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Patient Education for Overweight and Obese Patients on Weight Reduction in an Urban Community Pharmacy and its Outcome

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ABSTRACT

All over the world, obesity has almost reached epidemic proportions and India is not far behind. Obesity and overweight are dramatically on the rise particularly in urban settings which have been reported to pose 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 education in overweight and obese patients on weight reduction in an urban community pharmacy in India. A total of 100 subjects who visited the pharmacy 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 male and female population after three months projected a 't' value of 11.80 and 3.08, respectively which was found to be statistically significant at $P=0.001$. Similarly, the mean levels of waist circumference were also found to be significant at $P=0.001$ in both male and female population. It was concluded from the study that patient education provided by the pharmacist helped in decreasing total body weight, waist circumference and risk of weight related complications.

Keywords: Overweight, obese, diet, physical activity, patient education, counseling, body mass index.

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INTRODUCTION

For thousands of years obesity was rarely seen [1]. It was not until the 20th century that it became common, so much so that in 1997 the World Health Organization (WHO) formally recognized obesity as a global epidemic [2]. In many countries all over the world, obesity has almost reached epidemic proportions and India is not lagging far behind [3]. Earlier overweight and obesity were considered a major problem only in high income countries but now it is dramatically on the rise even in low and middle income countries, particularly in urban settings[4].

Thirty years ago, obesity was identified as a nutritional disorder and still continues to be one of the most important, yet preventable health hazards. Worldwide obesity has more than doubled since 1980. Overweight and obesity are the fifth leading risk for global deaths. At least 2.8 million adults die each year as a result of being overweight or obese. In addition, 44% of the diabetes burden, 23% of the ischaemic heart disease burden and between 7% and 41% of certain cancer burdens are attributable to overweight and obesity [4].

In 2008, 1.5 billion adults, 20 years and older, were overweight. Of these over 200 million men and nearly 300 million women were obese. In 2010, around 43 million children under five were overweight. Once considered a high-income country problem, overweight and obesity are now on the rise in low- and middle-income countries, particularly in urban settings. Close to 35 million overweight children are living in developing countries and 8 million in developed countries. Overweight and obesity are linked to more deaths worldwide than underweight. For example, 65% of the world's populations live in countries where overweight and obesity kill more people than underweight. 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 groups [4].

Obesity and overweight pose a major risk for various chronic diseases which includes type 2 diabetes, cardiovascular disease, hypertension and stroke and certain forms of cancer [5-8]. The health consequences range from increased risk of premature death to serious chronic conditions that reduce the overall quality of life [9]. The main causes are increased consumption of energy-dense foods high in saturated fats and sugars and reduced physical activity [10-11]. As populations become more urbanized and as lifestyles shift towards reduced physical activity and increased food consumption, the prevalence of obesity is expected to rise [12]. The fundamental cause of obesity and overweight is an energy imbalance between calories consumed and calories expended. Globally, there has been an increased intake of energy-dense foods that are high in fat, salt and sugars but low in vitamins, minerals and other micronutrients and a decrease in physical activity due to the increasingly sedentary nature of many forms of work, changing modes of transportation, and increasing urbanization [4].

Moderate weight loss of 10 kg 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 cholesterol [13].

WHO projects that by 2015, approximately 2.3 billion adults will be overweight and more than 700 million will be obese [4]. 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 overweight [14]. Hence the study was designed to provide patient education for overweight and obese patients in weight reduction in an urban community pharmacy in Tamil Nadu, India and to evaluate its outcome.

MATERIALS AND METHODS

Study design

A randomised prospective study was conducted in a community pharmacy in Abhiramapuram, Chennai. Visitors to the pharmacy were asked to fill the patient proforma provided to them and for the people who were not able to read and write, the principle investigator filled the answers 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. Overall adiposity was assessed by Body Mass Index (BMI). The BMI was calculated as weight in kilograms divided by height in meters squared.

After consent was procured, the subjects were provided counseling 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. Subjects were advised not to take more than three meals per day and 1-2 snacks per day. They were asked to take the normal food as prepared for the rest of the family members and were advised to avoid high caloric food items. The subjects were asked to walk briskly at least 30 minutes a day. They 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 counseling was provided. The prevalence of overweight and obese patients, both males and females, who had visited the community pharmacy, was reported.

Study site

The study was carried out at a community pharmacy in Abhiramapuram, Chennai.

Study period

The study was conducted for six months, from November 2010 to April 2011.

Inclusion criteria

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

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.

<div align="center">

RESULTS

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A total of 81 males and 19 females were recruited for the study among those who had visited the community pharmacy during the study period (Table 1). The prevalence of overweight and obese patients in the urban population of Abhiramapuram was 74% (n=100) and 26% (n=100), respectively.

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Table 1. Percentage distribution of male and female in urban population of Abhiramapuram

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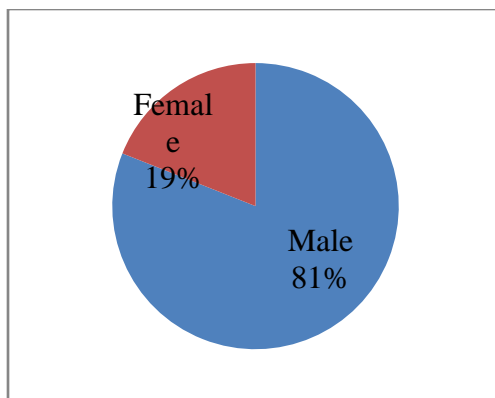| Gender	URBAN
Male (%)	81
Female (%)	19

Figure 1. Percentage distribution of male and female in urban population of Abhiramapuram (Table 1)

The percentage of overweight patients was 79.01% (n=81) and 52.63% (n=19) in men and women, respectively before counseling. After counseling, 68% and 57.9% men and women, respectively were found to be overweight. The percentage of obese patients was 21.03% (n=81) and 46.86% (n=19) in men and women, respectively before counseling. After counseling, 18.51% and 31.6% men and women, respectively were found to be obese. After three months of intervention, 13.58% (n=81) and 10.52% (n=19) men and women, respectively achieved normal standards of weight (Table 2).

Table 2. Percentage distribution of overweight and obesity patients before and after 3 months of intervention

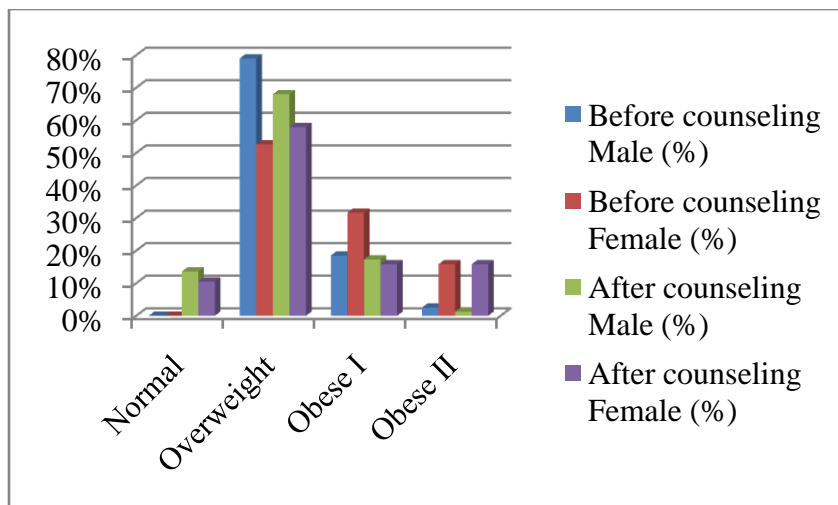| Category	URBAN							
	Before counseling				After counseling			
	Male		Female		Male		Female	
	No.	%	No.	%	No.	%	No.	%
Over weight	64	79.0	10	52.63	55	68	11	57.90
Obese I	15	18.5	6	31.6	14	17.28	3	15.80
Obese II	2	2.51	3	15.8	1	1.23	3	15.80
Normal	0	0	0	0	11	13.58	2	10.52

Figure 2. Percentage distribution of overweight and obesity patients before and after 3 months of intervention

After three months of intervention, the BMI and WC levels were found to be reduced to a greater extent in the males compared to their counterparts. The mean weight, BMI and WC in the male and female population before and after counseling is indicated in Table 3.

Table 3. Mean levels of weight, BMI, WC before and after 3 months of counseling

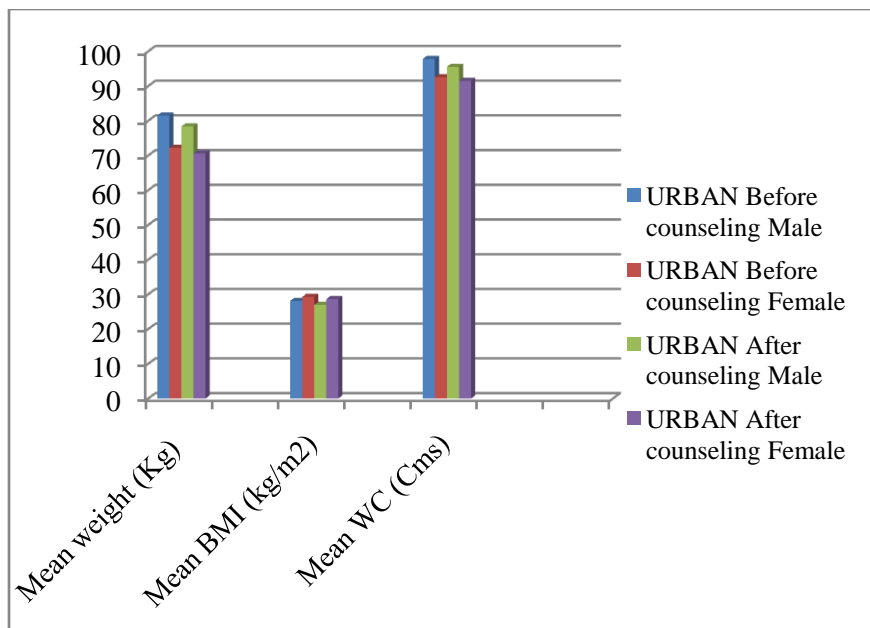| Parameter	URBAN			
	Before counseling		After counseling	
	Male	Female	Male	Female
Mean weight (kg)	81.52	72.21	78.38	70.64
Mean BMI (kg/m^2)	28.09	29.26	26.96	28.63
Mean WC (cms)	97.83	92.56	95.56	91.50

Figure 3. Mean levels of weight, BMI, WC before and after 3 months of counseling in percentage

In accordance with paired t-test, the analysis revealed that comparison of before and after intervention mean levels of BMI in male and female after three months projected a 't' value of 11.80 and 3.08, respectively which was found to be statistically significant at P=0.001. Mean levels of WC in male and female after intervention projected a 't' value of 12.83 and 3.59, respectively which was statistically significant at P=0.001.

The prevalence of smokers was found to be 32.12% in the male population which after counseling depreciated to 17.3%. Similarly, the percentage of alcoholics was 49.37% in male population which after counseling declined to 17.3%. Prevalence of women smokers and alcoholics was not reported. The percentage of tobacco chewers in the male population remained the same before and after counseling at 1.23%. Female tobacco chewers were found to be absent in urban population (Table 4).

Table 4. Percentage distribution of social habits before and after intervention

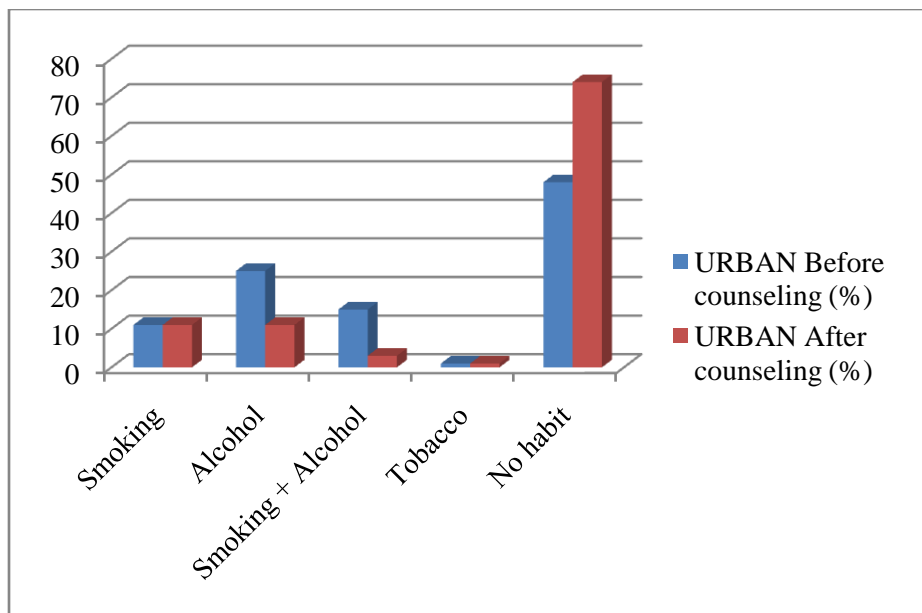| Social habit	URBAN	
	Before counseling (%)	**After counseling (%)**
Smoking	11	11
Alcohol	25	11
Smoking + Alcohol	15	3
Tobacco	1	1
No habit	48	74

Figure 4. Percentage distribution of social habits before and after intervention

Awareness of obesity and its complications was found to be 23.2% before counseling (Table 5). Based on dietary habits, non-vegetarians were found to be more obese and overweight (77.7%) than the vegetarians (Table 6). Regarding their beverage habits, majority of the population (72%) were found to be tea consumers (Table 7). It was found that majority of the study population in this urban sector were bank employees, followed by businessmen and teachers (Table 8). Comorbidities reported were diabetes, hypertension etc. Complications of obesity reported were knee pain, foot pain, hip pan, back pain etc. (Table 9, 10). On evaluation, 24% of the populations were found to have family history of obesity (Table 11).

Table 5. Awareness of overweight and obesity before and after intervention

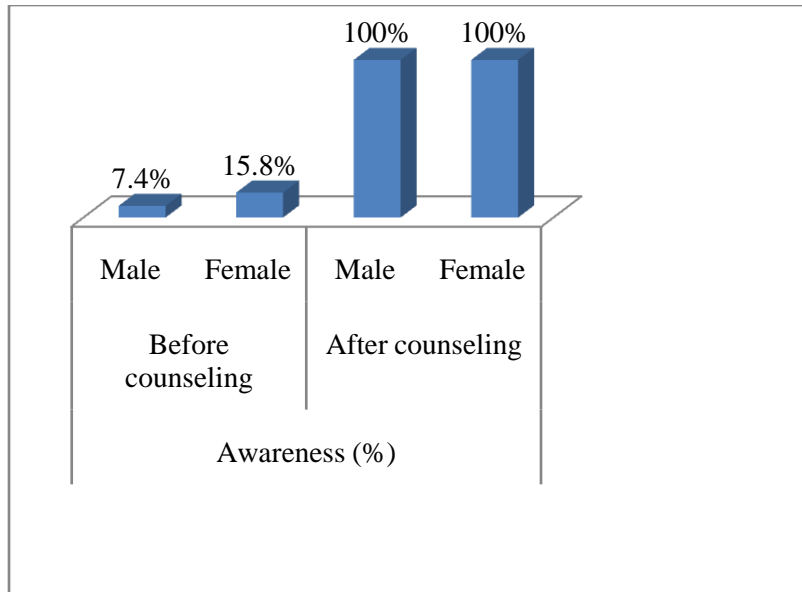| Awareness	URBAN							
	Before counseling				After counseling			
	Male		Female		Male		Female	
	No.	%	No.	%	No.	%	No.	%
Yes	6	7.40	3	15.80	81	100	19	100
No	75	92.60	16	84.21	0	0	0	0

Figure 5. Awareness of overweight and obesity before and after intervention

Table 6. Percentage distribution of diet habit

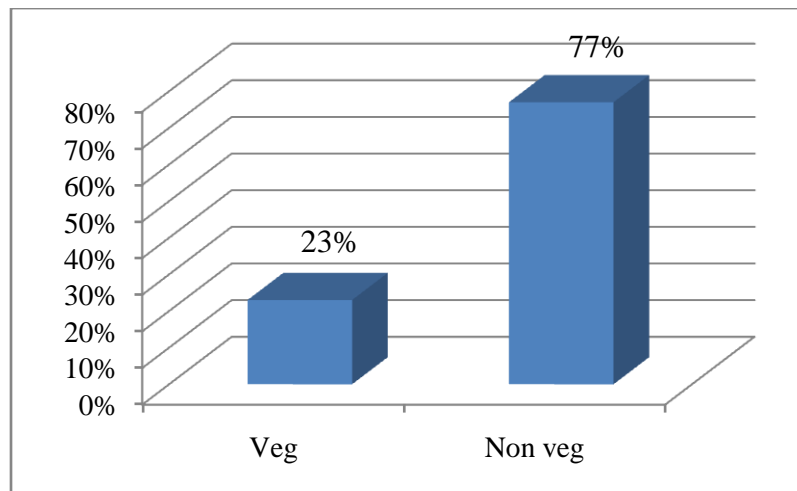| Diet habit	URBAN
Veg	23%
Non veg	77%

Figure 6. Percentage distribution of diet habit (Table 6)

Table 7. Percentage distribution of beverage habit

Beverage habit	URBAN
Tea	72%
Coffee	19%
Cool drinks	9%

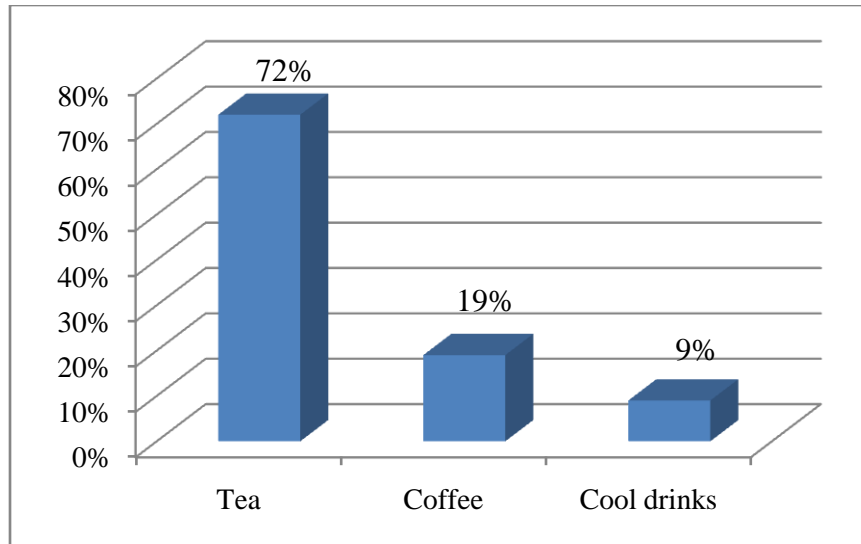**Figure 7. Percentage distribution of beverage habit (Table 7)**

Table 8. Percentage distribution of occupation

Occupation	URBAN	
	Male	**Female**
Bank employee	30.86%	94.74%
Business	24.69%	0%
Teacher	18.52%	5.26%
Driver	17.28%	0%
Others	8.65%	0%

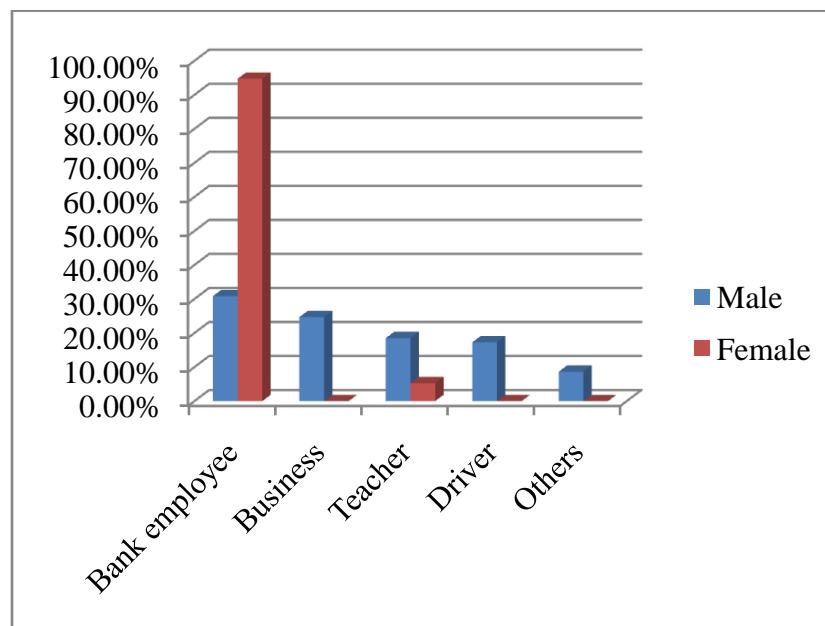**Figure 8. Percentage distribution of occupation**

Table 9. Percentage distribution of co-morbidities

Sex	Co-morbidity	URBAN
Male	DM	1.23%
	HTN	1.23%
	DM+HTN	4.94%
	NIL	92.60%
Female	DM	0%
	HTN	0%
	DM+HTN	0%
	NIL	100%

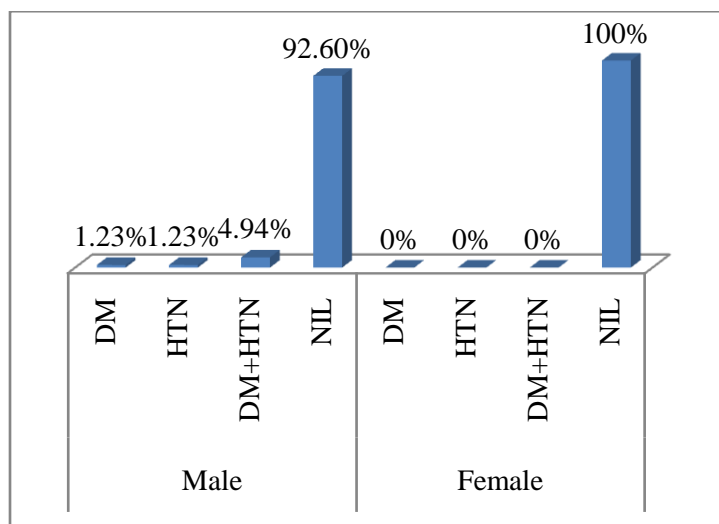**Figure 9. Percentage distribution of co-morbidities**

Table 10. Percentage distribution of complications

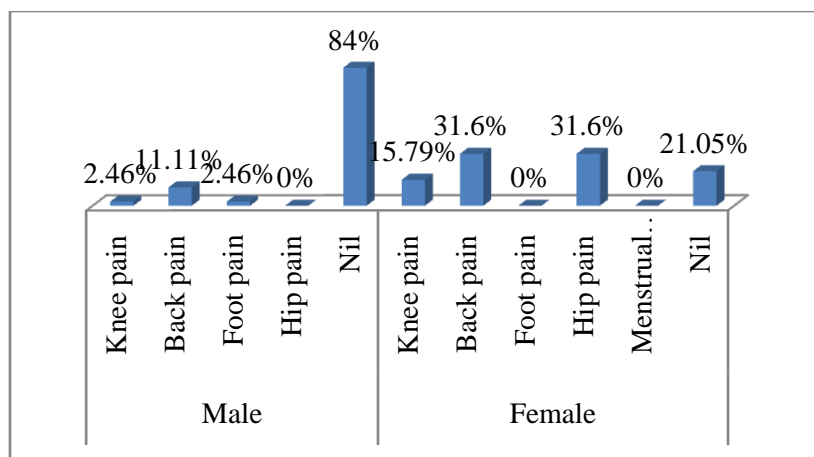| Sex	Complications	URBAN
Male	Knee pain	2.46
	Back pain	11.11
	Foot pain	2.46
	Hip pain	0
	Nil	84
Female	Knee pain	15.79
	Back pain	31.6
	Foot pain	0
	Hip pain	31.6
	Menstrual irregularity	0
	Nil	21.05

Figure 10. Percentage distribution of complications

Table 11. Percentage distribution of family history of obesity

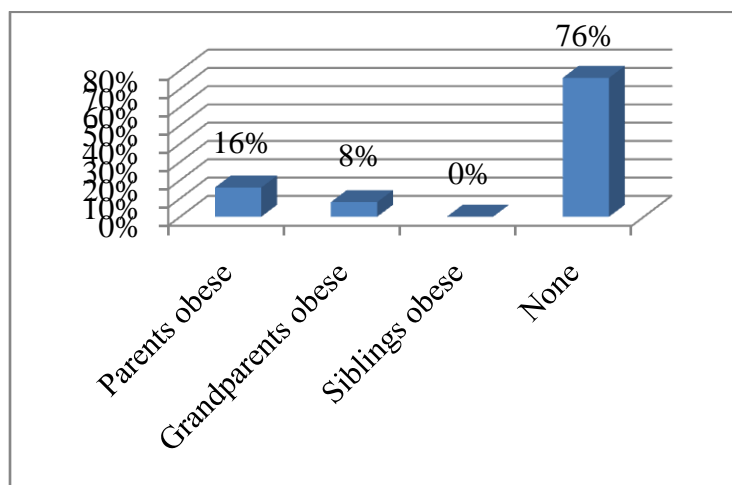| Family history	URBAN
Parents obese	16%
Grandparents obese	8%
Siblings obese	0%
None	76%

Figure 11. Percentage distribution of family history of obesity

DISCUSSIONS

The prevalence of obesity was found to be more in urban population than rural population which 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. According to a study reported by Abdul-Rahim HF *et al* [12]. Hence this study was conducted to provide patient education to overweight and obese patients in an urban community in Chennai, India. The number of women who participated in the study

was less compared to the number of men. This could be because of lack of time and opportunities for the women to involve themselves in regular physical activities since most of them were employed. The mean levels of BMI of women was found to be more than that of men before counseling which could be due to their sedentary lifestyle since most of them were employed in banks. Before patient education was provided, more number of men was found to be smokers, alcoholics and tobacco chewers which may have resulted in increased weight gain and waist circumference than females. Men were found to be more cooperative than women leading to increased loss of total weight, BMI and WC comparatively. The level of education, access to dietiticians, fitness centres etc. were also some of the factors which resulted in efficient weight loss. 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 affect the rising epidemic of obesity and other lifestyle-related diseases [15].

CONCLUSION

The study concluded that efficient weight loss was achieved in overweight and obese patients of Abhiramapuram community in Chennai, Tamil Nadu. Pharmacists play a major role in helping patients to decrease their total body weight, body mass index and risk of weight related complications. They also help in creating awareness about obesity and its 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.

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