associated with higher prevalence of overweight and obesity. Thus, involving in house hold activities and doing regular physical exercise could help in lowering the prevalence of overweight and obesity in community.

However, almost all the risk factors were potentially modifiable and preventable, which requires better understanding of the causes to overcome the barriers for the primary prevention of obesity among youth and adults to achieve a healthy life style and to ensure the positive health.

Limitation of the study: Optimal cut-offs for BMI and WHR can only be devised on the basis of international classification by WHO, but cut-offs of the Asian Indian population is different. As the design of our study was cross-sectional in a medical health camp, the results need to be confirmed in a larger population based study.

DECLARATIONS

Funding & Expenses: No Funding

Conflict Of Interest: No Conflict of Interest

Ethical approval: The study was approved by the Institutional Ethics Committee

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