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Original Article

Comparison of Diabetic Control in Diabetic Patients, with and without Nutritionist Consultation

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ABSTRACT

***Objectives*:** To compare diabetic control in diabetic patients who undergo nutritionist consultation to those who do not have nutritionist consultation.

***Study Design*:** Quasi-experimental study.

***Place and Duration of Study*:** Pak Emirates Military Hospital, Rawalpindi Pakistan, from Jun to Dec 2022.

***Methodology*:** A total of 42 patients (21 in the Group that had a nutritionist consultation and 21 in the Group that did not have a nutritionist consultation) fulfilling the inclusion criteria were included in the study. At the time of inclusion, baseline HbA1C% was documented for all the patients in both groups. After that, all the patients in Group-A had a nutritionist consultation, while patients in Group-B had dietary counseling from their attending physician. At a three-month follow-up visit, HbA1C% was again checked to assess for diabetic control.

***Results*:** Mean age was 37.52±5.49 years. There were 27(64.30%) male participants and 15(35.70%) female participants. Median BMI was 34.00(37.00–28.00) kg/m2. Median duration of diabetes was 10.00(17.00–7.00) years. Mean baseline HbA1C% was 7.65±0.53%. The mean post-intervention HbA1C% in Group A was 6.37±0.27%, while in Group B, it was 7.10±0.29% (p<0.001).

***Conclusion*:** Nutritionists play a vital role in achieving better and optimal diabetic control in patients who have diabetes.

Keywords: Diabetes, Diabetic Control, HbA1C%, Nutritionist Consultation.

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INTRODUCTION

Type II Diabetes is a disease of the endocrine system that affects more than 463 million (6.01%) people worldwide.[1] In Pakistan, a study published in 2019, 10.6 – 19.1% of the population is affected by type II diabetes with 15.8% prevalence in women and 14.8% in men.[2] In Pakistan, multiple factors are resulting in increasing prevalence of this disease, including rapid urbanization, poor eating habits, and adverse food hygiene practices.[3,4] The etiology of type 2 diabetes is very complicated, multifactorial, and depends upon multiple physiological and genetic factors. Physiological factors involved in the etiology of type 2 diabetes include a high-fat diet, obesity (BMI of ≥30kg/m2), and a sedentary lifestyle. Amongst genetic factors involved in the etiology of type 2 diabetes, major contributors include a family history of diabetes, dysregulation of fatty acid metabolism secondary to an inherited defect in mitochondrial function associated with HLA/MHC, monozygotic twins, and ethnicity.[5-7]

Numerous pharmacological strategies that target insulin resistance or beta-cell activity have demonstrated their effectiveness in treating diabetes. However, it has been demonstrated that a lifestyle intervention combining a good diet and frequent exercise can significantly impact. To this end, the therapeutic nutrition component was established to guide an evidence-based strategy in managing diabetes through a nutritionist-recommended diet, but putting it into practice is still difficult.[8] While the vast majority of diabetic guidelines recommend beginning medication only after first making modifications to diet and level of physical activity,[9] this does not always end up being the case worldwide. Advice on diet for diabetes is typically only provided, at best, in the form of a printed menu in many different locations, except for specialized diabetes centers, where expert nutritionists and educators are available.

Because of the high number of diabetic outpatients and the shortage of medical professionals with the appropriate training, most hospitals in our country, either private or public, do not provide diabetes patients with the necessary consultation of a specialist nutritionist. Patients receive diet education booklets in some settings, and these leaflets provide information on how to eat appropriately while managing diabetes. In the same vein, the failure of general practitioners to refer diabetic patients to nutritionists who specialize in diabetes care is a

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significant factor contributing to the widespread absence of nutritionist consultation among diabetic patients in our nation.[10] For this purpose, the present study aims to determine the role and importance of nutritionist consultation for diabetic patients to control their diabetes better.

METHODOLOGY

The Quasi-experimental study was conducted at the Family Medicine Department of Pak Emirates Military Hospital, Rawalpindi Pakistan, from June 2022 to December 2022 after obtaining approval from the ethical review board of "Pak Emirates Military Hospital Rawalpindi, Pakistan." The sample size of 42 [21 in Group A (who had a nutritionist consultation) and 21 in Group B (who did not have a nutritionist consultation)] was calculated using the WHO sample size calculator by assuming the level of significance of 5%, power 95%, anticipated mean HbA1C% in nutritionist consultation Group 6.8±1.1 and anticipated mean HbA1C% in no nutritionist consultation Group 8.7±1.7 using the following formula:[11]

$$n = \frac{2\sigma^2 (z_{1-\alpha/2} + z_{1-\beta})^2}{(\mu_1 - \mu_2)^2}$$

Inclusion Criteria: Patients aged between 25 and 65 years, who were either male or female, and who had a diagnosis of diabetes (based on HbA1C% value of ≥6.5%)[12] for at least five years were included.

Exclusion Criteria: Patients who had pre-diabetes, had complications of diabetes (like neuropathy, nephropathy, and retinopathy), who were already using insulin for controlling their blood sugar, and those who were on a special type of diet (like solely carnivorous or vegetarian diet) were excluded.

The study population was selected by using a non-probability consecutive sampling method from the patients presenting at the chronic disease management clinic of our department. Written consent, which the study participants signed, was an essential prerequisite. Once a study pool of 42 patients was selected, we randomly divided them into two equal Groups based on their medical registration number. In Group A, we included patients who had a consultation from a specialist nutritionist and were provided with an individualized dietary plan, while in Group B, we included patients who got their dietary consultation from their attending physician either through a printed pamphlet or by verbal communication (Figure).

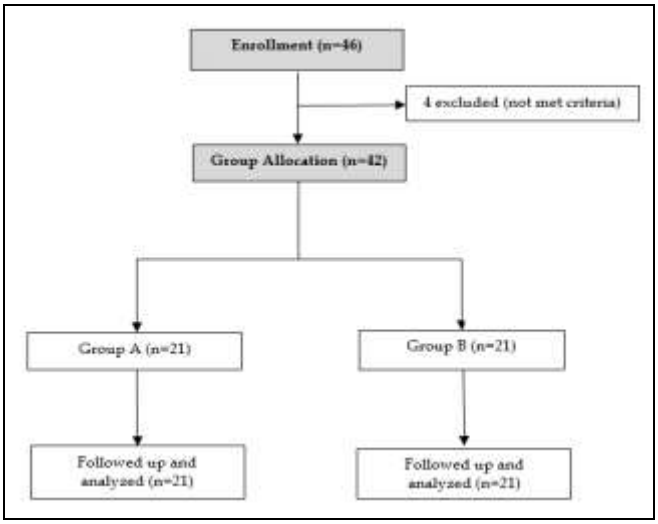

Figure: Study Participants Flowchart

Baseline characteristics of all the included study participants, including age, gender, body mass index (BMI), duration of diabetes, and HbA1C%, were documented. To monitor the effect on diabetes control, we used HbA1C% as the investigation of choice, which has been recommended by "The American Diabetes Association (ADA)".[13,14] For assessing the control of diabetes, after documenting all the baseline characteristics, particularly the HbA1C%, we devised a three-month follow-up plan with the patients in which, during the three months, patients were contacted through telephone as well as physically at the chronic disease management clinic to ensure their adherence to either nutritionist recommended individualized diet plan or the physician's dietary guidance. Patients were also encouraged to maintain compliance with their treatment plan and exercise regularly for thirty minutes. At the end of three months, patients were assessed physically at the chronic disease management clinic, and a repeat sample of HbA1C% was obtained to assess the change from the baseline and diabetic control.

Data was analyzed using Statistical Package for Social Sciences (SPSS) 22.00. The normality of data was checked by the Shapiro-Wilk test. Age and HbA1c were normally distributed and represented using mean ± standard deviation. At the same time, BMI and diabetes duration were found not to be normally distributed and were represented using the median interquartile range (IQR) and compared by the Whitney U test. Qualitative variables were represented using frequency and percentage and compared using a chi-square test. To compare mean HbA1C% levels

between groups by independent sample t-test. The *p*-value of ≤0.05 was taken as significant.

RESULTS

A total of 42 [21 in Group A (who had a nutritionist consultation) and 21 in Group B (who did not have a nutritionist consultation)] were included, as shown in Figure. The mean age of the study population was 37.52±5.49 years. There were 27(64.30%) male participants while the remaining 15(35.70%) were female. Mean baseline HbA1C% was 7.65±0.53%. These baseline characteristics are summarized in Table-I.

Table-I: Baseline Characteristics (n=42)

Characteristics	Mean±SD; n(%); Median IQR)
Mean age	37.52±5.49 years
Gender	
Male	27(64.30%)
Female	15(35.70%)
Median BMI	34.00(37.00–28.00) kg/m2
Median duration of diabetes	10.00(17.00–7.00) years
Mean HbA1C%	7.65±0.53%

The mean age in Group A was 36.95±4.93 years, while in Group B, it was 38.09±6.06 years (*p*=0.507). In Group A (n=21), the frequency of male patients was 16(76.19%) and of female patients was 5(23.81%), while in Group B (n=21), 11(52.38%) were male patients while 10(47.62%) were female patients, (*p*=0.107). The median BMI of patients belonging to Group A was 34.00(37.00–29.00) kg/m2, while of patients in Group B, it was 34.00(37.00–28.00) kg/m2, (*p*=0.980). The median duration of diabetes in Group A was 10.00(16.00–7.00) years, while in Group B, it was 10.00(17.00–7.00) years (*p*=0.428). The mean baseline HbA1C% in Group A was 7.53±0.50%, while in Group B it was 7.79±0.54% (*p*=0.110). This comparison of baseline characteristics between the two Groups is exhibited in Table-II.

Table-II: Comparison of Baseline Characteristics between Groups (n=42)

Characteristics	Nutritionist Consultation Group (n=21)	No nutritionist consultation Group (n=21)	*p*-value
Age (years)	36.95±4.93	38.09±6.06	0.507
Gender			
Male	16(76.19%)	11(52.38%)	0.107
Female	5(23.81%)	10(47.62%)	
BMI (kg/m2)	34.00(37.00–29.00)	34.00(37.00–28.00)	0.980
Duration of diabetes (years)	10.00(16.00–7.00)	10.00(17.00–7.00)	0.428
HbA1C%	7.53±0.50	7.79±0.54	0.110

At a three-month follow-up visit, the mean HbA1C% in Group A was 6.37±0.27; in Group B, it was 7.10±0.29 (*p*<0.001). This finding is shown in Table-III.

Table-III: Comparison of Post-intervention HbA1C% Between Groups (n=42)

Post-intervention HbA1C%	Nutritionist consultation Group (n=21)	No nutritionist consultation Group (n=21)	*p*-value
	6.37 ± 0.27%	7.10 ± 0.29%	<0.001

DISCUSSION

This study was conducted to compare diabetic control in diabetic patients who undergo nutritionist consultation to those who do not. It was found that the frequency of diabetes was higher in the male participants of the present study. This was also observed in a study conducted by multiple studies,[15, 16] and the reason for the higher prevalence of diabetes in men stems from high quantities of visceral fat in men. In the present study, it was also observed that the mean BMI of diabetics was also in higher ranges, which can be due to a strong association of having a higher body mass index with an increased propensity to develop diabetes.[17,18]

It was found in the current study that when it comes to baseline characteristics, no statistical difference was observed between study Groups, which indicates a lack of bias and homogeneity of data. However, when the HbA1C% values were compared between the patients who obtained individualized dietary plans through nutritionist consultation as compared to those who had their dietary advice from the attending physician, it was found that patients who had nutritionist consultation had far better control of their diabetes at follow up as compared to those who did not have a nutritionist consultation. This finding was congruent with what was observed in a study conducted by Matpady *et al.*,[11] which also reported a statistically significant difference between these two Groups of diabetic patients regarding post-intervention HbA1C%. Similar findings were observed by Mottalib *et al.*,[19] who reported that there was a significant effect of implementing a specialist nutritionist-advised diet plan to achieve optimal diabetes control. Furthermore, they also reported that diabetic control was better with a nutritionist consultation as compared to without a nutritionist consultation. Similarly, Deshmane *et al.*,[20] also reported the importance of adherence to a diet prescribed by a specialist nutritionist to achieve

optimal control of blood sugar levels and HbA1C% in diabetic patients.

Evident from the results of previous studies as well as what was found in the present study, specialist nutritionist consultation plays a pivotal role in the management of patients who have diabetes to achieve reasonable control of their disease and prevent the potential complications that patients can develop secondary to poor control of their diabetes. For this purpose, it is recommended that all the patients who have diabetes and are obtaining pharmacological intervention should also be referred to a specialist nutritionist to cover another important aspect of managing diabetes, i.e., the patient's diet.

CONCLUSION

Nutritionists play a vital role in achieving better and optimal diabetic control in patients who have diabetes. Therefore, it should be the priority of all physicians providing pharmacological intervention to patients with diabetes that they have a nutritionist consultation to obtain an individualized diet plan for improved control of diabetes.

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Authors' Contribution

Following authors have made substantial contributions to the manuscript as under:

AK & SN: Study design, data interpretation, drafting the manuscript, critical review, approval of the final version to be published.

NN & MH: Conception, data analysis, drafting the manuscript, approval of the final version to be published.

RL: Data acquisition, critical review, approval of the final version to be published.

Authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

REFERENCES

1. IDF-Diabetes Atlas 9th Edition. B-1160 Brussels, Belgium; 2020.
2. Akhtar S, Nasir JA, Abbas T, Sarwar A. Diabetes in Pakistan: A systematic review and meta-analysis. Pak J Med Sci 2019; 35(4): 1173-1178. https://doi.org/10.12669/pjms.35.4.194
3. Daryabor G, Atashzar MR, Kabelitz D, Meri S, Kalantar K. The effects of type 2 diabetes mellitus on organ metabolism and the immune system. Front Immunol 2020; 11: 1582. https://doi.org/10.3389/fimmu.2020.01582
4. Yamazaki D, Hitomi H, Nishiyama A. Hypertension with diabetes mellitus complications. Hypertens Res 2018; 41(3): 147-156. https://doi.org/10.1038/s41440-017-0008-y
5. Galicia-Garcia U, Benito-Vicente A, Jebari S, Larrea-Sebal A, Siddiqi H, Uribe KB, et al. Pathophysiology of type 2 diabetes mellitus. Int J Mol Sci 2020; 21(17): 6275. https://doi.org/10.3390/ijms21176275
6. Aras M, Tchang BG, Pape J. Obesity and Diabetes. Nurs Clin North Am 2021; 56(4): 527-541. https://doi.org/10.1016/j.cnur.2021.07.008
7. Rajaei E, Jalali MT, Shahrabi S, Asnafi AA, Pezeshki SMS. HLAs in autoimmune diseases: Dependable diagnostic biomarkers? Curr Rheumatol Rev 2019; 15(4): 269-276. https://doi.org/10.2174/1573397115666190115143226
8. Vlaar EMA, Nierkens V, Nicolaou M, Middelkoop BJC, Busschers WB, Stronks K, et al. Effectiveness of a targeted lifestyle intervention in primary care on diet and physical activity among South Asians at risk for diabetes: 2-year results of a randomised controlled trial in the Netherlands. BMJ Open 2017; 7(6): e012221. https://doi.org/10.1136/bmjopen-2016-012221
9. Evert AB, Dennison M, Gardner CD, Garvey WT, Lau KHK, MacLeod J, et al. Nutrition therapy for adults with diabetes or prediabetes: A consensus report. Diabetes Care 2019; 42(5): 731-754. https://doi.org/10.2337/dci19-0014
10. Siopis G, Colagiuri S, Allman-Farinelli M. Dietitians' experiences and perspectives regarding access to and delivery of dietetic services for people with type 2 diabetes mellitus. Heliyon 2020; 6(2): e03344. https://doi.org/10.1016/j.heliyon.2020.e03344
11. Matpady P, Mayya GA, Mogan P, Shetty JK, Umakanth S. Effect of dietician consultation on glycaemic control: A cross-sectional survey from the western coast of India. Manipal J Nurs Health Sci 2021; 7(2): 34-39.
12. American Diabetes Association Professional Practice Committee. Diagnosis and classification of diabetes: standards of care in diabetes-2024. Diabetes Care 2024; 47(Suppl-1): S20-S42. https://doi.org/10.2337/dc24-S002
13. American Diabetes Association Professional Practice Committee. Classification and diagnosis of diabetes: Standards of medical care in diabetes-2022. Diabetes Care 2022; 45(Suppl-1): S17-S38. https://doi.org/10.2337/dc22-S002
14. American Diabetes Association Professional Practice Committee. 6. Glycemic targets: Standards of medical care in diabetes-2022. Diabetes Care 2022; 45(Suppl-1): S83-S96. https://doi.org/10.2337/dc22-S006
15. Kautzky-Willer A, Leutner M, Harreiter J. Sex differences in type 2 diabetes. Diabetologia 2023; 66(6): 1165. https://doi.org/10.1007/s00125-023-05913-8
16. Nordström A, Hadrévi J, Olsson T, Franks PW, Nordström P. Higher prevalence of type 2 diabetes in men than in women is associated with differences in visceral fat mass. J Clin Endocrinol Metab 2016; 101(10): 3740-3746. https://doi.org/10.1210/jc.2016-1915
17. Karin A, Jon E, Martin A, Lena B, Martin L, Naveed S, et al. Body mass index in adolescence, risk of type 2 diabetes and associated complications: A nationwide cohort study of men. EClinicalMed 2022; 46: 101356. https://doi.org/10.1016/j.eclinm.2022.101356
18. Gupta S, Bansal S. Does a rise in BMI cause an increased risk of diabetes?: Evidence from India. PLoS One 2020; 15(4): e0229716. https://doi.org/10.1371/journal.pone.0229716
19. Mottalib A, Salsberg V, Mohd-Yusof BN, Mohamed W, Carolan P, Pober DM, et al. Effects of nutrition therapy on HbA1c and cardiovascular disease risk factors in overweight and obese patients with type 2 diabetes. Nutr J 2018; 14: 42. https://doi.org/10.1186/s12937-018-0351-0
20. Deshmane AR, Muley SA. Adherence and barriers to medical nutrition therapy and the effect on glycemic control among individuals with type 2 diabetes in India. Curr Res Nutr Food Sci J 2022; 10(3): 1020-1029. https://doi.org/10.12944/CRNFSJ.10.3.18