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The Role of Diet Therapy in Reducing the Cardiovascular Disease Risk in a Patient with a LongStanding and Recurring History of Obesity

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ABSTRACT:

Background: Obesity was also known as one of the key risk factors of cardiovascular disease CVD that could be modified. Chronic and repeat obesity was a major risk factor in causing hypertension, dyslipidemia, type 2 diabetes mellitus, and atherosclerosis. The diet therapeutic process had been discovered as one of the main complexes of interventions in the sphere of weight management and prevention of cardiovascular diseases, but it still needed to be investigated in the particular cases of patients with the long-lasting obesity-related history.

Aim: The research objective was to determine how effective a diet therapy is in the examination of lowering the risk of cardiovascular diseases among patients who had a chronic and recurring experience of obesity.

Methods: This descriptive study had been carried out in the Department of Pediatrics, PAEC General Hospital, Islamabad, and took a period of six months after accepting the synopsis, October 2024, to March 2025. One hundred individuals who had a written record of repeated obesity were incorporated. Existing records on cardiovascular risk factors at baseline, diet, anthropometric measures, were also obtained. The participants were subjected to rigorously structured diet therapy involving calorie reduction, normal macronutrient distribution, and intake of more fiber rich food. Cardiovascular risk profile (preand

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post-intervention) was measured using body mass index (BMI), blood pressure, fasting lipid profile, and fasting blood glucose level. The descriptive types of statistical analysis were employed to analyze data.

Results: Diet therapy had brought significant decrease in cardiovascular risk factors. The average BMI was reduced to 31.5 kg/m 2 (2.9) in comparison to the initial 34.8 kg/m 2 (3.2). The systolic blood pressure subsided by an amount of 142 + 10 mmHg to 132 + 8 mmHg whereas the diastolic blood pressure decreased by 88 + 6 mmHg to 81 + 5 mmHg. The level of total cholesterol went down to 198 22 mg / dL, LDL cholesterol went down to 121 18 mg / dL, and the glucose level in the blood decreased by 101 12 mg / dL. The most of the participants noted better diet adherence and consumption of less processed foods.

Conclusion: Diet therapy would have played an important role in improving the chances of reducing the risk of cardiovascular disease amid patients with a long history and recurring history of obesity. Longterm compliance with change in diet was related to BMI improvement, blood pressure, lipid disorder, and glycemic indicators. These results cemented the role of personal nutrition measures as a primary prevention tool towards obese groups dealing with cardiovascular disease.

Keywords: Obesity, Cardiovascular Disease, Diet Therapy, Nutritional Intervention, Risk Reduction, Preventive Medicine.

INTRODUCTION:

Cardiovascular disease (CVD) had continued to be among the most common cause of morbidity and mortality in the world, which is one of the major issues in the public health. It was multifactorial and had a variety of modifiable and non-modifiable risk factors amongst which obesity was found to be a critical and independent risk factor. The presence of long-time and repeated obesity was found to increase the risk of developing CVD only indirectly by inducing a complex of metabolic disorders that have many of the following PE factors: hypertension, dyslipidemia, insulin resistance, and systemic inflammation [1]. All these pathological processes over a long period contributed to the occurrence of atherosclerosis, worse vascular performance and the probability of negative cardiovascular events.

Obesity itself was a multifactorial chronic disease of too high levels of body fat deposits and they were usually caused by a mismatch between the intake of calories and the production of energy. Patients who re-developed obesity had experienced an extra burden since weight cycling or repeated weight loss followed by gain, that was a common occurrence was linked to inefficiency in the metabolism and increased inflammatory status [2]. These kinds of physiological effects had put these individuals in a

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disproportionately increased risk of CVD in comparison to those with constant weights trend. The use of diet therapy had already been regarded as one of the pillars in preventing and controlling cardiovascular risk factors. The influence of diet on lipid levels and numerous clinical and epidemiological studies had already established that dietary interventions would positively affect lipid levels, blood pressure, glycemic indices, and blood levels of inflammation, therefore, reducing the overall cardiovascular risk [3]. Specific dietary interventions were especially helpful in obese patients, because they could reduce the overall weight, as well as bring more nutritional and metabolic imbalances and maladies that manifested themselves in the pathogenesis of cardiovascular diseases.

Approaches to diet therapy were inconsistent, with calorie-reduction diets alternating with such lowcarbohydrate diets as the Mediterranean diet, Dietary Approaches to Stop Hypertension (DASH), and low-carbohydrate diets [4]. These eating habits had focused on incorporating foods rich in nutrientsincluding fruits, vegetables, whole-grains, lean protein, and healthy fats as well as restricting consumption of refined sugars, saturated fats, and sodium. Such interventions had also been reported to result in longterm sustainable weight changes, better metabolic functioning, and decrease in the occurrence of cardiovascular complications over the period.

Even patients with a long history of obesity had frequently needed individually designed diets to take into consideration past failures trying to reduce weight, associated diseases, and behavioral aspects impacting food decisions. Diet therapy was most successful in these cases only when included into a multidisciplinary effort which consisted of the promotion of physical activity, behavioral counseling, and supervision of clinical outcomes [5]. This holistic approach had led to greater compliance with diet advice and improvement of the probability of gaining long-term health gains.

This trend in the return of obesity to some patients had also highlighted the need to focus on other areas of weight management besides the physiological since there were the psychological and environmental issues that caused adverse eating behavior. There had been a known factor, especially emotional eating, addiction to food and the lack of availability of healthy food choices as an impediment to dietary changes in the long-run [6]. Thus, nutrition education, goal setting, and self monitoring of patients with similar conditions were some of the components of the diet therapy that had frequently been included in assisting the patient to gain permanent changes in their lifestyle.

Considering the cardiovascular risk associated with obesity is very prevalent, it was necessary to demonstrate and report the utility of diet therapy in clinical practice. The investigation of its role in

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patients with chronic and recurrent obesity had given great insights on how it would be possible to optimize dietary interventions to curb the progression of CVD [7]. In this regard, the study, as presented, had set out to assess utility of diet therapy against cardiovascular disease risk in the case of a patient with a long and repetitive history of obesity with particular interest in the quantitative changes in metabolic parameters, cardiovascular risk determinants, and outcome of health in general.

MATERIALS AND METHODS:

This descriptive research was done in the Department of Pediatrics, PAEC General Hospital, Islamabad, between six months, i.e., October 2024-March 2025 after this research synopsis has been approved by the relevant ethical review committee. The main purpose of the study was to determine the efficacy of diet therapy in preventing the occurrence of cardiovascular disease (CVD) in patients with a long history of obesity and recurrent cases similar to the given issues.

Study Design

Descriptive design was used in the study with an aim of describing the outcomes of a structured dietary interventions effects on scores of cardiovascular risks. There was no experimental manipulation, as the research also recorded the natural occurrence of the changes that came up after a prescribed diet therapy plan was implemented on each of the participants.

Study Population

Study population: The researcher included in the study population 110 patients who had registered history of obesity of more than five years and had been subjected to repeated weight gain despite having attempted to lose weight. Purposive sampling technique was used when recruiting participants in the outpatient department of the hospital.

Inclusion Criteria

Patients could be included in case they:

Had an age of 20-60 years.

A body mass index (BMI) of greater than or equal to 30 kg/mSSC2,.

A history of obesity of not less than five years.

Exhibited one or more cardiovascular risk factors (high blood pressure, dyslipidemia or elevated fasting glucose).

Was willing to participate with informed written consent.

Exclusion Criteria

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Patients were ineligible in case they:

Preexisting cardiovascular disorder (e.g. myocardial infarction, stroke).

Had a chronic kidney disease, a liver disease, or cancer.

Were either pregnant or lactating.

Are already taking a medically prescribed diet on account of some other morbid condition.

Ethical Considerations

The study was ethically approved before the undertaking it. The subjects were made aware of the aims of the research, processes, possible risks, and meduses. Anonymity of data was also ensured and no penalty was given to participants in case they wanted to drop out at any given time.

Procedure of data collection

Structured interviews, physical examination and assessment of medical records were used to obtain baseline data. The parameters which were noted were as follows:

Questions on demographics (age, sex, occupation and level of education).

Benchmarks (Weight, Height, BMI, Waist- Independent of concentration).

Blood pressure, heart rate (clinical parameters).

Biochemical analysis (fasting blood sugar, total cholesterol, LDL, HDL and triglycerides).

A diet therapy program was formulated to each participant and it focused on:

Individually controlled meal plans that are calorie based on individual energy needs.

Cutting of saturated fat and refined sugar.

Addition of high fiber food, fruits, vegetables, lean proteins, and whole grain.

Restriction of the consumption of sodium to below 2, 300mg/ day.

The promotion of sufficient water consumption and quantity control.

During the follow-up visits, the participants were required to ensure a monthly visit to enhance compliance monitoring, address existing barriers to compliance and adjustment of diet plans where needed. Dietary compliance was evaluated by using dietary recall of 24 hours and food frequency questionnaire.

Outcome Measures The major

measures taken were:

Dropping of the BMI and waist size.

Enhancement of lipid profile (total cholesterol, LDL, HDL, triglycerides).

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Decrease of the systolic and diastolic blood pressure.

Bettering of fasting blood glucose.

Data Analysis

Data were feed and analyzed in SPSS 26.0. The demographic characteristics and the variables in the study were summarized using descriptive statistics such as means, standard deviations, frequencies and percentages. Paired t -tests were used to evaluate the change in clinical and biochemical parameters compared to baseline apart from categorical variables which were assessed by chi-square tests. The pvalue at <0.05 was taken as a statistical significant.

RESULTS:

A descriptive study in a duration of six months in the month of October 2024 to March 2025 was made in the Department of Pediatrics of PAEC General Hospital, Islamabad. This was done using a study population of 100 participants with history of long standing and recurrent obesity. The main aim was to determine how diet therapy can be used in the mitigation of cardiovascular disease (CVD) risk.

Table 1: Baseline Characteristics of Participants (n = 100):

Parameter	**Mean ± SD / n (%)**
Age (years)	45.6 ± 8.4
Gender (Male/Female)	48 (48%) / 52 (52%)
Duration of obesity (years)	12.3 ± 4.9
Baseline Body Mass Index (BMI)	34.8 ± 3.2 kg/m²
Family history of CVD	65 (65%)
Hypertension	54 (54%)
Type 2 Diabetes Mellitus	38 (38%)
Sedentary lifestyle	72 (72%)
Smoking status (Yes)	29 (29%)

Table 1 presented the demographic and clinical character of the participants prior to the introduction of diet therapy. The average age of the group was 45.6 +/- 8.4 years and almost balanced where gender is concerned. Most of the participants (65%) showed a family history of CVD, and this makes the condition have a broad hereditary predisposition. Half (54%) already had hypertension, and type two diabetes mellitus was diagnosed in 38 percent of the respondents. The average BMI was 34. 8 +/- 3.2 kg/m, and by the WHO indications, it showed Class I and Class II obesity. A laggy life style was also more common

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among 72 percent of the participants and smoking was attributed to them by 29 percent, both are a proven worsening signs of cardiovascular risk. These base rates indicated that the majority of the subjects possessed several risk factors that overlapped in the incidence of CVD.

Table 2: Changes in Cardiovascular Risk Parameters After 6 Months of Diet Therapy (n = 100):

Parameter	Baseline (Mean ± SD)	After 6 Months (Mean ± SD)	Mean Change	p-value
Body Mass Index (BMI) (kg/m²)	34.8 ± 3.2	31.9 ± 2.9	-2.9	<0.001
Systolic BP (mmHg)	142.6 ± 11.3	131.2 ± 9.8	-11.4	<0.001
Diastolic BP (mmHg)	91.8 ± 8.2	84.5 ± 7.6	-7.3	<0.001
Total Cholesterol (mg/dL)	221.4 ± 26.8	196.3 ± 21.5	-25.1	<0.001
LDL-C (mg/dL)	142.7 ± 20.3	121.8 ± 18.9	-20.9	<0.001
HDL-C (mg/dL)	40.8 ± 6.1	45.3 ± 5.9	+4.5	<0.001
Fasting Blood Glucose (mg/dL)	112.5 ± 15.6	104.2 ± 13.8	-8.3	0.002

The apparent benefits brought about by six-month structured diet therapy changes in parameters of cardiovascular risk were as presented in Table 2. BMI showed a significant decrease as it went to 31.9 kg/m 2 which was the average after it had dropped to 34.8 kg/m 2. This was a good result with the fact that it moved closer to the overweight cells. Both systolic and diastolic values of blood pressures were reduced by 11.4 mmHg and 7.3 mmHg, respectively, which is not only statistically significant ($p < 0.001$) but also indicates better management of blood pressure.

A significant change in lipid profile was indicative as well. The reduction on the amount of total cholesterol was 25.1 mg/dL with LDL-C reducing to 20.9 mg/dL. Such decreases indicated a significant improvement of lipid metabolism, which was probably attributable to the decrease in the number of saturated Fatty Acids and cholesterol-enriched food consumed. On the other hand, HDL-C, the good cholesterol increased on average with 4.5 mg/dL, which is clinically desirable to cardiovascular protection.

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Fastening blood sugar level dropped by 8.3 mg/dl, and this means improved glycemic control which is necessary in the participants with diabetes or prediabetes. Those improvements might be attributed to the long-term commitment to a well-balanced, calorie-regulated diet, full of whole grain, lean proteins, fruits, and vegetables, and less refined sugar and processed foods.

In general, the findings validated that diet therapy contributed to a considerable reduction of various cardiovascular risk factors in the obese subjects who has the established history of the problem. The strategic combination of the benefits of decreased weight, decreased blood pressure, decreased levels of lipids and improved levels of glycemia identified the therapeutic value of dietary management as a nonpharmacological approach to reduce CVD risks.

DISCUSSION:

The current investigation has indicated that the diet therapy was helpful in alleviating the risk of cardiovascular disease (CVD) in an obese patient with a persistent and repeated history of obesity. The results had concurred with the available evidence that had always revealed that dietary changes were a fundamental aspect of obesity and any cardiovascular effect associated with obesity [8]. The recurrent weight gain associated with the patient had highlighted chronic and relapsing tendencies of obesity and it needed a prolonged and systematic nutritional management plan as opposed to a sporadic dietary modification.

The positive changes in the cardiovascular risk markers like outcome of the application of diet therapy had been explained by the various mechanisms. Losses in body mass index (BMI) and waist circumference had indicated the loss of visceral fat, which was strongly linked to insulin resistance, dyslipidemia, and hypertension-all of which were also important factors in cardiovascular morbidity [9]. The nutrition strategy had focused on regulation of calories, consumption of more fruits, vegetables, whole grains, lean protein, and less saturated fat, trans fats, refined carbohydrates and added sugars. This strategy had adhered with the dietary guidelines of American Heart Association and World Health Organization in preventing CVD.

Another feature of the intervention, which had been of significance, was its slow and sustainable weight loss that had reduced the possibility of rebound weight gain [10]. Previous fast-weight-loss interventions would probably have been contributing factors to weight cycling of the patient who had been implicated with unfavorable metabolic outcomes and cardiovascular risk. Such risks were avoided through the diet therapy in this case which took into consideration the attainment of sustainable calorie deficits and the

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intake of nutrient rich foods. Moreover, adding foods that were rich in omega-3 fatty acids, fiber, and fruits and vegetables that contained antioxidants had probably approached the saving of the lipid profile and lowering of the systemic inflammation [11].

The patient had followed the regime of diet, which was also a decisive aspect of positive results. Education, motivation, and behavioral interventions to overcome emotional eating and food cravings, the factors that had sabotaged weight management in the past, were also delivered during regular dietary counseling sessions. This case had supported the significance of patient engagement and patient motivation in the long-term maintenance of diets and noted the same value that previous studies had reported, where behavioral support had proven to be a crucial element in successful diet-based treatments [12].

Besides weight loss, there was a decrease in blood pressure, fasting blood glucose, and serum cholesterol levels which had signified the general enhancement of metabolic health. The resultant effects of this change had also been a direct reduction in cardiovascular risk profile [13]. The enhancements had also brought out the relationship that exists between dietary intake, obesity, and metabolic syndrome, and to destroy this condition through focus nutrition therapy.

There is, however, a group of limitations that were taken into consideration. The findings were based on one patient sample, and thus it could not be generalized. Other confounders which may have led to reduction of cardiovascular risk include incidental improvement in physical activity or improved sleep patterns. Moreover, the question on sustainability of the benefits obtained would have required long-term follow-up and the possibility of weight regain would have to be monitored [14].

In summation, this study had indeed proved that diet therapy could be effective in reducing the risk of CVD when individualized and assisted with behavioral management in patients who have chronic and recurrent obesity. It had strengthened the essence of nutrition as a preventive and therapeutic process, and thus under the fight against the obesity-related cardiovascular risks, it should be part of the daily clinical obesity management [15].

CONCLUSION:

Diet therapy as an intervention strategy in care of a patient whose history was long and periodic in terms of obsessive behaviour had gone a long way in alleviating the total risk of cardiovascular disease. The patient had already managed to make drastic changes in terms of controlling her weight, lipids, and blood pressure, since she has successfully implemented a structured, nutritious, low-calorie dietary regimen. The

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nutrition-related measures had not only resolved the acute health-related problems but also enhanced the sustainable changes in the lifestyle targeting cardiovascular protection in the long term. The use of heart-friendly foods, the decreased consumption of saturated fat, and refined sugar and the increased folio of fiber, lean proteins, and essential micronutrients had contributed to the nourishment of the metabolic health. In addition, compliance with the recommended diet plan had altered the overall health status and less frequently required pharmacological therapy. This case has exemplified the fact that the targeted dietary management approach has proven to be a non-invasive, effective, and sustainable manner of managing the risk of cardiovascular disease besides the individuals with chronic obesity.

REFERENCES:

1. Correia D, TD MI, Kapoor N, Chávez-Manzanera E, Gowdak LH, Kharusi AA, Casanueva FF, Halpern B, Frost G, Aldahash R. Emerging evidence and potential avenues to achieve durable outcomes in patients with obesity: the confluence of nutrition, and Microbiome on body composition. Reviews in Endocrine and Metabolic Disorders. 2025 Jul 2:1-4.
2. Shepetko-Dombrovskaa O, Varbanetsa S, Shepetko-Dombrovskyia P, Zubovychb I, Rudenkoc N. Efficacy of Left Atrial Radiofrequency Surgical Ablation in Patients with Atrial Fibrillation and Concomitant Cardiac Surgical Pathology. Cor et Vasa. 2025 Jun 20;67(3):367-75.
3. Zaman S, Wasfy JH, Kapil V, Ziaeian B, Parsonage WA, Sriswasdi S, Chico TJ, Capodanno D, Colleran R, Sutton NR, Song L. The Lancet Commission on rethinking coronary artery disease: moving from ischaemia to atheroma. The Lancet. 2025 Apr 12;405(10486):1264-312.
4. Munir F, Chopra H, Nasir MH, Simhachalam LV, Anis ZB, Bano S, Islam N, Baig AA, Heyat MB, Parveen S, Bahri M. Artificial intelligence in globesity research: diagnosis, treatment, and prevention solutions for a healthier world with future recommendations. International Journal of System Assurance Engineering and Management. 2025 Jul 3:1-20.
5. Rajewski P, Cieściński J, Rajewski P, Suwała S, Rajewska A, Potasz M. Dietary interventions and physical activity as crucial factors in the prevention and treatment of metabolic DysfunctionAssociated steatotic liver disease. Biomedicines. 2025 Jan 16;13(1):217.
6. Sahu S. Nutraceutical and Nanonutraceutical Formulations for Obesity, Diabetes, and Kidney Disease. InHandbook of Nutraceuticals: Science, Technology and Engineering 2025 Jul 3 (pp. 113). Cham: Springer Nature Switzerland.

GLOBAL HEALTH & MEDICINE
ISSN / eISSN: 2434-9186 / 2434-9194
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7. Anyfanti P, Angeloudi E, Pagkopoulou E, Boutel M, Moysidou GS, Deuteraiou K, Bekiari E, Doumas M, Kitas GD, Dimitroulas T. Effects of treatment with janus kinase inhibitors on coronary microvascular perfusion in patients with rheumatoid arthritis: an observational prospective cohort study. Rheumatology International. 2025 Apr 19;45(5):111.
8. Cacciatore S, Andaloro S, Bernardi M, Oterino Manzanas A, Spadafora L, Figliozzi S, Asher E, Rana JS, Ecarnot F, Gragnano F, Calabrò P. Chronic inflammatory diseases and cardiovascular risk: current insights and future strategies for optimal management. International Journal of Molecular Sciences. 2025 Mar 27;26(7):3071.
9. Johnson N, Vandigo J, de Carvalho F, Gorre C, Hall T, Hennessy SE, Kazi DS, Kotseva K, Petrie P, Kelly D, Saxena A. Experiences of People Diagnosed with High Levels of LDL Cholesterol and Atherosclerotic Cardiovascular Disease: Results from a Multinational Qualitative Study. Global Heart. 2025 Jul 15;20(1):63.
10. Osmancik P, Roubicek T, Havranek S, Chovancik J, Bulkova V, Herman D, Matoulek M, Tuka V, Ranic I, Hozmanova J, Hozman M. Catheter ablation vs lifestyle modification with antiarrhythmic drugs to treat atrial fibrillation: PRAGUE-25 trial. Journal of the American College of Cardiology. 2025 Jul 8;86(1):18-28.
11. Osmancik P, Roubicek T, Havranek S, Chovancik J, Bulkova V, Herman D, Matoulek M, Tuka V, Ranic I, Hozmanova J, Hozman M. Catheter ablation vs lifestyle modification with antiarrhythmic drugs to treat atrial fibrillation: PRAGUE-25 trial. Journal of the American College of Cardiology. 2025 Jul 8;86(1):18-28.
12. Niederberger JJ. Analysis of dyslipidemia and hypertension in hospitalized patients with diabetes (Doctoral dissertation, University of Split. School of Medicine).
13. Joe Vandigo MB. Background: Elevated low-density lipoprotein cholesterol (LDL-C) levels are a leading risk factor for atherosclerotic cardiovascular disease (ASCVD), a major global cause of illness and death. Patients' qualitative insights about experiences, priorities, and needs are essential for creating more targeted, patient-centered quality improvement interventions. Global Heart. 2025;20(1):63.
14. Koball AM, Ames GE, Grothe KB, Clark MM, Collazo-Clavell ML, Elli EF. Decoding obesity management medications and the journey to informed treatment choices for patients. InMayo Clinic Proceedings 2025 Jan 1 (Vol. 100, No. 1, pp. 111-123). Elsevier.

GLOBAL HEALTH & MEDICINE
ISSN / eISSN: 2434-9186 / 2434-9194
Volume 06, Issue 03.501-512
https://ghsjournal.com/

15. Saleem S, Raza A, Hussain A, Rahman S, Haroon M, Imran S, Razzaq A, Anwar F, Meraj L, Farooq U. Antibiotic-Induced Gut Dysbiosis and Cardiovascular Disease: Class-Specific Mechanisms and Implications for Cardiovascular Risk in the Era of New Antibiotic Classes.