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ASSESSMENT OF QUALITY OF LIFE AND CO-MORBIDITIES AMONG CARDIOVASCULAR RISK OBESE PATIENTS AT MULTI SPECIALITY HOSPITAL, BHEEMAVARAM, ANDHRA PRADESH

Gummuluri Jyotsna*[1], Siram Lakshmi Harika[2], Dr. K. Prasad[3], Dr. STK Sridhar[4] and Dr. K. Chandra Sekhar[5]

[1,2]6th Year Student of Pharm D. at Sri Vishnu College of Pharmacy, Bhimavaram, Andhrapradesh, India.
[3]Principal of Sri Vishnu College of Pharmacy, Bhimavaram, Andhrapradesh, India.
[4]Faculty at Department of Pharmacy Practice at Sri Vishnu College of Pharmacy, Bhimavaram, Andhrapradesh, India.
[5]Professor of Community Medicine and Faculty at Saudi Board Family Medicine Program at Qassim Province, Saudi Arabia.

***Corresponding Author: Gummuluri Jyotsna**
6th Year Student of Pharm D. at Sri Vishnu College of Pharmacy, Bhimavaram, Andhrapradesh, India.

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ABSTRACT

Background: The two most expeditiously growing public health challenging domains across the globe are 'Obesity' and 'Overweight'. It can cause the Coronary heart disease, dyslipidemia, hypertension, stroke, some forms of cancer, type 2 diabetes mellitus, gallbladder disease, osteoarthritis and gout, and pulmonary diseases, including sleep apnoea are the further metabolic consequences resulting from obesity which acts as a major risk factor. In general clinical practice, body mass index (BMI) and to a lesser extent waist circumference (WC) are extensively used measures to assess an individual's health risk. **Objectives:** The objective of the current study is to study the Quality of Life of Obesity patients and assess the co-morbidities especially cardiovascular risks based upon the measurement of Waist Circumference and to identify the aetiology of obesity. **Materials & Methods:** This study was conducted in a multi speciality hospital, among 190 individuals during the period from October 2017 to March 2018. To obtain a reliable and consistent analysis all the information regarding subjects were clearly noted including height, weight, BMI, waist circumference (WC) and hip circumference. Both pharmacological therapy (ORLISTAT) and non-pharmacological therapy includes patient counselling was given to the patients who were enrolled in the study. Multivitamin supplement and protein powder was given to all the patients and in addition ORLISTAT was given to the patients whose BMI is>35. A total 190 patients were studied by using EURO QoL 5D-5L questionnaire. **Results:** It was observed in the study that females (81.4%) are more physically inactive and are more prone to obese than males. Our findings indicate that 50.52% of women and 44.74% of men falls under high health risk category based on waist circumference and 4.21% of men and less than 1% of women are having moderate health risk. Based on waist to hip ratio 78.95% of patients are having high health risk followed by 9.47% of patients are in moderate risk category and 11.58% of patients are in low risk category. The results of the treatment shows that in morbidity category BMI is reduced by 5.26%, followed by 10% reduction in class-III obesity and 3.16% reduced in overweight category. It was also observed from the study that 7.9% of patients falls into normal BMI after treatment. The scores of these five dimensions were higher before the counselling in all the patients and significant improvement was noticed after counselling in the following domains namely: mobility (mean=1.87), self-care (mean=1.02), usual activities (mean=1.97), pain/discomfort (mean=1.88), anxiety/depression (mean=1.58), index value (mean=83124), visual analogue scale (mean=83.05) during their hospital visit, while the scores were decreased after the counselling. **Conclusions:** Based on the study results. Obesity was more often in females with less awareness and less physical activity than in males. Decrease in cardiovascular risk was observed in obese patients after pharmacological and non-pharmacological therapy. Most common aetiological factor for obesity was found to be physical inactivity, hereditary and fatty food intake. Most common co-morbidities found along with obesity include Gastritis, Hypertension and Diabetes Mellitus.

KEYWORDS: Age, Sex, Body mass index, Waist Circumference, Co-morbidities, Quality of life.

INTRODUCTION

The two most expeditiously growing public health challenging domains across the globe are 'Obesity' and 'Overweight'. As per World Health Organization (WHO) records established in 2010, a total estimation of 1.5 billion adults and an immense count of 43 million

children under 5 years old were said to be overweight. In general, greater than one in ten of the world's adult individuals are obese. The fifth leading risk for worldwide deaths is negotiated by Obesity and Overweight.[1]

Coronary heart disease, dyslipidaemia, hypertension, stroke, some forms of cancer, type 2 diabetes mellitus, gallbladder disease, osteoarthritis and gout, and pulmonary diseases, including sleep apnoea are the further metabolic consequences resulting from obesity which acts as a major risk factor. Overeating, unhealthy high-fat foods and sedentary lifestyles are the three most common precipitating factors leading to the development of overweight and obesity.[1] A modest decrease of 5-10% body weight helps in giving a positive impact on morbidity scale and quality of life of patients who are suspected to have cardiovascular risk due to obesity.[2]

As per the NHANES III, 54.9% of U.S. adults aged 20 years and older are overweight (body mass index [BMI] 25.0-29.9 kg/m^2) or obese (BMI $\geq$ 30kg/m^2). It has been firmly said that adiposity and the development of hypertension shares a strong epidemiological link together.[3] In defiance of significant adiposity, most of the obese patients will remain normotensive. The heterogeneity of clinical and biological manifestations of obesity might result as a contribution from the difference in the distribution of adipose tissue.[3] In general clinical practice, body mass index (BMI) and to a lesser extent waist circumference (WC) are extensively used measures to assess an individual's health risk. However, WC can be a better measure than BMI, where we can estimate the harmful deposition of adipose tissue in the visceral space.[4]

For WC, three categories have been defined to indicate the increasing health risk with increasing WC.[4]

- men:<94cm, 94–101cm and <102cm,
- women:<80cm, 80–87cm and <88cm.

A relatively comprehensive set of predictors for Health Related Quality of Life (HRQoL) among obese youth (mean age = 12.7 years) like depression, social support, degree of overweight and socioeconomic status were said to be significantly associated with HRQoL.[5]

Irrespective of BMI the increase in the WC, will result in increased inflammatory markers[6,7] in the circulation and might also lead to insulin resistance[8,9], type 2 diabetes mellitus,[10,11] dyslipidemia,[12,13] coronary heart disease,[14,15] etc. Since ages the relation between Moderate to vigorous physical activity (MVPA) and obesity has been acknowledged. Also the relation between the BMR and the MVPA which can be explained in multiple path-ways but, finally results in the positive and suppressive effect on energy expenditure and appetite.[16,17]

Sedentary life style the risk factor of obesity can be examined by the time spent using the computers and laptops and also watching the television. It is postulated that the time spent in using laptops and computers and also watching TV may impact weight status via simple displacement of MVPA,[18] and indirectly in the intake of energy. Snack intake behaviour and fast food consumption have a close monitored association with the time spent watching TV.[19,20]

Health Related Quality of Life (HRQoL) is the standard, approved and authoritative measure to assess the physical, psychological, and social effects of obesity and also its treatment. This helps us to know effect of co-morbidities in obese people by asking simple questions to the obese in various aspect like functional status, psychosocial wellbeing, health perceptions and disease or treatment allied symptoms which are easy to understand and analyze.[21,22,24] QoL can be used to find the chances of survival and mortality in an individual.[23]

WHOQoL Group of world Health Organization (WHO) has defined HRQoL in various sectors of life like, physical, psychical, social and emotional.[25] QoL was first mentioned and described in a book of Economics and Welfare by Pigou in the year 1920. To demonstrate the score of well-being, the concept of QoL was first introduced by surveying the population of USA in the years 1960s and 70s.[26]

- EQ-5D-3L: The most commonly used questionnaire is the EQ-5D-3L, which has 3 levels of severity for each dimension in 243 health states.[28]
- EQ-5D-5L: Advanced version of EQ-5D-3L developed in the year 2011, with 5 levels of severity for each dimension in 3125 health states.[28]

Thus, to better understand the HRQoL in the adult obese population, we used the five-domain five-level EQ-5D-5L Questionnaire and Visual Analogue Scale (VAS) to examine the socio-demographic, personal and family health history, lifestyle and psychosocial factors.

Based on the above study situations, the present study is to investigate the relation between 'Health-Related Quality of Life (HRQoL)' and Obesity associated co-morbidities. The current study is also designed to document the waist circumference and its relation with obesity and associated co-morbidities especially cardiovascular risk.

OBJECTIVES

1. To evaluate the cardiovascular risk in obese people based on waist circumference (WC).
2. To assess the quality of life in obese people who are attending the hospital.
3. To assess co-morbidities and aetiology of obesity in study population.

MATERIALS AND METHODS

Study Design: Prospective interventional Study.

Study Duration: 6 months (october-2017 to march-2018).

Study Department and Site
Department of general medicine, Varma Hospitals, Bhimavaram, West Godavari district, Andhra Pradesh, India.

Inclusion Criteria
- Age group: >18 years (both sexes).
- People who are obese (BMI >25 or more).
- People who are willing to participate in the study.

Exclusion Criteria
- Paediatrics.
- Pregnant women and lactating mothers.
- Bed ridden patients.
- People who are not willing to participate in the study.

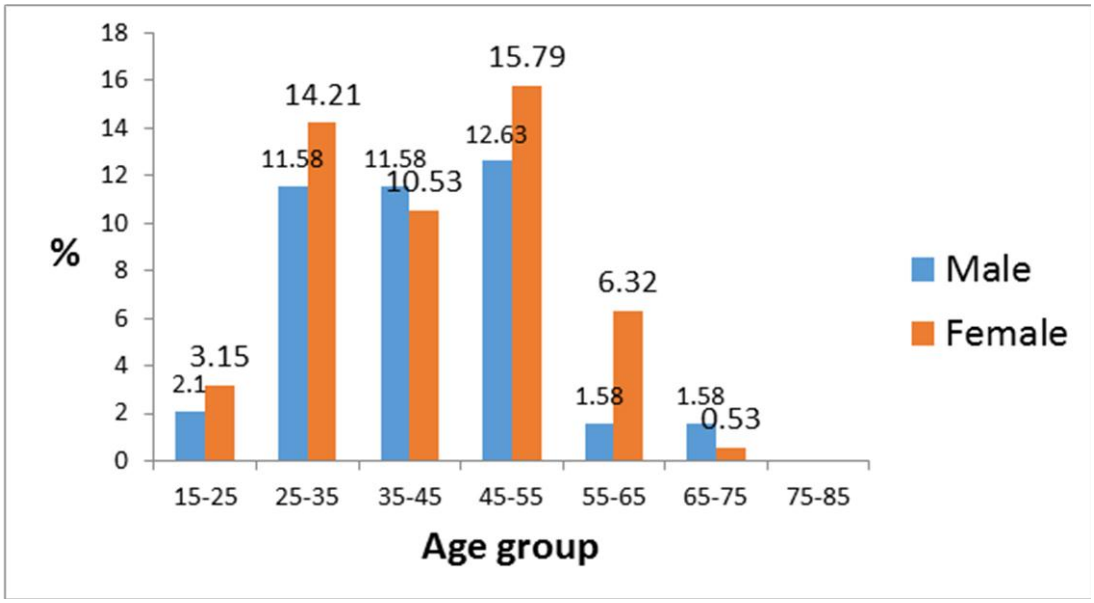
METHODS
Written informed consents were obtained from all the patients who participated in the study. Patient Demographic Data form was obtained from all the patients who participated in the study and assessment of Quality of Life (QoL) was done using the, EQ-5D-5L Questionnaire (28).

MATERIALS
The materials used for the study includes weighing machine for measuring weight, stadiometer to measure height and measuring tape to measure waist circumference and hip circumference.

Study Procedure
This study was conducted with the approval of Institutional Ethical Committee (IEC), prior to the initiation of the study. Informed consent was obtained from the subjects. To obtain a reliable and consistent analysis all the information regarding subjects were clearly noted including height, weight, BMI, waist circumference (WC) and hip circumference. Quality of life(QoL) of total 190 patients were studied by using EURO QoL 5D-5L questionnaire.

Statistical Analysis
Data was recorded on a predesigned form and was managed by using Microsoft Excel worksheet (Microsoft Corp, Redmond, WA). All the entries were double-checked for any possible error. A categorical variable was reported as counts and percentages and chi$^{[2]}$ test was used for testing. For normally distributed variables, comparison across the groups or significance was done by using the t-test. So, a p value of less than 0.05 (i.e< 0.05) was considered significant. The statistical software IBM SPSS Statistics Version 20.0 (IBM Corp Somers NY, USA) was used for statistical data analysis.

RESULTS



Graph -1 Distribution of Patients According To Age Group & Gender In Percentage.

Table 1: Distribution of Subjects According To Occupation (N-98).

Occupation	Male	Female	Total
Farmer	**13 (6.84%)**	**01 (0.53%)**	**14 (7.37%)**
Business	**47 (24.74%)**	**02 (1.05%)**	**49 (25.79%)**
Skilled Employee	**21 (11.05%)**	**02 (1.05%)**	**23 (12.10%)**
Labourer	**04 (2.10%)**	**01 (0.53%)**	**05 (2.63%)**
Non worker	**06 (3.16%)**	**01 (0.53%)**	**07 (3.68%)**

In the study population, majority (26%) from business occupation.

Table 2: Distribution of Patients According To Aetiology.

AETIOLOGY	MALE	FEMALE
STRESS	38(40.8%)	29(29.8%)
FAT INTAKE	47(50.5%)	46(47.4%)
SMOKING	25(26.8%)	0
ALCOHOL	22(23.6%)	0
HERIDATORY	45(48.3%)	55(56.7%)
PHY.INACTIVE	70(75.2%)	79(81.4%)
DYSLIPIDAEMIA	5(5.3%)	3(3%)
THYROID	2(2.1%)	23(23.7%)
HARMONE INTAKE	0	9(9.2%)
HYSTERECTOMY	0	8(8.2%)

Chi-square value for the above table is 114.375 with p-value-0.031 ie; P<0.05

In the study population, about 75.2% of males were physically inactive and 81.4% of females were physically inactive. Next to that fat intake was 50.5% and 47.4% consecutively males and females.

Table 3: Distribution of Patients According To Comorbidities.

COMORBIDITY	MALE	FEMALE
OSTEOARTHRITIS	(11.8%)11	37(38.1%)
DIABETES	40(43%)	23(23.7%)
HYPERTENSION	42(45.1%)	35(36%)
HEAD ACHE	0	3(3.09%)
PCOS	0	15(15.4%)
CAD	12(12.9%)	1(1.03%)
GI DISTURBANCES	39(41.9%)	45(46.3%)
HYPOTENSION	0	9(9.2%)
THYROID	2(2.15%)	21(21.6%)
BACK PAIN	4(4.3%)	9(9.2%)
VARICOSE	1(1.07%)	1(1.03%)
INSOMNIA	1(1.07%)	1(1.03%)
OTHERS	10(10.7%)	20(20.6%)

Chi-square value for the above table is 122.837 with p-value-0.018 ie; p<0.05

Out of 190 study sample, 45.1% of the males were having hypertension, 43.1% were diabetes and 41.9% were gastrointestinal disturbances. Similarly among the females, 36% hypertension and 23.7% diabetes, 46.3% gastrointestinal disturbances and 38.1% osteoarthritis.

Table 4: Distribution of Patients According To Bmi Category.

BMI Range & Category	Male	Female	Total
Overweight or Mild (25-29.9)	10 (5.26%)	12 (6.32%)	22 (11.58%)
Moderate obese (30-34.9)	56 (34.9%)	52 (27.37%)	108 (56.84%)
Obesity (35-39.9)	20 (10.53%)	27 (14.21%)	47 (24.74%)
Morbidity (≥ 40)	7 (3.68%)	6 (3.16%)	13 (6.84%)

In the study population, there was about 56.8% were having BMI 30-34 (Moderate Obese) and 6.84% were having BMI more than 40.

Table 5: Assessment of Cardiovascular Risk Based On Waist Circumference (Wc) Before And After Pharmacological And Non Pharmacological Therapy.

	W.C. Range	Male	Female	Total
BEFORE TREATMENT	Low Risk; Male-< 37 Female-< 31.5	00	00	00
	Moderate: Male – 37-40 Female –31.5-35	08 (4.21%)	01 (0.53%)	09 (4.74%)
	High Risk: Male - > 40 Female -> 35	85 (44.74%)	96 (50.52%)	181 (95.26%)
AFTER TREATMENT	Low Risk; Male-< 37 Female-< 31.5	01 (0.53%)	00	01
	Moderate: Male – 37-40 Female –31.5-35	26 (13.6%)	23 (12.1%)	49 (25.7%)
	High Risk: Male - > 40 Female -> 35	66 (34.7%)	74 (38.9%)	140 (73.6%)

Chi-square value for the above table is 6.0314 with d.f.- 1 and P < 0.05

In the study population, among males about 44.74% patients were high risk and after treatment high risk patients were 34.7%. Similarly among females about 50.52% patients were high risk and after treatment high risk patients were 38.9%.

Table 6: Comparision of Bmi Before and After Pharmacological and Non Pharmacological Therapy.

BMI Grades	Before Treatment (n=190)	After Treatment (n=190)
Normal; 18.5- 24.9	00	15 (7.90%)
Overweight or Mild; 25-29.9	22 (11.58%)	42 (22.10%)
Moderate; 30-34.9	108 (56.84%)	102 (53.68%)
Obesity; 35-39.9	47 (24.74%)	28 (14.74%)
Morbidity; ≥ 40	13 (6.84%)	03 (1.58%)
Total	190 (100.0%)	190 (100.0%)

X^2 value is 29.0644; d.f. = 4; P <0.00001.

In the study population, all the participants were selected BMI more than 25. After therapy about 7.90% were become normal BMI (18.5 to 25). Similarly > 40 BMI also reduced from 6.84% to 1.58%.

Table 7: Comparision of Mean Bmi Before and After Pharmacological and Non Pharmacological Therapy.

Condition	Before Treatment	After Treatment
Patient with Orlistat	38.53	35.05
Patient without Orlistat	31.6	30.21

In the study population before treatment the mean BMI was 38.53 and after treatment the mean BMI was 35.05. Similarly without Orlistat, the mean BMI was 31.6 and after treatment the mean BMI was 30.21.

Table 8: Quantitative Variabels of Eq-5d-5l Quality of Life Before and After Pharmacological And Non Pharmacological Therapy.

Paired Samples Statistics				
Items	**Mean**	**N**	**Std. Deviation**	**Std. Error Mean**
Mobility	1.87	190	.787	.057
mobility1	1.57	190	.576	.042
self-care	1.02	190	.125	.009
selfcare1	1.01	190	.073	.005
usual activities	1.97	190	.819	.059
usual activities1	1.61	190	.587	.043
pain/discomfort	1.88	190	.836	.061
pain/discomfort1	1.71	190	.746	.054
anxiety/depression	1.58	190	.736	.053
anxiety/depression1	1.33	190	.562	.041
INDEX VALUE	.83124	190	.109044	.007911
Index1	.85986	190	.101804	.007386
VISUAL ANALOGUE SCALE	83.05	190	11.435	.830
VISUAL ANALOGUE SCALE1	85.62	190	10.418	.756
EQ-5D-5L	19970.37	190	7943.174	576.258
Profile1	16868.96	190	5799.175	420.716

DISCUSSION

A prospective interventional study was conducted among out-patients as well as in-patients those who visit tertiary care hospital in Bhimavaram for management of obesity. Drugs and non-pharmacological therapy plays a major role in improving human health, promoting well-being and reducing the mortality and cardiovascular risks in obese patients. This study was conducted to know about Quality of life in obese patients and to assess the cardiovascular risk in obese patients based on waist circumference and waist to hip ratio.

The total of 190 patients were enrolled under this study based on inclusion and exclusion criteria, where the distribution of females (51.05%) is greater than males (48.95%). In this study the patients of 18 years and age above were enrolled and major proportion of them were in the age group between 45-55 years. It was observed in this study that highest percentage of obesity was seen in housewives (44.74%), followed by business people (25.79%).

In our study most of the patients with physical inactivity as the main risk factor have ended up becoming obese. It was also observed in our study that females (81.4%) are more physically inactive when compared to males (75.2%), fat intake (50.5%) in males and (47.4%) in females, stress (40.8%) in males and (29.8%) in females, smoking (26.8%) in males and (0%) in females, alcohol (23.6%) in males and (0%) in females, hereditary (48.43%) in males and (56.7%) in females, dyslipidemia (5.3%) in males (3%) in females, thyroid (2.1%) in males and (23.7%) in females, hormone intake (9.2%) in females, hysterectomy (8.2%) in females. Potential etiological factors were categorized based on the information available from the data collection form which included stress, heavy fat intake, smoking, alcohol, hereditary, dyslipidemia, thyroid, hormone intake, hysterectomy.

In present study most of the patients were suffering from gastric problem, which was a major co-morbidity in common. It was also observed in our study that females in case of gastric problem (43.6%) showed more predominance than males (41.9%). Hypertension was another co-morbidity which is more predominant in males (45.1%) when compared to females (36.0%), followed by diabetes mellitus which is 43% in males and 23.7% in females. In addition to this coronary artery disease (CAD) is showing much more predominance in males (12.9%)when compared to females(1.03%), osteoarthritis (11.8%) in males and (38.1%) in females, diabetes (43%) in males and (23.7%) in females, headache (0%) in males and (3.09%) in females, PCOS

(15.4%) in females, hypotension (0%) in males and (9.2%) in females, thyroid (2.15%) in males and (21.6%) in females, back pain (4.3%) in males and (9.2%) in females, varicose (1.07%) in males and (1.03%) in females, insomnia (1.07%) in males and (1.03%) in females, others (10.7%) in males and (20.6%) in females.

Potential co-morbidities were categorized based on the information available in the data collection form which included osteoarthritis, diabetes mellitus, hypertension, headache, PCOS, CAD, gastric problem, hypotension, thyroid problem, back pain, varicose veins, insomnia and others respectively.

It was observed that 11.58% of patients were into overweight category and 56.84% of patients into moderate obesity (class-I) followed by24.74% of patients were under class-II obesity. It was also found that 6.84% of patients were with morbid obesity. Similar results were observed with Ozuturk et al conducted study in Istanbul among patients in home care settings.[33]

In general clinical practice, Body Mass Index (BMI) and to a lesser extent Waist Circumference (WC) are extensively used measures to assess an individual's health risk. However, WC can be a better measure than BMI, where we can estimate the harmful deposition of adipose tissue in the visceral space.[4] Our findings indicated that 95.26% of patients were under high risk to health category based on waist circumference and 4.74% of patients falls under moderate risk to health category. There were no patients included with low risk to health category. After pharmacological and non-pharmacological therapy it was observed that there was a decrease in waist circumference of patients as 73.6% of patients are in high risk category and 25.7% of patients are in moderate risk category followed by 0.53% of patients falls under low risk category. This shows that there is a decrease in cardiovascular risk of patients after therapy when compared to before.[30]

In our study both pharmacological therapy (ORLISTAT) and non-pharmacological therapy was given to the patients who were enrolled in the study. Multivitamin supplement and protein powder was given to all the patients. But ORLISTAT was given to patients only with BMI >35. It was observed from our study that in patients who did not take ORLISTAT, there was a decrease in BMI from 31.6 to 30.21, and in patients who took ORLISTAT there was a decrease in BMI from 38.53 to 35.05. From this we can say that patients who were treated with ORLISTAT showed more decrease in BMI when compared to patients who were not treated with ORLISTAT. The results of the treatment showed that in morbidity category BMI was reduced by 5.26%, followed by 10% reduction in class-III obesity and 3.16% reduced in overweight category. It was also observed from our study that 7.9% of patients were into normal BMI after treatment.

Health Related Quality of Life was measured before counseling the patients during their visit to hospital and 3 months after the counseling was done. The EQ-5D-5L is a simple, generic health-related quality of life (HRQOL) instrument that is self-administered and is widely used as a patient reported outcome measure. It comprises five health dimensions (mobility, self-care, usual activities, pain/discomfort and anxiety/depression).[28] Thus, to better understand the HRQOL in the adult obesity population, we used the five-domain five-level EQ-5D-5L Questionnaire and Visual Analogue Scale (VAS) to examine the socio-demographic, personal and family health history, lifestyle and psychosocial factors.[32]

The scores of these 5 dimensions were compared before and after the counseling, higher the scores of the dimensions higher the impact of obesity on patient's health related quality of life. The scores of these five dimensions were higher before the counseling in all the patients: MOBILITY (mean=1.87), SELF-CARE (mean=1.02), USUAL ACTIVITES (mean=1.97), PAIN/DISCOMFORT (mean=1.88), ANXIETY/DEPRESSION (mean=1.58), INDEX VALUE (mean=83124), VISUAL ANALOGUE SCALE (mean=83.05) during their hospital visit, while the scores were decreased after the counseling like MOBILITY (mean=1.57), SELF-CARE (mean=1.01), USUAL ACTIVITIES (mean=1.61), PAIN/DISCOMFORT (mean=1.71), ANXIETY/DEPRESSION (mean=1.33), INDEX VALUE (mean=85986) and VISUAL ANALOGUE SCALE (mean=85.62). Almost all the patients have improved after patient counseling and therapy in all 5 dimensions, index value and visual analogue scale (VAS).

This significant improvement in all 5 dimensions indicates that patient counselling on obesity, pharmacological therapy with ORLISTAT and non-pharmacological therapy had shown significant impact on HRQOL in the patients. On the whole, the present study results only on 190 sample and results of this study cannot be generalized to the whole population of Bhimavaram population. Need large scale similar studies are required to substantiate the present study results.

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Conflict of interest: None.
Institutional ethical Committee clearance taken.

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