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Impact of Dietary Modification Strategy on the Quality of Life of Obese Adults Attending Aminu Kano Teaching Hospital, Kano, Nigeria

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Abstract

Obesity is defined as "an excessive deposit of Body Fat (BF) which may result in adverse metabolic consequences, may impair short and long term physical health. The aim of the study is to assess the impact dietary modification strategy on the quality of life of obese adults attending Aminu Kano Teaching Hospital, Kano. Quasi-experimental research designs were used in the current study. Stratified sampling technique was used in this study. The target populations were stratified based on demographic characteristic of gender into non-overlapping sub-populations or groups of males and females which formed the sampling frame of all the list of obese adult patients. Simple random sampling, were used to select the sample from the strata. Statistical Package for Social Sciences (SPSS) Version 20 was used to compute mean and standard deviation, percentages, chi square, t-test, F-test and ANOVA. The result shows that 40.40% within 30-40 years, follow by 41-50years which represent 36.70% for study group, also followed by 31.25% within 41-50years for control group. 62.5% were female for studied groups and 40.8% were males for control group. 81.25% of studied groups were married, 68.75% were professionals, 56.25% attended post-secondary education and 81.25% of studied groups were urban settlers. 37.1% of the studied groups belongs to Obese class III with 35.95±7.5. The results also shows 43.75% and 45.0% of both study group and control group had daily intake en high calorie diet. The means of weight of physical functioning is 36.3±4.8 after intervention. Based on the findings from the present study, quality of life had improved with physical role functioning of 40.6±25.0 before intervention and 33.8±10.3 after intervention. More so, weight of the obese patients before health education program for the first month was 91.88±18.1 and weight after intervention program were 89.27±16.6 indicating that dietary modifications improves quality of life.

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Introduction

Overweight and obesity present a growing health problem among Africans from all socioeconomic status. In Sub Saharan African, obesity is not only a consequence of over-nutrition but possibly from excessive consumption of unbalanced diet dominated by carbohydrates and saturated fats. Poor nutrition coupled with low levels of physical activity associated with urbanization as well as other factors has resulted in high rates of metabolic syndrome and other non-communicable diseases in the sub-continent [1].

The state of the body with respect to each nutrient and overall body weight and condition is a powerful factor in promoting health and preventing and treating diseases. Weight loss of 10% or more has been associated with adverse outcomes and prolonged hospitalization, and in lean, healthy people, weight loss of more than 35% has been associated with death. Nutritional status affects immune response and response to medical therapies [2].

Lifestyle modification including dietary weight loss or physical activity has been shown to improve Health Related Quality Of Life. Despite the numbers of studies reporting positive effects of lifestyle modification on Health Related Quality Of Life, limited studies have investigated possible mechanisms of change in Health Related Quality Of Life. Further, the optimal lifestyle prescription for improving Health Related Quality Of Life has not been established [3].

Increasing evidence suggests that the combination of diet and exercise may be superior to diet or exercise alone with respect to reducing weight, improving lipid profile and preventing type 2 diabetes. However, the few intervention studies that compared the effects of dietary weight loss and/or exercise interventions on Health Related Quality Of Life have shown mixed results. Among 76 patients with type 2 diabetes, diet+exercise and diet-only intervention groups significantly improved in a general quality of life measure [3].

The complex interactions between genetics, socioeconomic environment, physical environment, psychosocial environment and lifestyle that bring about the development of obesity have continued to be subject of scientific investigations till date. The interactions between these factors are exemplified by the simple observation that when individuals living in obesity-restricting environments migrate to the so-called obesogenic environments, the likelihood of weight gain increases but the extent of weight gain varies between the individuals according to genetic predisposition [4].

It is believed that its main role is to increase food intake when body weight is low. When fat stores are low, levels of leptin fall and hunger and food-seeking behaviour are stimulated. An increase in body fat, however, stimulates the secretion of leptin, which circulates in the bloodstream, crosses the blood–brain barrier and acts centrally to increase satiety. This in turn reduces the overarching drive to eat, leading to a period of negative energy balance, and reduction in the secretion of leptin from fat. In this way, the system returns to equilibrium. Any mutation of 'ob' gene leads to improper coding of leptin, which has been associated with obesity [2].

Dietary energy restriction has long been promoted as an important component of successful weight loss regimens, and there is compelling evidence from epidemiologic investigations and clinical trials supporting its use and is believed that if weight loss through dietary restriction results in reduction in energy expenditure, while physical activity increases energy expenditure, the combination of the two could potentially lead to reduction in body mass, without subsequent reduction in resting energy expenditure thus improving the ability to achieve long term weight loss [2].

The increased overweight prevalence within the general population may partly be due to an increased consumption of processed foods with a low intake of dietary fiber. Previous studies have shown a correlation between low dietary fiber intake and overweight. Ingestion of a certain amount of dietary fiber apart from alleviating constipation also reduces hunger, thereby reducing total energy intake and preventing weight gain. In line with this, previous interventions on weight reduction have shown a positive effect of increase in dietary fiber intake on weight loss [5].

A diet composed of 50–60% carbohydrates often will result in excessive weight gain and postprandial hyperglycemia. Therefore, it has been suggested that carbohydrate intake be limited to 33–40% of calories, with the remaining calories divided between protein (20%) and fat (40%) [6].

It has been shown consistently that obesity may impact important aspects of Health-Related Quality of Life (HRQOL), such as physical health, emotional well-being, and psychosocial functioning. Recently, researchers have become interested in using standardized assessment instruments to directly assess the effects of obesity on health-related quality of life [7].

Weight loss programs focused on restricting energy intake, but sharp reductions in energy intake have been shown to result in fat-free mass reductions and negatively impact metabolic rate. In addition, a growing body of evidence demonstrates that in comparison with a dietary restriction intervention alone, exercise, accompanied with or without weight loss, can lead to favorable changes in body composition including a reduction in abdominal adiposity [8].

According to American Diabetic Association (ADA) recommendations, carbohydrate intake should be approximately 40 % of total calorie intake and should be selected from foods with low glycaemic index values. However, those who are overweight (BMI of 25 to 29.9) should ingest approximately 25 kcal/kg body weight. Other guidelines recommend caloric intake based on BMI as follows: 30 kcal/kg for a BMI of 22–25, 24 kcal/kg for a BMI of 26-29, and 12-15 kcal/kg for a BMI of >30.

A high BMI is associated with higher blood pressure and risk of hypertension, higher total cholesterol, low density lipoprotein cholesterol and triglyceride levels and lower high density lipoprotein cholesterol levels. The overall risk of coronary heart disease and stroke, therefore, increases substantially with weight gain and obesity. Gall bladder disease and the incidence of clinically symptomatic gallstones are positively related to BMI [9].

What motivates and determines health-related behaviour is complex including past habits, beliefs, moral climate and translating intention into action, but in today's societies, there is a psychological conflict between what people want (e.g. fatty, sweet foods) and their desire to be healthy and/or slim. Knowledge about healthy food choices can be a predisposing factor for the adoption of a healthy diet but it is insufficient to motivate healthy eating [2].

Materials and Method

Research Design

Quasi experimental research designs were used in the current study. Hypothesis-testing research design that tests the hypotheses of causal relationships between variables under study. The study requires procedures that will not only reduce bias and increase reliability, but permit drawing inferences about causality. The rationale for the choice of this design was to compare two groups of obese adults for both intervention group and control group and find their difference

Target Population

The study population comprises of all patient who were obese attending Specialty and General out-patient department Clinics in Aminu Kano Teaching Hospital, Kano. The target population for this study is not finite as patients visit the Specialty clinics on weekly basis for medical attentions and appointments.

Sample size determination

The sample sizes were calculated using Sample Size for Comparison formula as follows; [11]. It is used to test the differences (d) between two sub-samples regarding a proportion and can assume an equal number of cases (n1 = n2 = n) in the two sub-samples, the formula is

Sample Size formula for comparison groups is given as $n = 2z^2pq|d^2$

Where n = sample size for the study

z = standard normal deviation (a constant) which is 1.96 at 95% confidence interval

P = Prevalence of obesity in Nigeria = 8.1% [12]

q= 1- p = 1 – 0.081

q= 0.919

d= 5% = 0.05

z= 1.96

$n= 2[1.96^2 \times 0.081 \times 0.919 | (0.05)^2]$

n =2 [3.8416 x 0.081 x 0.919|0.0025]

n = 2[114.386]

n = 229

Therefore, the sample sizes used were 240 with 5% attrition for overweight and obese adults, hence, 240 each for the two subgroups to be compared i.e intervention and control groups making a total sample size of 480.

Sampling Techniques

A total of 240 obese adult patients were recruited for the study using Stratified sampling technique. 240 samples each for intervention and control groups, making a total of 480 recruited obese adults. The sample frame comprises of the list of all obese patients attending clinics and were counted based on their sitting arrangement. Male obese patients had separate sitting arrangement from their female counterparts. The target populations were stratified based on demographic characteristic of gender into non-overlapping sub-populations or groups of males and females. Then using a simple random sampling, the samples were obtained. Random sampling were done using paper basket method where number are written on papers and folded to prevent the patients from knowing what number was written. These random numbers are written from 1 to 240 and squeeze, folded and put in a basket, asking every obese patients to pick a number randomly from the basket, whoever pick one first were attended to in a serial manner until all the numbers were exhausted.

Research Tools

Four (4) main tools were used for data collections. Three (3) tools 1, 2, and 4 were developed by the researcher following review of relevant literature while tool 3 was adapted from [13,14,10] on RAND-36 and SF-36 Health related Quality of Life Questionnaire.

(A)Tool (1) Education Session Plan/modules on Weight reduction Strategy (Health education on dietary modifications). It was structured in such a way that questions were formulated according to a standard format so that nurses and other allied health care professional were able to ask the same questions during a patients admission or pre-admission visit. This questionnaire serves to initiate the process of altering patients' unhealthy behaviours, promote wellness and improve quality of life. Examples of questions asked at the end of education session plan include what is the meaning of health, mental health, psychological and emotional well being? How is height and weight measured using height and weight measuring scales in comparing with the standard weight and height for an adult? What is the meaning is the meaning of overweight and obesity and how are they classified? What is the meaning of Body Mass Index (BMI) according to World Health Organization? What are the important of weight reduction and its overall effect on quality of life? etc

(B)Tool (2) Socio-demographic Characteristics Regarding Obese Adult Questionnaire. It is divided into four (4) main parts as follows;

i. Client Profile Characteristics. It comprises of age, sex, marital status, educational status, occupation and place of residence

ii. Physical Examination and Assessment Questionnaire. It consist of weight, height, body mass index, previous medical diagnosis, and family history of obesity and classifications of obesity according to pattern of presentations.

iii. Background Medical Conditions of Obese Adult Questionnaire. This section deals with the backgrounds health profiles and conditions of the patients including cardiovascular diseases, type II diabetes mellitus, dyslipidemia, sleep apnea, osteoarthritis cancers.

iv. Background Health Assessment Related to Dietary Modifications and General Well-being Questionnaire. It include history and pattern of eating habits, behavioural changes associated with excessive food intake, high calorie and cholesterol diets, physical activity and life style associated with dietary intake and frequent exposure to refined dietary products.

(C) Tool (3) the Obesity Adjustment Survey (OAS) and SF-36-RAND-36 Quality of Life Assessment Questionnaire. The tools were adapted from a study on quality of life and psychological well-being in obesity management [13]. The Obesity Adjustment Survey (OAS) is a brief questionnaire designed for use in primary and specialist care to focus specifically on an individual's level of distress over obesity. It consist of 20 items and

each items are scored on a 5-point Likert scale where 1 = not at all true, 2 = a little bit true, 3 = somewhat true, 4 = moderately true, 5 = extremely true. The SF-36 Health Related Quality of Life that focuses on life-style physical activity or a program of traditional aerobic activity for an obese or overweight adults and as a self-report measure of functional health and well-being, while RAND-36 Health Survey taps eight health concepts: physical functioning, bodily pain, role limitations due to physical health problems, role limitations due to personal or emotional problems, emotional well-being, social functioning, energy/fatigue, and general health perceptions. It also includes a single item that provides an indication of perceived change in health.

(D) Tool (4) Follow-up Assessment Sheet/Questionnaire. This is done to assess the impact of health education on dietary modification (weight reduction strategy) for obese adults. The intervention groups were given health education on dietary modifications for six (6) months and weights at both pre-and post interventions were recorded. The control groups were exposed to health educations on weight monitoring and it's important to health including measuring their individual weights at pre-intervention were also recorded.

Validity and reliability

A face and content validity method was used to ensure the validity of the research instrument; this was achieved through the judgment of the researcher's supervisor and two jurists to assess the clarity of statement and relevance of the content. The instrument is reliable with reliability coefficient of 0.729. Content validity index was also measured to ascertained its applicability and feasibility

The adapted tools were also modified following review of relevant literature to suit the study purpose and are presented for content and construct validity. Test-retest reliability was excellent, as indicated by the following intra-class correlation coefficients in each domain: symptoms: r = 0.93; activity/mobility: r = 0.90; personal hygiene/clothing: r = 0.85; emotions: r = 0.90; social interactions: r = 0.87; and sexual life: r = 0.84 (all p values < 0.01). Cronbach's alphas were as follows: symptoms (10 items): 0.84; activity/mobility (9 items): 0.93; personal hygiene/clothing (5 items): 0.78; emotions (11 items): 0.90; social interactions (7 items): 0.86; and sexual life (2 items): 0.65, indicating good internal consistency for all domains of the questionnaire [10].

Method of data Collection

Administrative approvals were obtained from the Aminu Kano Teaching Hospital Management to collect the data. Research assistants were also recruited from the department of nutrition and dietetics of Aminu Kano Teaching Hospital to assist in data collection especially on dietary module guidelines using work time table as follows. I initially gained entrance to the Specialty and GOPD Clinics along with the staff of the nutrition and dietetics department having recruited two of their staff as research assistant. I introduced myself to all the patients coming for the clinics and explain to them the purpose of the study. Having explained the relevance of the health education program on dietary modifications, we started recording the weight and height of the recruited participants to arrive at their body mass index from computing both the weight and height. Prior to these an introductions in the form of pre-lectures were done for the participants to arouse their interest for the study. This was done to also seek their consent even before giving them consent form to append their signature.

Once body mass index were computed, I began the health education program for the intervention groups for each contact, recording their body mass index, advising them on exercise and physical activities including lifestyle modifications. Weights are recorded for the period in which the data were collected. The intervention groups were given room for feedback concerning any clarifications regarding the health talk and I also contact them through their mobile phone for follw-up. They were asked to wait for a period of six months to record their weight and body mass index again for which were later compared with the body mass index of the control groups to see if there were changes or effect noticed.

Ethical considerations

Ethical approval was sought and obtained from human research ethic committee of the Aminu Kano Teaching Hospital along with the reference code stating the approval to conduct the study. The reference code is AKTH/MAC/SUB/12A/P-3/V1/1997

Informed written consent were obtained from the patient for voluntary participation in the study after explanation of the study purpose; patient were informed about the privacy of information, confidentiality of data and their right to withdraw at any time of the study. Human subject research guidelines were followed so as to protect participants from any harm or injury during the course of the study in line with Helsinki declaration, Belmont report and CIOMS 2012 declaration. Any participants who felt his right to privacy is being violated or not ready to give cooperation and consent were excluded from the study.

Statistical Analysis

The collected data were organized, tabulated and statistically analyzed using SPSS version 20. Continuous variables were also expressed as mean ± Standard Deviation of Mean (SDM), and categorical variables as percentages and chi square statistical distribution test. Analysis of variance (ANOVA) test/analysis was also done for this study. The statistical differences between the averages of continuous variables also determined with the Student's t-test or sample t-test distribution. For Chi-test which was used in this study were based on 95% confidence limit and 80% power of the study. Values of $p<0.05$ was considered significant.

Results

This tables shows that in terms of age 40.40% within 30-40years, follow by 41-50years which represent 36.70% for study group, whereas, 37.08% are within the age range of 30-40years, also followed by 31.25% within 41-50years for control group at $\chi^2 = 51.8$, $p = 0.026$. The mean and standard deviation of the age for both study group and control group are 44.7±9.2 and 47.8±8.5 respectively with $t = -4.11$ at $P = 0.000$. Also, in relation to gender distribution, more than half of the study group of obese adults were females (62.5%) and 59.2% for the control group. In terms of marital status, (81.25%) more than three-quarter of the study group of obese adults were married and 79.17% for the control group. 68.75% more than half of the studied obese adults were professional for both study and control group and 56.2% attended post secondary education. 81.25% of the studied obese adult, more than three-quarter resides in urban areas and 52.92% of control group are from rural areas.

Table 1: Distributions of both study group and control group of obese adults according to their socio-demographic characteristics (n = 480).

Socio-demographic characteristics	Study Group		Control Group		χ^2	P
	n	%	n	%		
Age (years)						
30 – 40	97	40.40	89	37.08	51.800	**0.026***
41 – 50	88	36.70	75	31.25		
51 – 60	48	20.00	53	22.08		
>60	7	2.90	23	9.58		
Mean±SD	44.7±9.2		47.8±8.5		t = -4.11	P = **0.000***
Gender						
Male	90	37.50	98	40.80	0.560	0.454
Female	150	62.50	142	59.20		
Marital Status						
Single	15	6.25	15	6.25	0.779	0.854
Married	195	81.25	190	79.17		
Divorced	15	6.25	20	8.33		
Widowed	15	6.25	15	6.25		
Occupation						
Non-skilled	30	12.50	31	12.92	0.028	0.986
Skilled	45	18.75	44	18.33		
Professional	165	68.75	165	68.75		
Educational Status						
No formal education	0	0.00	33	13.75	2.025	**0.000***
Primary School	60	25.00	104	43.33		
Secondary School	45	18.75	103	42.92		
Post- Secondary School	135	56.25	0	0.00		
Place of residence						
Rural	45	18.75	127	52.92	60924	**0.000***
Urban	195	81.25	113	47.08		

P<0.05

Table 2: Distribution of both study group and control group according to their classifications of body mass index (BMI) (n = 480).

Classifications of BMI (Kg/m²)	Study group		Control group		t	P
	n	%	n	%		
Overweight	13	5.4	10	4.2	0.422	0.673
Pre-obese	53	22.1	66	27.5		
Obese class I	39	16.3	32	13.3		
Obese class II	46	19.2	47	19.6		
Obese class III	89	37.1	85	35.4		
Mean ± SD	35.95 ± 7.5		35.66 ± 7.2			

P<0.05

Check list/Scales: BMI (25) signifies over weight, 25 – 29.9 (Pre-obese), 30 -34.9 (obese class I), 35 – 39.9 (obese class II), and 40 (obese class III) [15].

This table shows the distributions of study group and control group according to their body mass index with 5.4% of study group were overweight and for control group, 4.2% were also overweight. For obesity class III, the study group had 37.1% and control group had 35.4% with t = 0.422 at P = 0.673.

Table 3: Distributions of study group and control group according to their dietary modification strategy (n = 480).

Statements on dietary strategy	Study Group		Control Group		χ^2	p
	n	%	n	%		
High calorie dietary intake and consumption						
Daily intake	105	43.8	108	45.0	1.718	0.424
Intake with discretion	90	37.5	78	32.5		
Intake once in a while	45	18.8	54	22.5		
Behavioral changes with food intake						
Sedentary life style	30	12.5	114	47.5	73.07	**0.000***
Decreased exercise	150	62.5	78	32.5		
Increased physical activity	60	25.0	48	20.0		
Life Style associated with physical activity						
Sedentary	60	25.0	72	30.0	18.945	**0.000***
Less activity	135	56.3	90	37.5		
Aerobic exercise	45	18.8	78	32.5		

Weight monitoring and measurement						
Routine	87	36.3	93	38.8		
Regularly	65	27.1	71	29.6	2.207	0.531
Weekly	88	36.7	76	31.7		
Dietary knowledge and behavior of patient						
Adequate	90	37.5	111	46.3		
Inadequate	120	50.0	71	29.6	23.67	**0.000***
Not at all	30	12.5	58	24.2		
Dietary advice to lower sodium intake						
Non-adherence	118	49.2	144	60.0	5.681	**0.017***
Strict adherence	122	50.8	96	40.0		
High intake of fruits and vegetables in staple diet						
Often	90	37.5	90	37.5		
Daily	120	50.0	102	42.5	5.613	0.060
Absent	30	12.5	48	20.0		
Reductions in refined product dietary emphasize						
Low fat diet	79	32.92	102	42.5	24.357	**0.000***
Moderate fat diet	140	58.33	90	37.5		
Balanced low calorie diet	21	8.75	48	20.0		
Dietary fibre intake						
Always	60	25.0	84	35.0		
Sometimes	90	37.5	78	32.5	5.714	0.057
None	90	37.5	78	32.5		

This table shows distributions of dietary weight loss strategy with 43.75% and 45.0% of both study group and control group had daily intake on high calorie diet with $\chi^2 = 1.718$ at p = 0.424. Also, 56.25% and 37.5% of both study group and control group had less activity in terms of life style adoption with $\chi^2 = 18.945$ at p = 0.000.More so, half of the study group (50%) and 42.5% of control group had daily intake of fruits and vegetables in their staple diet with $\chi^2 = 5.613$ at p = 0.000; 58.33% more than half of the study group had moderate fat diet in their staple food with respect to reduction in refined dietary product, 42.5% of control group had low fat diet with $\chi^2 = 24.357$ at p = 0.000.

Table 4: Distributions of study groups according to their dietary modification before and after interventions (n = 480).

Statements on dietary strategy	Study group Before		Study group After		χ^2	p
	n	%	n	%		
High calorie dietary intake and consumption						
Daily intake	106	44.2	105	43.8	4.542	**0.005***
Calorie intake with discretion	84	35.0	90	37.5		
Intake once in a while	50	20.8	45	18.8		
Behavioral changes with food intake						
Sedentary life style	72	30.0	30	12.5	4.490	**0.000***
Decreased exercise	114	47.5	150	62.5		
Increased physical activity	54	22.5	60	25.0		
Life Style associated with physical activity						
Sedentary	66	27.5	60	25.0	4.426	**0.000***
Less activity	112	46.7	135	56.3		
Aerobic exercise	62	25.8	45	18.8		
Weight monitoring and measurement						
Routine	90	37.5	75	31.3	6.747	0.985
Regularly	68	28.3	60	25.0		
Weekly	82	34.2	105	43.8		
Dietary knowledge and behavior of patient						
Adequate	100	41.7	90	37.5	4.304	0.090
Inadequate	96	40.0	120	50.0		
Not at all	44	18.3	30	12.5		
Dietary advice to lower sodium intake						
Non-adherence	131	54.6	105	43.8	4.538	0.640
Strict adherence	109	45.4	135	56.3		
High intake of fruits and vegetables in staple diet						
Often	98	40.8	90	37.5		
Daily	111	46.3	120	50.0	4.514	0.733
Absent	39	16.3	30	12.5		

Reductions in refined product dietary emphasize						
Low fat diet	90	37.5	75	31.3		
Moderate fat diet	115	47.9	135	56.3	6.941	**0.000***
Balanced low calorie diet	35	14.6	30	12.5		
Dietary fibre intake						
Always	72	30.0	60	25.0	4.638	0.392
Sometimes	84	35.0	90	37.5		
None	84	35.0	90	37.5		

P<0.05

This table shows distributions of weight loss strategy to dietary intake before and after intervention; with regards to high calorie dietary intake and consumptions, 44.17% had daily intake before intervention and slightly drops to 43.75% after intervention with χ^2 = 4.542 at p = 0.005 which is statistically significant.

Furthermore, with regards to behavioural changes with food intake, 30% had sedentary life style after intake of food before intervention and decline to 12.5% after intervention with χ^2 =4.490 at p = 0.000. With regards to reduction in refined dietary product emphasis, 47.92% had moderate fat diet before intervention and rose to 56.25% after intervention with χ^2 =6.941 at p = 0.000.

Table 5: Comparing quality of life of obese adults between study group and control group before and after intervention (n = 480).

Quality of Life (QoL)	Before		After			
	Study group Mean ± SD	Control group Mean ± SD	Study group Mean ± SD	Control group Mean ± SD	F	P
Physical functioning	41.8 ± 14.2	44.0 ± 11.2	36.3 ± 4.8	44.0 ± 11.2	134.16	0.000*
Physical role functioning	40.6 ± 25.0	42.0 ± 23.2	33.8 ± 10.2	42.0 ± 23.2	204.43	0.000*
Bodily Pain	41.9 ± 26.1	40.5 ± 25.7	32.5 ± 12.9	40.5 ± 25.7	139.12	0.000*
General Health	49.0 ± 12.1	49.8 ± 12.3	42.3 ± 6.5	49.8 ± 12.3	124.10	0.000*
Mental Health	42.0 ± 13.1	42.0 ± 13.1	36.5 ± 12.3	42.0 ± 13.1	47.56	0.000*
Emotional role functioning	35.4 ± 20.1	35.4 ± 20.1	21.8 ± 6.9	35.4 ± 20.1	520.29	0.000*
Vitality	51.3 ± 21.1	51.3 ± 21.1	42.5 ± 20.5	51.3 ± 21.1	94.38	0.000*
Social functioning	49.9 ± 15.7	48.7 ± 21.6	56.4 ± 10.8	48.7 ± 21.6	6.98	0.000*

P<0.05

These tables compare quality of life of study group and control group of obese adult before and after intervention. For physical function, the mean weight before and after are 41.8 ± 14.2 and 36.3 ± 4.8; general health, the mean weight before and after are 49.0±12.1 and 42.3 ± 6.5; and for emotional functioning, the mean weight before and after intervention are 35.4 ± 20.1 and 21.8 ± 6.9

Conclusion

Based on the findings from the present study, it can be concluded that obesity is more common among higher group with female preponderance and with a link with rural-urban migration. Dietary modification strategy has a link with reduction. It can also be concluded that the intervention program had improved the QOL among study group and there is an observed cause and effect relationship between obesity and quality of life as behavior influences individual choices of decision towards maintaining optimal health at P<0.05 Behavioural response to dietary intake plays an essential role in weight loss seen among obese and overweight adults and are statistically significance at P<0.05 Furthermore, there is appreciable degree of weight loss which is clinically defined by the outcome of the intervention program study which ultimately translates to improvement in health related quality of life.

Recommendations

i. Effort should be intensified by health workers particularly the nurses in health educating their client on out-patient basis on healthy nutrition and general well-being of the body.

ii. There should be a policy or formal approval for mandatory routine medical check-up and weight monitoring.

iii. All institutions of nursing educations should incorporates dietary modules plan and weight monitoring guides in their field and rural community.

iv. There should be a policy to ban on importation of all those food items that have high cholesterol diet and a link with coronary artery diseases.

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