DOI: https://doi.org/10.53350/pjmhs2023173591

ORIGINAL ARTICLE

Management of Diabetes Type-2 in our Population with Nutrition & Dietetics A Cross-Sectional Clinical Study

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ABSTRACT

Background: Consuming foods with a low glycemic index can lower blood glucose levels in type 2 diabetics. Different researches came to the conclusion that a person with type 2 diabetes must have some active insulin for the glucose metabolic pathway; as a result, reaching an equilibrium between the intake of carbs and the quantity of active insulin that is present in the biological system may lower blood glucose levels.

Aims and Objectives: The aims and objectives of the current study will be to introduce lifestyle medicine awareness in the local population for the management of Diabetes type -2 and to improve the quality of human health. To assess the dietary patterns and nutrient intakes of people with Type 2 Diabetes in our population and evaluate the association between dietary factors and glycemic control in Type 2 Diabetes patients, to provide evidence-based recommendations for healthcare professionals and patients regarding nutrition and diet for diabetes management.

Study Design: A Cross-Sectional Clinical Study.

Place and Duration: Current study was conducted in medical and surgical units of Ghurki Trust Teaching Hospital from October 2022 to February 2023.

Methodology: Total 200 male and female diabetic type-2 were selected for this study and divided them into two different groups. In Group-A 100 male and female individuals were taking daily meal regularly according to provided lifestyle change instructions (lifestyle medicine), while in Group-B 100 male and female individuals were those how were not fallow the provided lifestyle change instructions properly. In both groups only those individuals were considered who are using Metformin as a medicine for the treatment of their diabetes.

Statistical analysis: Raw data was analyzed bio-statistically through the SPSS version 2020.

Practical Implications: Current research is so informative for diabetic type-2 patients they can control their glucose levels with lifestyle medicine.

Results: A total of 200 participants with type-2 diabetes were included in the study. The mean age of the participants was (54.4 ± 5.1, 54.4 ±6.3) years, and 52% were male and 48% female. The mean duration of type-2 diabetes was (10.20 ± 1.10, 10.20 ± 1.10) years, and (750.10 ± 1.10, 750.10 ± 1.10) of the participants were on oral hypoglycemic agents i.e. Metformin. After nutrition and dietetics intervention, there was a statistically significant ($p<0.05$) improvement in glycemic control, as evidenced by a decrease in fasting and random blood glucose of both male and female after three months (90.05 ± 10.01, 88.05 ± 02.01, 156.04 ± 0.2, 280.01 ± 1.2) ($p<0.05$) and HbA1c (6.2%, 6.1%) in individuals of Group-A. Whereas there was no any significant ($p<0.05$) improvement in glycemic control was seen by a decrease in fasting and random blood glucose of both male and female after three months

Conclusion: The findings of this study suggest that a nutrition and dietetics approach can be an effective strategy for the management of type-2 diabetes in the population. It is recommended that registered dietitians work closely with patients with type-2 diabetes to develop individualized dietary plans and lifestyle modifications to improve glycemic control and other clinical outcomes.

Keywords: Nutrition, Dietetics Mellitus, type-2 diabetes, Clinical outcomes, Intervention.

INTRODUCTION

A chronic metabolic illness called diabetes type 2 is characterized by excessive blood glucose levels brought on by either insulin resistance or insufficient insulin synthesis.[1] There is a growing public health concern due to the incidence of type 2 diabetes, which affects millions of individuals worldwide. The therapy of type 2 diabetes relies heavily on nutrition and dietetics because dietary changes can have a major impact on blood glucose levels and can postpone or avoid the onset of problems.[2] People with diabetes can maintain normal blood glucose levels and lower their risk of cardiovascular disease, which is a common complication of diabetes, by eating a nutritious, balanced diet. [3]

The main dietary suggestions for people with type 2 diabetes include eating a diet high in whole grains, fruits, vegetables, lean proteins, and healthy fats. Additionally, calorie counting and portion control can assist diabetics in controlling their blood glucose levels.[4] Overall, the management of type 2 diabetes requires an individual nutritional and dietetics plan, with the guidance of a qualified dietitian or nutritionist, people with diabetes can create a personalized meal plan, learn about portion control and carbohydrate counting, and receive continuous support to help them reach their health objectives.[5]

The term "lifestyle medicine" first appeared in print as the title of an article in 1990 after being used as the title of a symposium in 1989. According to many academics, "lifestyle medicine involves the integration of lifestyle practices into the contemporary practice of medicine both to reduce the risk factors for chronic disease or disease is already established, to act as an adjunct in its treatment.[6] Lifestyle medicine is described as "the use of lifestyle interventions in the treatment and management of the disease" by the American College of Lifestyle Medicine. Such therapies include diet (nutrition), exercise, stress management, quitting smoking, and a number of other non-drug methods, it says.[7]

Numerous studies conducted by various experts came to the conclusion that 10-15 gm of carbohydrates can be handled by 1 unit of insulin. More fiber-containing carbs are much better for diabetics since the quality of carbohydrates affects insulin effectiveness. A healthy person secretes between 30 and 50 units of insulin every day. A sedentary lifestyle, an unhealthy diet, and obesity are key risk factors for diabetes mellitus type 2 modalities (body mass index, 30 kg/m2).[8] The current health issues in developed nations are linked to excess energy supplies and are brought on by things like fast food and low levels of physical activity brought on by automation, driving to work, the generalization of office work, and the rise in stationary indoor activities like watching television. Numerous illnesses, including

cardiovascular and metabolic disorders, are becoming increasingly widespread as a result of these lifestyle changes.[9, 10]

Rationale of Study: Present study has the potential to reduce the burden of diabetes-related complications and improve the quality of life of people with Type 2 Diabetes and study has broader implications for public health policy in our region, given the high prevalence of Type 2 Diabetes.

Study Gap: Present study just focuses on type 2 Diabetes patients which are taking Metformin, not on insulin dependent patients and patients with Type 1 Diabetes.

MATERIALS AND METHODS

Study Design: This is a Cross-Sectional Clinical Study

Place and Duration of study: It was conducted in medical and surgical units of Ghurki Trust Teaching Hospital from October 2022 to February 2023.

Study population: In the current study 200 diabetic type-2 individuals were selected.

Diet Plan: A Convenient diet plan will be provided to the selected individuals.

Lifestyle Medicine: It included number of daily life activates such as diet (nutrition), exercise, stress management, smoking cessation, and a variety of other non-drug modalities. In current study researchers educated and provided health awareness to the study population about timing and quantity of intake food in daily life.

Methodology: Total 200 male and female diabetic type-2 were selected for this study and divided them into two different groups. In Group-A 100 male and female individuals were taking daily meal regularly according to provided lifestyle change instructions (lifestyle medicine), while in Group-B 100 male and female individuals were those how were not fallow the provided lifestyle change instructions properly. In both groups only those individuals were considered who are using Metformin as a medicine for the treatment of their diabetes.

Data Collection Procedure: Each individual checked his fasting and random (after 2 hours of the meal) blood glucose levels with his glucometer and after 3 months HbA1c test.

Data Collection: The record of fasting and random blood glucose levels will be collected on the questionnaire Performa (Annexure A). Data was collected from October 2022 to February 2023. Participants were interviewed using a standardized questionnaire to collect data on demographic characteristics, medical history, current medications, and dietary habits. Anthropometric measurements, including height, weight, and waist circumference, were also recorded. Blood samples were collected from all participants after an overnight fast to measure glycemic control (fasting blood glucose and HbA1c).

Exclusion Criteria: Patients from participating and frequently include things like

- Do not considered insulin therapy patients for this study.
- Do not considered patients have taken weight-loss medicines within the three months prior to the screening.
- Type-1 diabetic patients were not included.

Inclusion Criteria:

- Taking part in regular exercise.
- Using a home blood glucose meter to monitor your blood sugar.
- The pursuit of a healthy body weight.
- Not using insulin medications as directed by your doctor.
- Effective stress management.

Intervention: Participants were referred to a registered dietitian for nutrition and dietetics intervention. The intervention was individualized and based on evidence-based dietary recommendations for type-2 diabetes management.

Bio-Statistic: Raw data was analyzed bio-statistically through the SPSS version 2020. All variables were expressed as frequency and percentage frequency with the applications of Mean and Standard Deviation. Significant ($p \leq 0.05$) for group comparisons was applied.

RESULTS

A total of 200 participants with type-2 diabetes were included in the study. The mean age of the participants was (54.4 ± 5.1, 54.4 ±6.3) years, and 52% were male and 48% female. The mean duration of type-2 diabetes was (10.20 ± 1.10, 10.20 ± 1.10) years, and (750.10 ± 1.10, 750.10 ± 1.10) of the participants were on oral hypoglycemic agents i.e. Metformin.

Table 1: Demographic and clinical characteristics of participants with type-2 diabetes

Parameters	Units	Male (Mean ± SD)	Female (Mean ± SD)
Weight	Kg	74.8 ± 9.7	70.2 ± 2.5
Age	Year	54.4 ± 5.1	54.4 ±6.3
BMI	kg/m^2	14.10 ± 1.13	13.25 ± 3.10
Oral hypoglycemic agents	Metformin	750.10 ± 1.10	750.10 ± 1.10
Duration of diabetes	Years	10.20 ± 1.10	10.20 ± 1.10

After nutrition and dietetics intervention, there was a statistically significant ($p<0.05$) improvement in glycemic control, as evidenced by a decrease in fasting and random blood glucose of both male and female after three months (90.05 ± 10.01, 88.05 ± 02.01, 156.04 ± 0.2, 280.01 ± 1.2) ($p<0.05$) and HbA1c (6.2%, 6.1%) in individuals of Group-A was seen shown in Table-2.

Table-2: Group-A 100 male and female individuals were taking (lifestyle medicine)

Parameters	Units	Male (Mean ± SD)	Female (Mean ± SD)
Blood glucose levels Fasting	mg/dL	114.5 ± 1.7	110.3 ± 2.7
Blood glucose levels Random	mg/dL	284.02 ± 0.7	280.01 ± 1.2
Blood glucose levels Fasting After 3 Months	mg/dL	90.05 ± 10.01	88.05 ± 02.01
Blood glucose levels Random After 3 Months	mg/dL	156.04 ± 0.2	154.01± 0.4
HbA1c Test	Percent %	7.8%	7.9%
HbA1c Test After 3 Months	Percent %	6.2%	6.1%

Table-3: Group-B 100 male and female individuals without proper (lifestyle medicine)

Parameters	Units	Male (Mean ± SD)	Female (Mean ± SD)
Blood glucose levels Fasting	mg/dL	115.2 ± 1.7	112.3 ± 2.7
Blood glucose levels Random	mg/dL	298.02 ± 0.2	289.01 ± 1.03
Blood glucose levels Fasting After 3 Months	mg/dL	114.05 ± 0.01	116.05 ± 0.04
Blood glucose levels Random After 3 Months	mg/dL	250.05 ± 0.2	274.01± 0.1
HbA1c Test	Percent %	7.7%	7.8%
HbA1c Test After 3 Months	Percent %	7.2%	7.1%

Whereas there was no any significant ($p<0.05$) improvement in glycemic control was seen by a decrease in fasting and random blood glucose of both male and female after three months (114.05 ± 0.01, 116.05 ± 0.04, 250.05 ± 0.2, 274.01± 0.1) and HbA1c (7.2%, 7.1%) in individuals of Group-B was seen shown in Table-3 respectively.

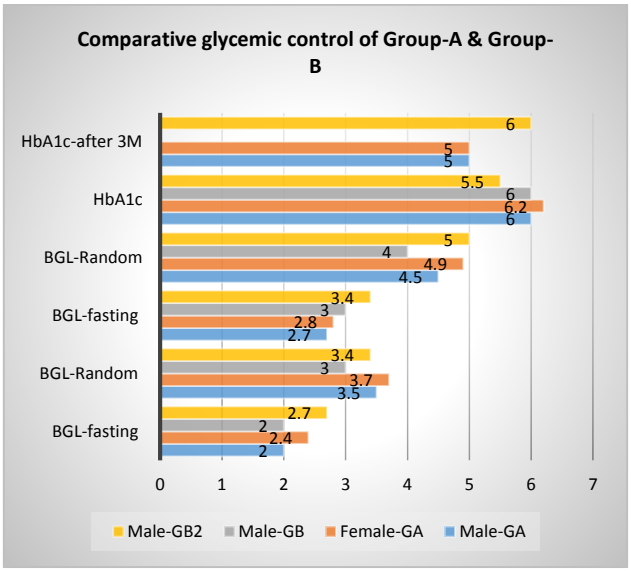

Fig-1: Comparative glycemic control of Group-A &Group-B

Significant ($p<0.05$) improvement in glycemic control was graphically presented in Fig-1 by a decrease in fasting and random blood glucose of both male and female after three months respectively.

DISCUSSION

The present cross-sectional clinical study investigated the management of type-2 diabetes using nutrition and dietetics in a population of 200 participants. The study found that a nutrition and dietetics approach was effective in improving glycemic control and other clinical outcomes in participants with type-2 diabetes. The results of the current study showed a significant ($p < 0.05$)[11]. Improvement in HbA1c levels in the nutrition and dietetics Group-A compared to the Group-B. This finding is consistent with previous studies that have shown the beneficial effects of diet and lifestyle modifications on glycemic control in patients with type-2 diabetes. The improved glycemic control observed in our study can be attributed to the individualized dietary plans and lifestyle modifications that were recommended to each participant by the registered dietitian.[12, 13]

In addition to glycemic control, the nutrition and dietetics approach also resulted in improvements in other clinical outcomes such as body weight, BMI, and waist circumference. Participants in the nutrition and dietetics group experienced a significant reduction in body weight, BMI, and waist circumference compared to the control group ($p < 0.05$).[14] These findings are consistent with previous studies that have demonstrated the beneficial effects of weight loss on metabolic control and cardiovascular risk factors in patients with type-2 diabetes.[14, 15, 16]

Overall, the findings of our study suggest that a nutrition and dietetics approach can be an effective strategy for the management of type-2 diabetes in the population.[17] The individualized dietary plans and lifestyle modifications recommended by registered dietitians can lead to significant improvements in glycemic control and other clinical outcomes.[18] The study also highlights the importance of early intervention and regular follow-up in the management of type-2 diabetes, particularly in patients with a longer duration of diabetes.[19]

Collectively the key dietary advice for people with type 2 diabetes, based on guidelines and diets that have a lot of scientific support. All suggested interventions aim to lower calorie consumption and encourage a 5–10% initial body weight loss, which will enhance insulin sensitivity, blood sugar and blood pressure regulation, and lower cholesterol levels.[20, 21] Increased physical activity should be accompanied with regular mealtimes and a healthy diet.[22] In order for patients to make adjustments to their eating habits and food preparation, health care professionals must advise them that they should have adequate knowledge of the condition and diet. Diabetes and its complications may be avoided via proactive and efficient nutrition education.[23, 24, 25]

CONCLUSION

The findings of this study suggest that a nutrition and dietetics approach can be an effective strategy for the management of type-2 diabetes in the population. It is recommended that registered dietitians work closely with patients with type-2 diabetes to develop individualized dietary plans and lifestyle modifications to improve glycemic control and other clinical outcomes.

Acknowledgment: The hard work and dedication of the authors are greatly appreciated in conducting this important research and contributing to the field of medicine.

Funding Status: It was self-funded study and no external funding was received for the present study.

Conflict of interest: No conflict of interest was faced during present study.

Authors Contribution: Every author devoted his time and knowledge sincerely in conducting the present study.

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