EFFECTIVENESS OF INTERVENTIONS TO REDUCE WEIGHT AMONG THE WOMEN WITH OBESITY

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Abstract

A Quasi- experimental study (before-and-after with control group design) was conducted to assess the effectiveness of Interventions to reduce weight among women with obesity using Quantitative Evaluative approach. The study setting adopted was two stage random sampling technique with lottery method. Using Non probability purposive sampling technique, Each 100 women with obesity aged 20- 39 years were selected for experiment and control group. Established Reliability and Pilot study.

In pretest, both groups' baseline data obtained through Structured Interview Schedule, obesity parameters (BMI, WC) assessed to identify the level and health risk status. Implementation of Interventional Module on Interventions to reduce weight was administered to experiment group subjects for 12 weeks. Posttest conducted for both groups. The collected data were analyzed using descriptive and inferential statistics.

The findings revealed highest percentages of women with obesity in control and experiment group were aged 35-39 years with primary/middle school education. Mostly Hindus, married, non-vegetarian, sedentary workers, nuclear family, monthly income Rs.10,001–15,000, having regular menstrual cycle and children, fat distributed above waist line, sleep pattern >6 hours/day, no family history of obesity and social habits.

The comparison and distribution of mean posttest values of BMI (32.56 ± 3.46 and 28.44 ± 2.89), WC (40.75 ± 4.25 and 36.11 ± 3.96) among women with obesity between control and experiment group shows high mean difference of 4.12, 4.64 respectively. The unpaired 't' test values of BMI (9.12), WC (5.28) found to be > than the table value (3.291) at $p<0.001$.

The paired 't' test analyzed the significant difference in mean pre and posttest values of BMI (32.09 ± 3.26 and 28.44 ± 2.89), WC (40.44 ± 4.25 and 36.11 ± 3.96) among women with obesity in experiment group shows high mean difference 3.65, 4.33. The 't' values of BMI (40.78), WC (31.05) found to be > than the table value (3.291) at $p<0.001$. The mean posttest values of BMI and WC showed significant difference in experimental group.

Chi square analysis between posttest values of BMI, WC found associated only with the duration of sleep at night ($p<0.05$) and social habits ($p<0.001$) with BMI, age in years and educational status ($p<0.001$) with WC. The implementation of Interventional Module on Interventions to reduce weight found to be effective in reducing weight among the subjects in experimental group.

Key Words: BMI – Body Mass Index WC – Waist Circumference CVI – Content Validity Index

NCD –Non Communicable Diseases WHR–World Health Report WCI–Weight Control Information

INTRODUCTION
Women are responsible for the miracle of birth, embodiment of morality, image of society, guardian of respect, provider and honor of a family. They feel constrained by too many pressures like work, kids and ageing parents, also worried about their health but, often apologize for it **(Deborah Olsen, 2015)** The women is globally affected with NCD which kills them more and more each year to a large extent due to tobacco use 6 million, raised blood pressure 7.5 million, increased cholesterol 2.6 million, cancers 2 million, physical inactivity 3.2 million, unhealthy diet 3.8 million, overweight and obesity 2.8 million **(WHR, 2012)** Women with obesity are 297 million worldwide and 300 million globally with an age of ≥ 20 years. **(Priya Kanayson, 2015).** The WHO recognizes the critical importance of reducing unhealthy diet & physical inactivity to halt the rise of global obesity by 2025, also recommends obese persons to participate in a medically supervised weight loss treatment plan of eating fewer calories than the body needs, 30 minutes brisk walk exercise most times a week & learning skills to change unhealthy behavior **(Michael D Jensen, 2014)**

REVIEW OF LITERATURE
India is the third most obese country in the world just behind United States and China. It has jumped to 3rd rank with 20 million obese women and reached the obesity epidemic proportions in the 21st century affecting 5% of the country's population. Women aged >20 years have higher rates of (36%) obesity and (8.3%) extreme obesity **(Neetu Chandra Sharma, 2014).**
The level of obesity was found among 266 adult women in Sripuram, Tamil Nadu through house-to-house visit. Anthropometric Parameters were assessed and calculated based on their height and body weight. The level of BMI revealed that 46.7% of them were overweight and 5.9% of them were obese whereas, 44.8% had increased waist circumference **(Jakicic Amy D, 2012).**
The prevalence of obesity estimated through a cross sectional survey, conducted among 500 adult women (20-49 yrs) in Salem; Tamil Nadu, reported that the women with overweight & obesity was 54% and 21.6% says **Man Mohan Gupta et al., (2011).**
A study conducted among 100 household adult women with obesity in Mecheri, Salem District, Tamil Nadu to identify the prevalence & risk factors associated with obesity, found that 53% were overweight & 47% were obese **(Parimallavalli R, 2009).**
A cross sectional study to determine the prevalence of obesity among 262 females(20-39 yrs) conducted in Vinayaka Mission Medical College & Hospital, Salem reported 32.44% were overweight with BMI: 25-29.9 kg/m^2, Obesity 28.24% with BMI 30-35 kg/m^2, high Waist Circumference 59.15% respectively **(Desigamani, 2011).**

NEED FOR THE STUDY
Globalization – the inexorable spread of knowledge, technology and culture had increased people's wealth as well as their waistlines. **(Malik VS, 2013)**
Increased BMI is an indicator of obesity and major risk factor for NCD occurrence. Women typically collect fat in their hips and buttocks. Excess abdominal fat is an independent risk factor denotes waist circumference >88cm **(WCI, 2010.)**
The National Institute for Health and Clinical Excellence recommends adults for real target of weight loss as maximum 0.5- 1 kg/week with total loss of 5–10% of original body weight over a period of intervention. A Low calorie diet can be used for maximum 12 weeks continuously or intermittently for 2–4 days/week to reduce weight for obese people, also with BMI < 40 for a loss of 5% body weight and BMI > 40 to aim for >10% weight loss **(NIHCE, 2014)**
Nursing Interventions improves the cognitive information on the aspects of obesity and weight reducing strategies like diet, physical activity and behavior modification through various source of information like booklets, classes and counseling as per the necessity **(Abdul Rahim, 2013)**
The researcher had developed and utilized the Interventional Module that depicts the strategies on low calorie diet, brisk walking exercise and behavior modification for the subjects

with obesity included in this study.

OBJECTIVES OF THE STUDY

1. To assess the BMI and WC among women with obesity before and after implementation of interventions
2. To find out the difference in posttest values of BMI and WC among women with obesity between control and experimental group
3. To find out the difference in pre and posttest values of BMI and WC among women with obesity in experimental group
4. To find out the influence of demographic variables among women with obesity on their BMI, WC in experimental group

RESEARCH HYPOTHESES

H_1: There is a significant difference between the posttest values of BMI and WC among women with obesity in control and experimental group.

H_2: There is a significant difference between the pre and posttest values of BMI and WC among women with obesity in experimental group.

H_3: There is a significant association between the posttest values of BMI, WC & the selected demographic variables among women with obesity in experimental group

MATERIALS AND METHODS

Research approach and design: Quantitative Evaluative Approach with Quasi- experimental research design where before- and- after with control group

Setting of the study: Selected urban areas of Salem Municipal Corporation, Tamilnadu

Population: All women aged 20 - 39 years with obesity residing in selected urban areas of Salem Municipal Corporation

Sample: The women aged 20 - 39 years with obesity from selected urban areas who met the inclusion criteria

A. Inclusion Criteria: The women with obesity who were
o having Body Mass Index > 25 to 39.9 Kg/m2
o willing to reduce their body weight
o between 20 to 39 years of age
o able to read and write Tamil

B. Exclusion Criteria: The women with obesity who were
o following any special diet prescribed by physician
o under obesity treatment with medicines or surgery
o pregnant, disabled or suffering from health diseases
o practicing any kind of exercises to reduce weight
o utilizing weight reducing equipments
o consuming weight reducing commercial products

Sampling Technique: Non probability purposive sampling technique with two-stage random sampling using lottery method

Sample size: 100 women with obesity for control and 100 for experimental group

Instruments used to collect data:
o **Section I:** Baseline data to collect demographic information (biographic variables, clinical variables and life style practice variables)

o **Section II:** Anthropometric Parameters (Measuring weight by weighing machine, height by height scale and Waist Circumference with inch tape)

Theoretical frame work Imogene King's Goal attainment theory

Description of the intervention
Interventional module to reduce weight contains concept of weight regulation, importance of weight reduction, obesity and associated health problems, fat distribution, assessment parameters, general instructions to modify the behavior, improving physical activity and 12 weeks of intervention with 1200 low Kilocalorie diet and brisk walk 30 minutes/day for 5 days/week.

Content validity The CVI score obtained for tool was >80 and Face validity from biomedical experts with calibration certificates for electronic weighing machine (125 kg capacity), height scale, non-stretchable measuring tape.

Reliability Test-retest method using Pearson's correlation co-efficient formula for weighing machine (r = 0.814), height scale (r = 0.952) measuring tape (r = 0.96) found to be reliable.

Pilot study finding was found to be significant and feasible

RESULTS
Section I: Comparison of posttest values of BMI and WC among women with

Obesity between control & experimental group

Table No. 4.1: Un paired 't' test to compare the posttest values of BMI and WC among women with obesity between control and experimental group (n=100)

Parameters	Post-test Values				Difference	t- value	P-value
	Control Group		Experimental Group				
	Mean	SD	Mean	SD			
BMI	32.56	3.46	28.44	2.89	4.12	9.12**	0.001***
WC	40.75	4.25	36.11	3.96	4.64	5.28**	0.001***

Table value: 1.96 (<0.05 *level) 2.576 (<0.01** level) 3.291 (<0.001*** level)

Unpaired 't' test revealed significant difference in posttest values of BMI and WC between control and experimental group. BMI (32.56±3.46 and 28.44±2.89) mean difference 4.12, t=9.12 > table value (3.291) at p < 0.001. WC (40.75±4.25 and 36.11±3.96) mean difference 4.64, t= 5.28 > table value (3.291) at p < 0.001.

Section II: Comparison of pre and posttest values of BMI and WC among women with obesity in experimental group.

Table No. 4.2: Paired 't' test to Compare the pre and posttest values of BMI and WC among women with obesity in experimental group(n = 100)

Parameters	Experimental group				Mean Difference	t- value	p-value
	Pretest		Post test				
	Mean	SD	Mean	SD			
BMI	32.09	3.26	28.44	2.89	3.65	40.78	<0.001***
WC	40.44	4.25	36.11	3.96	4.33	31.05	<0.001***

Table value: 1.96 (<0.05 *level) 2.576 (<0.01** level) 3.291 (<0.001*** level)

Paired 't' test revealed significant difference in mean pre and posttest values of BMI and WC in experimental group. BMI (32.09±3.26 and 28.44±2.89) mean difference 3.65, t=40.78 > table value 3.291 at P<0.001. WC (40.44±4.25 and 36.11±3.96) mean difference 4.33, t=31.05 > table value 3.291 at P<0.001.

Section III: Association between the posttest values of BMI & WC with the selected demographic variables among women with obesity in experimental group.

Table No. 4.3: Association between the posttest values of BMI & WC among women with obesity in experimental group with their selected demographic variables. (n = 100)

S. No	Demographic Variables	BMI		WC	
		χ^2	p-value	χ^2	p-value
• Biographic variables					
1	Age in years	5.79	0.760 NS	35.09	0.001***S
2	Educational status	6.81	0.658 NS	18.34	0.001***S
3	Religion	1.03	0.794 NS	2.031	0.317 NS
4	Marital status	9.61	0.383 NS	11.23	0.081 NS
5	Type of Family	3.53	0.316 NS	3.42	0.181 NS
6	Type of work	2.12	0.547 NS	2.84	0.242 NS
7	Family monthly income	7.67	0.568 NS	3.52	0.742 NS
• Clinical variables					
8	Distribution of fat	1.45	0.694 NS	2.38	0.304 NS
9	Family history of obesity	12.02	0.212 NS	4.12	0.661 NS
10	Reproductive health	8.19	0.514 NS	10.64	0.100 NS
11	Duration of sleep at night	45.78	0.001*** S	4.58	0.334 NS
• Life style practices					
12	Dietary pattern	1.007	0.799 NS	0.107	0.948
13	Social habits	9.28	0.026* S	0.396	0.820

NS - Not Significant S- Significant   *<0.01 highly significant *<0.05 Significant**

Chi square analysis between posttest values of BMI, WC found associated only with the duration of sleep at night (p<0.05) and social habits (p<0.001) with BMI, age in years and educational status (p<0.001) with WC.

DISCUSSION
The study findings discussed based on the objectives and the stated hypothesis was accepted. The pre and posttest BMI of women under obese category in control (68% and 77%) and experiment group (74% and 23%). WC under high risk category in control (91% and 97%) and experiment group (93% and 50%) was significantly decreased in experimental group with profound weight loss.

CONCLUSION
The interventions to reduce weight through Interventional Module with enormous information, instructions with guidelines promoted comfort and satisfaction for the women who felt happiness with their reduced body weight. It provoked their interest and readiness to maintain their body.

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