

RESEARCH ARTICLE

PHARMACY PRACTICE

EFFECTIVENESS OF PATIENT COUNSELING ON WEIGHT REDUCTION IN RURAL AND URBAN OVERWEIGHT AND OBESE PATIENTS

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ABSTRACT

Obesity and overweight have been reported as a risk factor for diseases such as diabetes, hypertension etc. To make people aware of this fact counseling may play an important role hence; a randomised prospective study was carried out to evaluate the effectiveness of patient counselling in overweight and obese patients on weight reduction in a rural and urban sector of Tamil Nadu, India. A total of 200 subjects were recruited and counseling was provided on diet, physical activity and behavioural modifications. Statistical analysis of data collected revealed that mean levels of body mass index before and after intervention in urban and rural population after three months projected a 't' value of 11.69 and 11.06, respectively which was found to be statistically significant at $P=0.001$. It was concluded from the study that counseling provided to the patient helped in decreasing total body weight, waist circumference and risk of weight related complications.



KEY WORDS

Overweight, obese, diet, physical activity, counseling, body mass index.

INTRODUCTION

All over the world, obesity has almost reached epidemic proportions and India is not far behind¹. Once considered a problem only in high income countries, overweight and obesity are now dramatically on the rise in low and middle income countries, particularly in urban settings².

Obesity was identified as a nutritional disorder thirty years ago and still continues to be one of the most important, yet preventable health hazards. Obesity has reached epidemic proportions globally, with more than 1 billion adults overweight, at least 300 million of them clinically obese and is a major contributor to the global burden of chronic disease and disability. Often coexisting in developing countries with under-nutrition, obesity is a complex condition, with serious social and psychological dimensions, affecting virtually all ages and socioeconomic groups².

Obesity and overweight pose a major risk for serious diet-related chronic diseases, including type 2 diabetes, cardiovascular disease, hypertension and stroke and certain forms of cancer³⁻⁶. The health consequences range from increased risk of premature death to serious chronic conditions that reduce the overall quality of life⁷. The key causes are increased consumption of energy-dense foods high in saturated fats and sugars and reduced physical activity⁸⁻⁹. As populations become more urbanized, and as lifestyles shift towards reduced physical activity and increased food consumption, the prevalence of obesity is expected to rise¹⁰. Moderate weight loss of 10kg may lead to the following health improvements like > 20% fall in mortality, > 30% fall in diabetes related deaths, > 40% fall in obesity related cancer deaths, fall of 10 mmHg in both systolic and diastolic blood pressure, fall of 50% in fasting glucose, fall of 10% in total cholesterol, fall of 15% in low density lipoprotein, fall of 30% in triglycerides and increase of 8% in high density lipoprotein cholesterol¹¹.

The World Health Organisation's (WHO) projections indicated that, in 2005, approximately 1.6 billion adults (age 15+) were overweight and at least 400 million adults were obese. At least 20 million children under the age of 5 years were overweight. WHO further projects that by 2015, approximately 2.3 billion adults will be overweight and more than 700 million will be obese². Prevalence of overweight in India is expected to increase in both men and women over the next decade and is projected that by 2015, 31% male and 21% female population will be overweight¹². Hence the study was designed to provide effective counselling to overweight and obese patients on weight reduction and to evaluate the effectiveness of patient counselling on weight reduction in overweight and obese patients in a rural and urban sector of Tamil Nadu, India.

MATERIALS AND METHOD

Study design:

Free obesity awareness camps were set up in T.Nagar, Chennai (urban) and Odhiyathur, Villupuram district (rural) to conduct the randomised prospective study. Pamphlets were distributed to the public to make them aware of the camp. Visitors were asked to fill the patient proforma provided to them and the principle investigator filled the answers for the people who were not able to read and write by interviewing in person. The proforma described their socio-demographic data and other necessary details. The visitors were then screened on site for the study and 100 subjects who appeared to meet the eligibility requirements were measured for their height (cms), weight (kgs) and waist circumference (cms). A digital scale BEURER was used to measure subject's weight in kilograms to the accuracy of 100gm. Height was measured barefoot and waist

circumference (WC) was ascertained by tape measure. Waist circumference was assessed in the standing position, midway between the highest point of the iliac crest and the lowest point of the costal margin in the mid-axillary line. Overall adiposity was assessed by Body Mass Index (BMI). The BMI was calculated as weight in kilograms divided by height in meters squared.

Consent was procured from the subjects and counseling was provided on diet, physical activity and behavioural modifications. Booklets "Lifestyle Modifications" and "South Indian Food Items and their Calories" were provided which contain guidelines for selection of food items (low calorie, low fat alternatives, and food exchange list), guidelines for physical activity and behaviour change, both in English and Tamil. Motivation to lose weight was also rendered by playing videos regarding obesity and its complications like diabetes, hypertension etc. Subjects were advised not to take more than three meals per day and 1-2 snacks per day. Also, they were asked to take the normal food as prepared for the rest of the family members and were informed to avoid high caloric food items. Regarding exercise, the subjects were asked to walk briskly at least 30 minutes a day. Subjects were also recommended to consult a dietician and fitness instructor for effective weight reduction. They were asked to follow this for three months and their diet and exercise patterns were reviewed at least once in a month. The weight, BMI and WC were measured again during their monthly visit. Based on the outcome of weight reduction, further counselling was provided. The prevalence of overweight and obese patients, male or female, who had lost weight from both the rural and urban areas, was reported.

Study site:

Rural – Odhiyathur, Villupuram district, Tamil Nadu.
Urban – T.Nagar, Chennai, Tamil Nadu.

Study period:

The study was conducted for eight months, from July 2010 to February 2011.

Inclusion criteria:

- Male and female patients in the age group of 18 to 60 years.
- Patients with Body Mass Index 25 to 40.
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Exclusion criteria:

- Psychiatric patients
- Pregnant or nursing mothers
- Patients with cardiac problems
- Self report of HIV positive and active tuberculosis
- Patients having history of binge eating
- Patients with recent fractures
- Patients with respiratory diseases
- Patients on prolonged use of corticosteroids and drugs that have an adverse effect of weight gain.
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Data collection:

The data were collected by interviewing the subjects in person. Demographic details and other information related to patient complaints, past medical and medication history etc. were also collected by using specially designed patient proforma.

RESULT

The prevalence of overweight patients in Asian south Indian population was 74% (n=100) and 57% (n=100) in urban and rural sector, respectively whereas 26% (n=100) and 6% (n=100) patients in urban and rural population, respectively were obese. The percentage of overweight patients was 79.01% (n=81) and 52.63% (n=19) in urban men and women, respectively compared to 95.66% (n=46) and 76.47% (n=17) in rural men and women, respectively before counselling. After counselling, 68% and 57.9% urban men and women, respectively were found to be overweight compared to 73.91% and 47.06% rural men and women respectively. The percentage of obese patients was 21.03% (n=81) and 46.86% (n=19) in urban men and women, respectively compared to 4.34% (n=46) and 23.53% (n=17) in rural men and women, respectively before counselling. After counselling, 18.51%

and 31.6% urban men and women, respectively were found to be obese compared to 4.35% and 23.53% rural men and women, respectively. After three months of intervention, 13.58% (n=81) and 10.52%

(n=19) urban men and women, respectively compared to 21.74% (n=46) and 29.41% (n=17) rural men and women, respectively achieved normal standards of weight (Table 1).

Table 1
Percentage distribution of overweight and obesity patients before and after 3 months of intervention

Category	URBAN								RURAL							
	Before counselling				After counselling				Before counselling				After counselling			
	Male		Female		Male		Female		Male		Female		Male		Female	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Over weight	64	79.0	10	52.63	55	68	11	57.90	44	95.6	13	76.47	34	73.9	8	47.0
Obese I	15	18.5	6	31.6	14	17.28	3	15.80	1	2.17	3	17.65	2	4.35	3	17.6
Obese II	2	2.51	3	15.8	1	1.23	3	15.80	1	2.17	1	5.88	0	0	1	5.88
Normal	0	0	0	0	11	13.58	2	10.52	0	0	0	0	10	21.7	5	29.4

Fig 1
Graph represents the data from Table 1 (Urban)

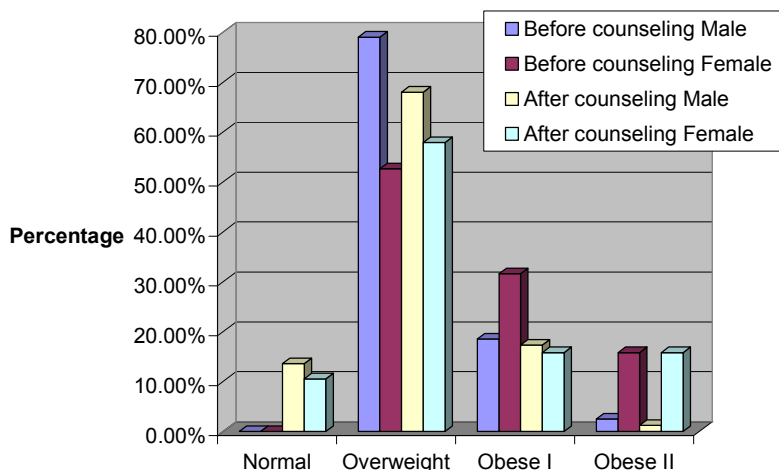
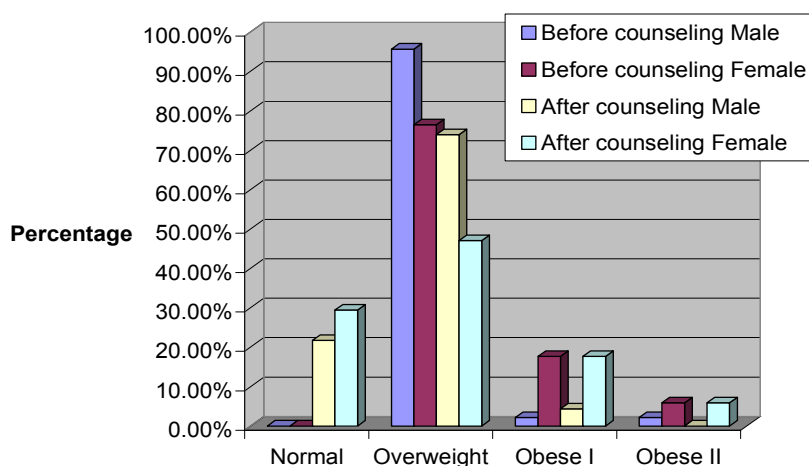


Fig 2
Graph represents the data from Table 1 (Rural)



The mean levels of weight, BMI and WC of urban men and women were significantly higher than those of their rural counterparts. After three months of intervention, the BMI and WC levels were found to be reduced to a greater extent in urban males and rural females compared to their counterparts. The mean weight, BMI and WC in urban and rural population before and after counselling is indicated in Table 2.

Table 2

Mean levels of weight, BMI, WC before and after 3 months of counselling in both urban and rural area

Parameter	URBAN				RURAL			
	Before counselling		After counselling		Before counselling		After counselling	
	Male	Female	Male	Female	Male	Female	Male	Female
Mean weight (kg)	81.52	72.21	78.38	70.64	72.53	64.26	70.02	61.58
Mean BMI (kg/m²)	28.09	29.26	26.96	28.63	27.11	28.18	26.24	26.71
Mean WC (cms)	97.83	92.56	95.56	91.50	91.77	94.29	90.88	93.22



Fig 3
Graph represents the data from Table 2 (Mean weight)

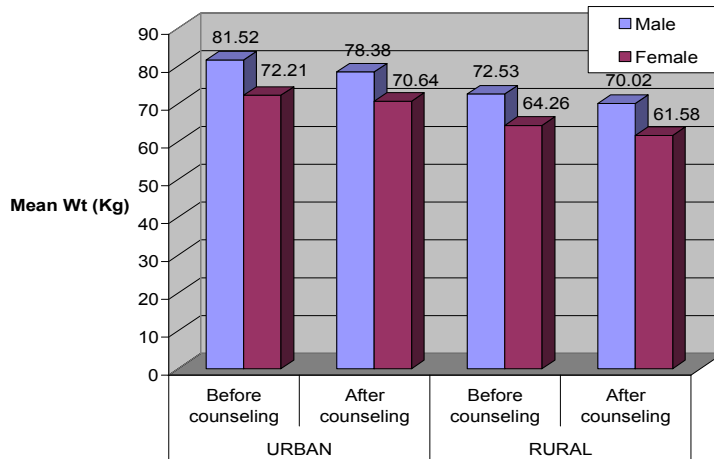


Fig 4
Graph represents the data from Table 2 (BMI)

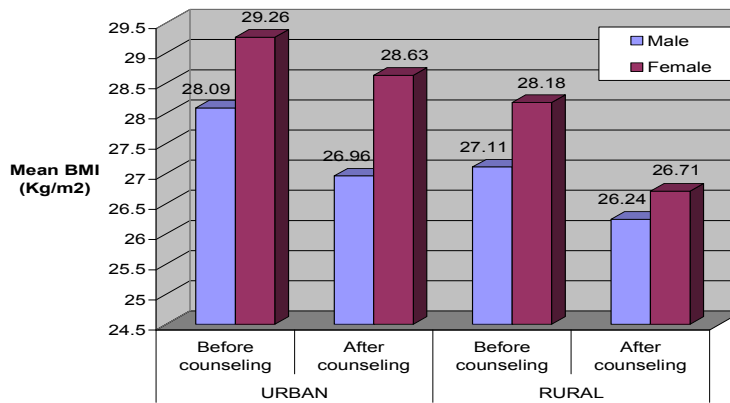
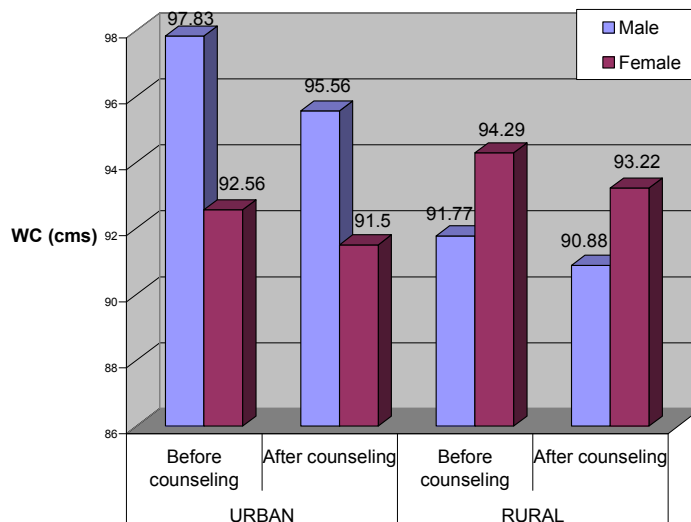


Fig 5
Graph represents the data from Table 2 (WC)



In accordance with paired t-test, the analysis revealed that comparison of before and after intervention mean levels of BMI in urban and rural population after three months projected a 't' value of 11.69 and 11.06, respectively which was found to be statistically significant at P=0.001. Mean levels of WC in urban and rural population after intervention projected a 't' value of 12.70 and 5.22, respectively which was statistically significant at P=0.001.

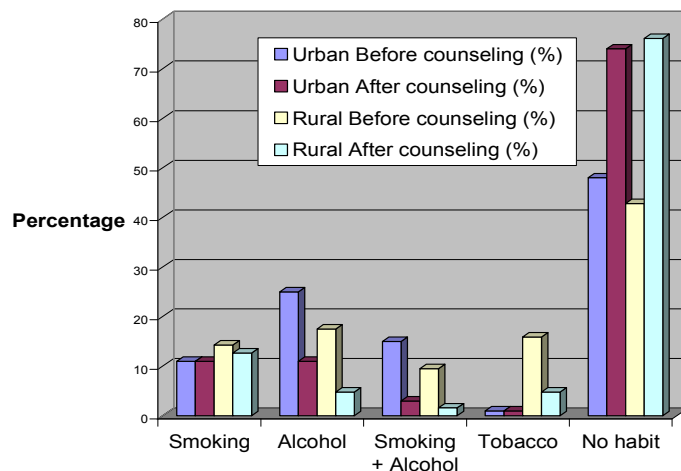
The prevalence of smokers was found to be similar in both urban (32.12%) and rural (32.6%) male population which after counseling depreciated to 17.3% in urban male population and 19.56% in rural male population. Percentage of alcoholics was 49.37% and 36.9% in urban and rural male

population, respectively which after counselling declined to 17.3% and 8.69% in urban and rural male population respectively. Prevalence of women smokers and alcoholics was not reported in both urban and rural population. In general, the percentage of tobacco chewers was more in rural population compared to urban. After counselling, the percentage of tobacco chewers in rural male population decreased from 15.2% to 4.35% whereas the percentage remained the same in urban male population (1.23%). Female tobacco chewers were found to be absent in urban population compared to 17.65% in rural population which after counseling declined to 5.88% (Table 3).

Table 3
Percentage distribution of social habits before and after intervention

Social habit	URBAN		RURAL	
	Before counseling (%)	After counseling (%)	Before counseling (%)	After counseling (%)
Smoking	11	11	14.3	12.7
Alcohol	25	11	17.5	4.8
Smoking + Alcohol	15	3	9.5	1.6
Tobacco	1	1	15.9	4.8
No habit	48	74	42.8	76.1

Fig 6
Graph represents the data from Table 3

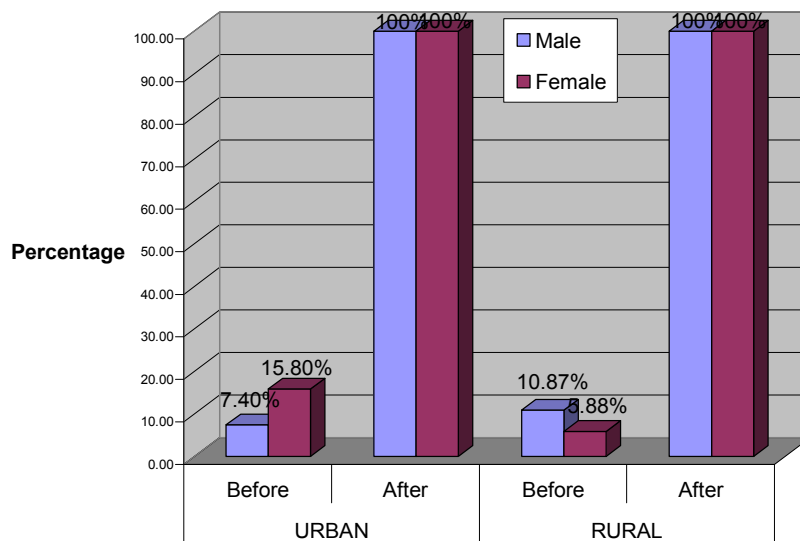


Awareness of obesity and its complications was found to be greater in urban population (23.2%) than rural population (16.75%) before counseling (Table 4).

Table 4.
Awareness of Overweight and Obesity before and after intervention in both urban and rural area in percentage

Awareness	URBAN								RURAL							
	Before counseling				After counseling				Before counseling				After counseling			
	Male		Female		Male		Female		Male		Female		Male		Female	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Yes	6	7.40	3	15.80	81	100	19	100	5	10.87	1	5.88	46	100	17	100
No	75	92.60	16	84.21	0	0	0	0	41	89.13	16	94.12	0	0	0	0

Fig 7
Graph represents the data from Table 4

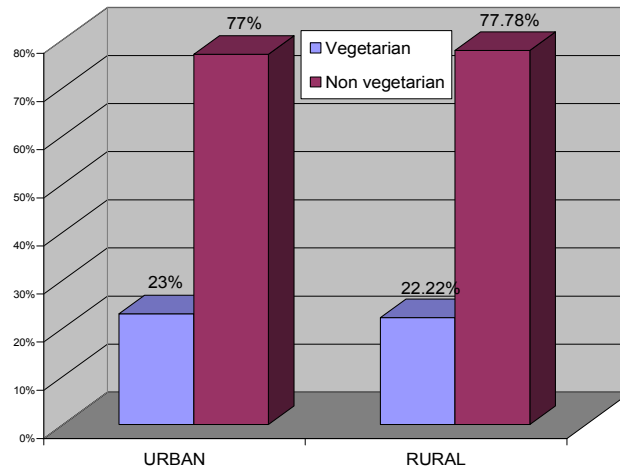


Based on dietary habits, non-vegetarians were found to be more obese and overweight than the vegetarians in both rural (77.7%) and urban (77.7%) population (Table 5).

Table 5
Percentage distribution of diet habit:

Diet habit	URBAN	RURAL
Veg	23%	22.22%
Non veg	77%	77.78%

Fig 8
Graph represents the data from Table 5

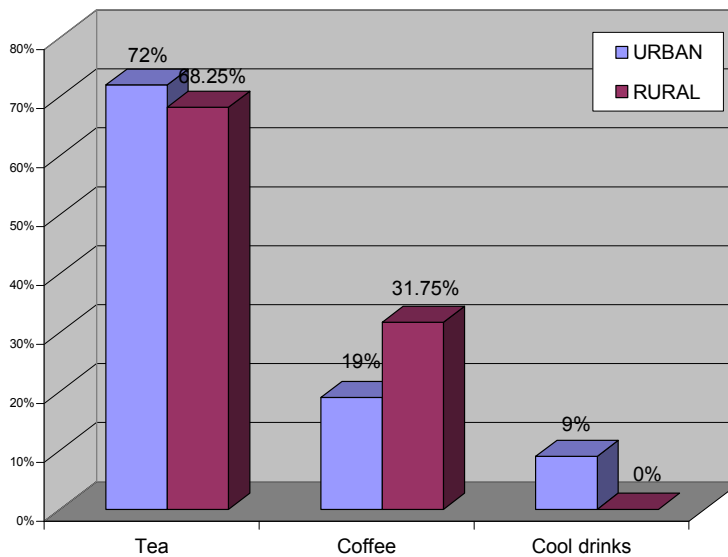


Majority of the urban (72%) and rural (60.25%) population were found to be tea consumers. Urban population were more likely to consume carbonated drinks (Table 6).

Table 6
Percentage distribution of beverage habit

Beverage habit	URBAN	RURAL
Tea	72%	68.25%
Coffee	19%	31.75
Cool drinks	9%	0%

Fig 9
Graph represents the data of Table 9

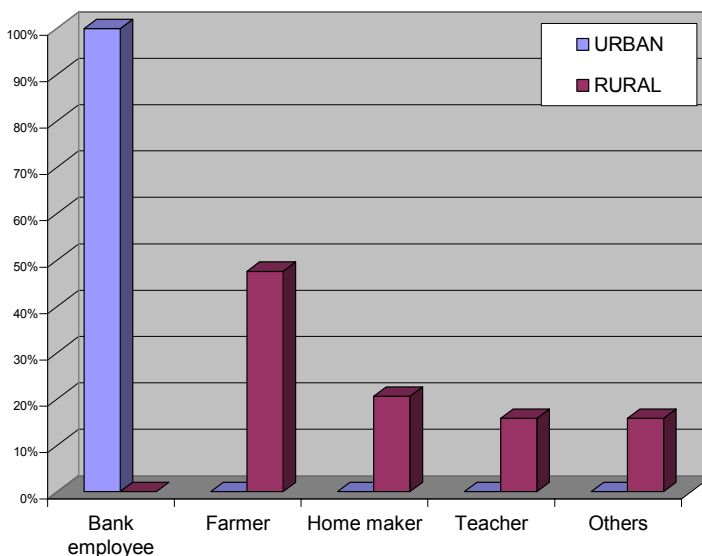


It was found that majority of the study population in the urban sector were bank employees whereas the rural sector was dominated by farmers, followed by homemakers (Table 7).

Table 7
Percentage distribution of occupation

Occupation	URBAN	RURAL
Bank employee	100%	0.00%
Farmer	0%	47.62%
Home maker	0%	20.64%
Teacher	0%	15.87%
Others	0%	15.87%

Fig 10
Graph represents the data from table 7



Comorbidities reported in both urban and rural population were diabetes, hypertension etc. Complications of obesity reported were knee pain, foot pain, hip pain, back pain etc. (Table 8,9).

Table 8
Percentage distribution of co-morbidities

Sex	Co-morbidity	URBAN	RURAL
Male	DM	1.23%	4.35%
	HTN	1.23%	4.35%
	DM+HTN	4.94%	2.17%
	NIL	92.60%	89.13%
Female	DM	0%	0%
	HTN	0%	0%
	DM+HTN	0%	5.88%
	NIL	100%	94.12%

Fig 11
Graph represents the data from Table 8

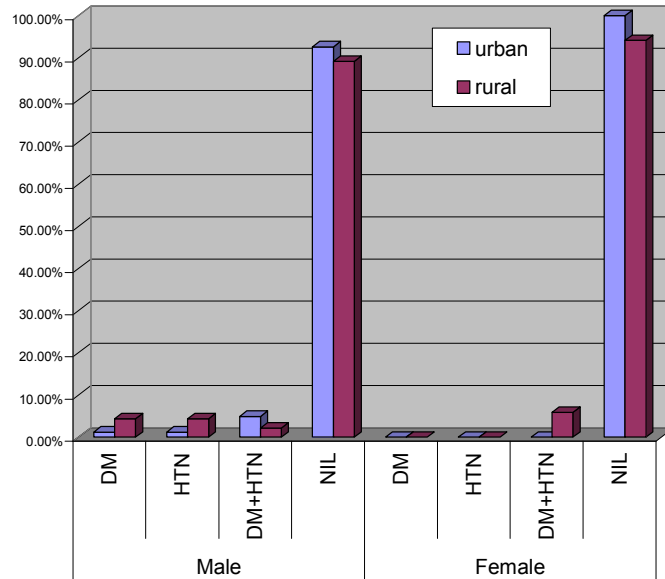
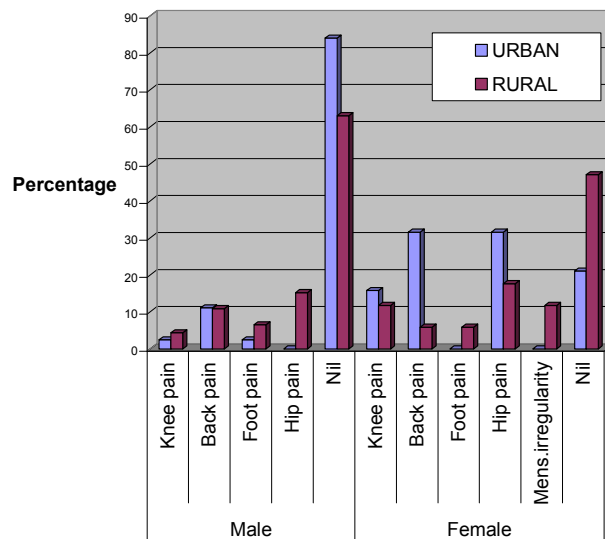


Table 9
Percentage distribution of complications

Sex	Complications	URBAN	RURAL
Male	Knee pain	2.46	4.35
	Back pain	11.11	10.87
	Foot pain	2.46	6.52
	Hip pain	0	15.22
	Nil	84	63.04
Female	Knee pain	15.79	11.76
	Back pain	31.6	5.88
	Foot pain	0	5.88
	Hip pain	31.6	17.65
	Menstrual irregularity	0	11.76
	Nil	21.05	47.06

Fig 12
Graph represents the data from the Table 9

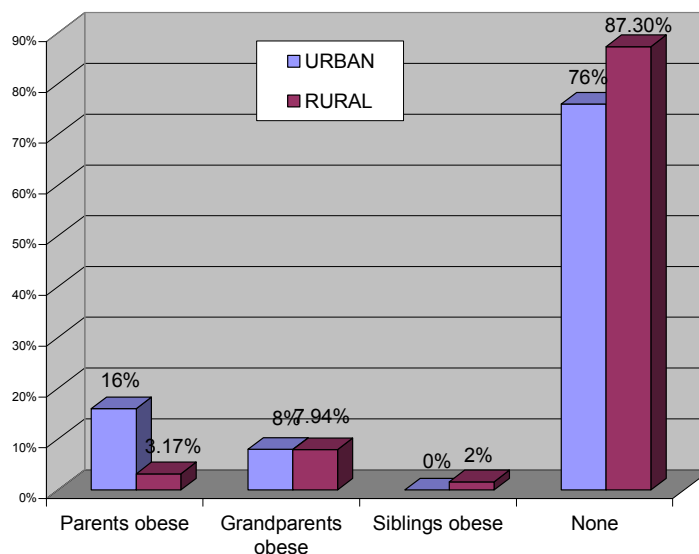


On evaluation, 24% of urban population and 12.4% of rural population were found to have family history of obesity. (Table 10)

Table 10
Percentage distribution of family history of obesity

Family history	URBAN	RURAL
Parents obese	16%	3.17%
Grandparents obese	8%	7.94%
Siblings obese	0%	2%
None	76%	87.30%

Fig 13
Graph represents the data from the table 10



DISCUSSION

In the study, prevalence of overweight and obese patients was more in urban population than in rural. This could be due to changes in lifestyle such as excess caloric intake, reduced physical activity, sedentary lifestyle (work), high fat diet, poor nutrition, intake of carbonated drinks, genetic predisposition etc. In developing countries like India, the problems of poverty and illiteracy are particularly acute in the rural areas. Greater percentage of women reduced and attained ideal weight after counseling than men. The BMI levels of urban men and women were significantly higher than those of their rural counterparts. The prevalence of obesity was also found to be more in urban population than rural population. These

observations were found to be similar to a study reported by Abdul-Rahim HF *et al*¹⁰. The level of education, access to dieticians, fitness centres etc. were also some of the factors which resulted in efficient weight loss. Women were found to be more cooperative than men leading to increased loss of BMI comparatively. The study revealed that patients were not sufficiently aware of obesity and its complications and their realisation of being overweight was inadequate. As accessible and ideally positioned health care providers, pharmacists could potentially contain the rising epidemic of obesity and other lifestyle-related diseases¹³.

CONCLUSION

Counseling to overweight and obese patients of rural and urban sector conducted in Tamil Nadu resulted in efficient weight loss. The study revealed that counseling is a definite factor in helping patients to decrease their total body weight, body mass index and risk of weight related complications. The study also increased the opportunity to identify other

pharmaceutical care needs of patients and helped to establish the role of pharmacists in the management of obesity. Hence it is concluded that pharmacists can play a major role in creating awareness about obesity and its complications. Further studies may be anticipated on the various aspects of obesity and its related parameters to achieve better health care.

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