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Assessment of Activities of Daily Living in Type II Diabetic and Normal Subjects

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ABSTRACT

Diabetes is a chronic disease that affects multiple systems in the body and can reduce physical ability. This study aimed to assess the restrictions in activities of daily living among individuals with type II diabetes compared to those without diabetes. This cross-sectional comparative study enrolled participants with and without diabetes who met the specified inclusion and exclusion criteria. The participants provided informed consent, after which demographic variables were recorded for both groups. Activities of daily living were assessed using the DASH questionnaire. Data analysis was performed using the SPSS 23.0 software.

Results: The experimental group had a mean DASH score of 44.6 ± 8.29, whereas the control group had a mean of 14.03 ± 4.02. The t-test revealed a significant difference ($p < 0.05$) in the DASH scores between the two groups.

Conclusion: These findings indicate that individuals with diabetes experience greater restrictions in activities of daily living and a lower quality of life than non-diabetic individuals.

Introduction

Diabetes is a chronic disease that affects many systems in the body and can reduce a person's physical health and quality of life. An increasingly important consequence of diabetes is the development of physical limitations [1,2] and it is useful to consider the hand conditions related with diabetes within the context of these broad influences [3,4]. A wide range of deformities diabetes complications, and comorbidities have been associated with physical decline and disability and their effects may be cumulative. These include muscle weakness and physical inactivity, the presence and severity of neuropathy, peripheral vascular disease, coronary heart disease, visual impairment, depression, and obesity [5-7]. Older adults and those with long-standing diabetes are more likely to have disabilities, partly attributed to the late hazards of diabetes [8,9]. Women may be influenced more frequently and more severely by physical limitations [10], and obesity may have a greater negative impact on women's health. Obesity was co-related with greater hazards in mobility and strength in women compared to men, resulting in more difficulties with their activities, including those needing pushing and lifting [11]. Many epidemiological reports have published data on the prevalence of disability due to diabetes; however, activities of daily living have not been assessed in patients with Diabetes mellitus type II. This study focused on comparing the impacts of diabetes mellitus type II on activities of daily living with a control group of the same age as per the inclusion criteria [12,13]. Moreover, Obesity (OB) and type II diabetes are among the most prevalent metabolic diseases. They presently affect a considerable part of the world population and are characterized by several systemic co-morbidities, including cardiovascular diseases, stroke, cancer, liver steatosis, and musculoskeletal disorders, by increasing the risk of developing osteoarthritis and intervertebral disc degeneration [13,14].

Similarly, with increasing diabetes prevalence, frailty and physical disability are now emerging as the third major category of complications in people with diabetes, after the traditionally acknowledged micro- and macro-vascular complications [15]. However, the assessment of these issues has remained a challenging task, and researchers have not reached a consensus on these impairments related to type II diabetes mellitus. Likewise, Diabetes may also cause myopa-

thy and tendinopathy. Myopathy is characterized by muscle atrophy, weakness, and ischemia, whereas tendinopathy is characterized by deformities and reduced functional precision. In tendinopathy, the three most affected regions with associated conditions are: the hand (cheiroarthropathy, Dupuytren's contracture, flexor tenosynovitis and carpel tunnel syndrome), shoulder (adhesive capsulitis, rotator cuff tendinopathy and tenosynovitis) and foot (Achilles tendinopathy with the risk of tear or rupture), in addition to diffuse idiopathic skeletal hyperostosis [16]. Pathologically, it is characterized by decreased muscle fiber mass and increased fibrosis, with marked extracellular matrix remodeling and collagen deposition. The tendon changes include decreased collagen fibril diameter, changed morphology, increased packing and disorganization, with overall thickening, and calcification [16].

Furthermore, there is also evidence that Type II Diabetes may also cause Parkinson's disease, and there is a connection between Parkinson's disease and insulin dysregulation in the brain, while the connection between Parkinson's disease and type II diabetes mellitus is still up for debate. Insulin is widely recognized to play a crucial role in neuronal survival and brain function; any changes in insulin metabolism and signaling in the central nervous system can lead to the development of various brain disorders. There is accumulating evidence linking type II diabetes mellitus to Parkinson's disease and other neurodegenerative diseases [17]. In addition, the quality of life of patients with type II diabetes is controversial. It is affected by numerous factors, including sex, occupation, disease duration, and the presence of complications such as neuropathy and nephropathy. As with any other chronic disease, DM is associated with many personal, familial, social, and financial issues and even higher mortality rates. Problems such as increased blood glucose, dietary and exercise limitation repeatedly demand for insulin injection, musculoskeletal complications, physical disabilities, sexual dysfunction and vascular disorders are some examples which negatively affect the lives of patients with DM [17].

Material & Methods

Subjects

A total of 300 participants were included in this study. There were 150 diagnosed cases of type II diabetes, and 150 normal cases were included in the control group. Patients with type II diabetes were diagnosed through HBA1C [18] and did not have any other illness or neuropathy. The age group for both groups was 40-60 years.

Method

This was a cross-sectional comparative study in which diabetic and non-diabetic controls were enrolled after fulfilling the inclusion and exclusion criteria. The subjects were asked to sign a consent form, after which demographic variables were recorded for both categories of subjects. Restrictions in activities of daily living were assessed using the DASH questionnaire.

DASH (Disability of Arm, Shoulder and Hand)

The Disabilities of the Arm, Shoulder, and Hand (DASH) questionnaire is a 30-item questionnaire that assesses the ability of a patient to perform certain upper extremity activities. This self-report questionnaire allows patients to rate difficulty and interference with daily life on a 5-point Likert scale. In the DASH scale, higher scores indicate a greater level of disability and severity, whereas lower scores indicate a lower level of disability. The score on the test ranges from 0 (no disability) to 100 (most severe disability) [19].

Statistical Analysis

Data entry and analysis were performed using SPSS version 23.0. Quantitative variables were expressed in the form of graphs and tables using independent sample t-tests.

Results

In the above table (Table 1), the DASH score in terms of means of the experimental and control groups shows a remarkable difference. The mean in the experimental group was 44.60, which was significant in the severity index of the DASH score compared to 14.033 in the control group, indicating that participants who did not have type 2 diabetes were less prone to restriction in activities of daily living than those in the experimental group.

Table 1: Mean DASH score of experimental and Control group.

	Group	N	Mean	Std. Deviation	Std. Error Mean
DASH score	Experimental group	150	44.6	8.29	0.67
	Control group	150	14.03	4.02	0.32

(Table 2) indicates the frequency percentage of patients according to their disability scores. All the experimental groups showed a score above 22.50 and up to 62.50, and the score of the control group did not exceed 25.00, which shows that patients with diabetes have a higher disability index than patients without diabetes. (Figure 1) The control group of individuals remained on the side of a lesser disability index than the diabetic individuals, which means that diabetic patients are at a higher risk of hindrance in activities of daily living than non-diabetic patients. (Table 3).

Table 2: Cross tabulation of DASH scoring between experimental and control group.

		Groups		Total
		experimental group	control group	
DASH SCORE	5.00	0	2	2
	7.50	0	11	11
	10.00	0	26	26
	12.50	0	37	37
	15.00	0	27	27
	17.50	0	28	28
	20.00	0	14	14
	22.50	0	4	4
	25.00	1	1	2
	27.50	3	0	3
	30.00	4	0	4
	32.50	4	0	4
	35.00	14	0	14
	37.50	16	0	16
	40.00	15	0	15
	42.50	12	0	12
	45.00	17	0	17
	47.50	15	0	15
	50.00	10	0	10
	52.50	12	0	12
	55.00	15	0	15
	57.50	9	0	9
	60.00	2	0	2
	62.50	1	0	1
TOTAL		150	150	300

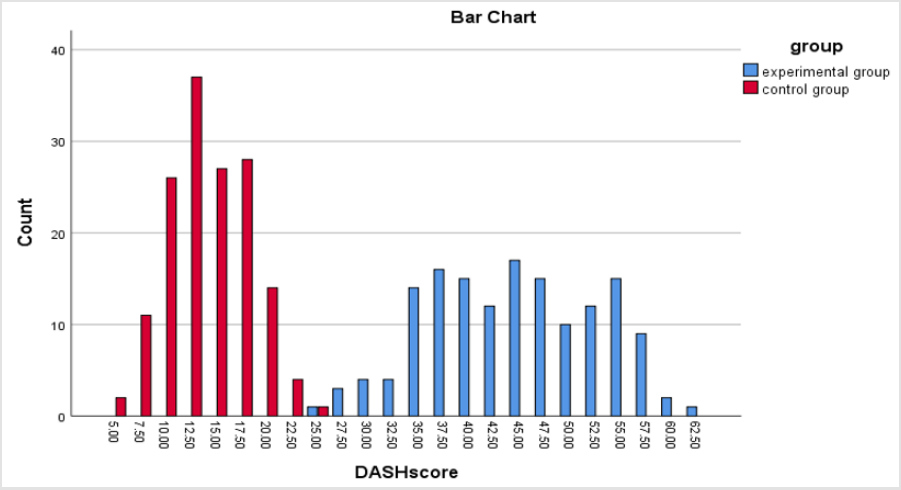

Figure 1: Distribution of DASH score.

Table 3: Independent Sample t-Test.

Variable	p-value	Sig(2-tailed)	df	Mean Difference
DASH Score	<0.001	<0.001	298	30.5666
		<0.001	215.38	30.5666

Discussion

This study showed that disability is more prominent in patients with type II diabetes. Their performance in activities of daily living is restricted by age. As the age of patients with type II diabetes increases, the chance of disability also increase. Diabetic patients have frequently pronounced their disappointment with their health position and valued their quality of life as deprived, which exhibited a clear influence of the disease on their health-related quality of life [20]. Our study also shows that patients with type II diabetes have more restricted physical activity than individuals without diabetes. Pain and incapacity of the upper extremity in individuals with diabetes mellitus when compared with non-diabetic individuals, sixty-three percent (149/236) of the patients with diabetes reported shoulder pain and/or disability [median SPADI score 10.0 (interquartile range 0.0–39.6)]. Compared with the control group, the subgroup of patients with diabetes showed substantial reductions in shoulder ROM, shoulder muscle strength, grip, and key pinch strength (P<0.05). Patients with diabetes had a greater prevalence of decreased sensation (26/27 vs. 14/27) and limited joint mobility of the hand (17/27 vs. 4/27) than the control group [20]. Supporting our study which shows that the means of thee experimental group was 44.6000 compared to the control group which had a mean of 14.0333, it showed that individuals with diabetes have more restrictions and a low quality of life compared to non-diabetic individuals of the same age group.

In study of (Alabdali, et al. [21]) One of the lesser recognized complications of diabetes mellitus are musculoskeletal complications of the upper and lower extremity and the aim of this study was to investigate the prevalence of upper extremity MSK disorders in patients with type II diabetes in the Netherlands, a cross-sectional study with two different approaches, musculoskeletal disorders were observed in 16.3% of patients with type II diabetes compared to 11.2% of non-diabetes patients (p < 0.001, OR 1.53, 95% CI 1.31, 1.80). In the questionnaire study, 200 patients with type II diabetes were included, and 67.3% of them reported a lifetime prevalence of painful upper extremity body sites for at least four weeks. also come in light that upper extremity musculoskeletal disorders have a high prevalence in Dutch patients with type II diabetes presenting in general practice [22]. The prevalence ranges from 16% based on GP-registered disorders and complaints to 67% based on self-reported diagnosis and pain. Early detection and treatment of these disorders may play a role in preventing the development of chronic musculoskeletal disorders. This also supports our study which shows that the DASH score remains high for the experimental group up to 62 compared to the control group, in which a high DASH score remains up to 2, indicating lesser disability in the control group which supports our main hypothesis.

Conclusion

From the above discussion, individuals with diabetes have more restrictions in activity of daily living as compared to those who are non-diabetic of the same age. Due to the single reading and without consideration of other factors such as lifestyle, living standard, and associated diseases, the results may be compromised or limited, which may be taken in future studies to better understand the impact of diabetes on the general health of an individual.

Funding

The current study did not receive any funding or grant.

Conflict of Interest

The authors declare no conflict of interest.

Ethical Approval

The Study was approved by the Ethical Review Board (ERB).

Data Availability Statement

Data will be available upon request.

Consent to Publication

Not Applicable.

References

1. Abedini MR, Bijari B, Miri Z, Shakhs Emampour F, Abbasi A (2020) The quality of life of the patients with diabetes type 2 using EQ-5D-5 L in Birjand. Health and quality of life outcomes 18: 1-9.
2. Choi JH, Kim HR, Song KH (2022) Musculoskeletal complications in patients with diabetes mellitus. The Korean journal of internal medicine 37(6): 1099.
3. Zhang Q, Lin Y, Liu X, Zhang L, Zhang Y, et al. (2021) Diabetic peripheral neuropathy affects pinch strength and hand dexterity in elderly patients. Neural Plasticity, pp. 9959103.
4. Messina R, Iommi M, Rucci P, Reno C, Fantini MP, et al. (2022) Is it time to consider depression as a major complication of type 2 diabetes? Evidence from a large population-based cohort study. Acta diabetologica 59(1): 95-104.
5. Fagot Campagna A, Pettitt DJ, Engelgau MM, Burrows NR, Geiss LS, et al. (2000) Type 2 diabetes among North adolescents: An epidemiologic health perspective. The Journal of pediatrics 136(5): 664-672.
6. Schwartz AV, Hillier TA, Sellmeyer DE, Resnick HE, Gregg E, et al. (2002) Older women with diabetes have a higher risk of falls. Diabetes care 25(10): 1749-1754.
7. Damasceno DC, Volpato GT, Calderon IdMP, Rudge MVC (2002) Oxidative stress and diabetes in pregnant rats. Animal reproduction science 72(3): 235-244.
8. Joshi SA, Patel VD, Eapen C, Hariharan K (2022) Proportion and distribution of upper extremity musculoskeletal disorders and its association with disability in type 2 diabetes mellitus. Journal of Hand Therapy 35(4): 597-604.

9. Songer TJ (1995) Disability in diabetes. Diabetes in America 2: 259-282.
10. Lu FP, Lin KP, Kuo HK (2009) Diabetes and the risk of multi-system aging phenotypes: a systematic review and meta-analysis. PloS one 4(1).
11. Wray LA, Blaum CS (2001) Explaining the role of sex on disability: a population-based study. The Gerontologist 41(4): 499-510.
12. Tinajero MG, Malik VS (2021) An update on the epidemiology of type 2 diabetes: a global perspective. Endocrinology and Metabolism Clinics 50(3): 337-355.
13. Jena D, Sahoo J, Barman A, Behera KK, Bhattacharjee S, et al. (2022) Type 2 diabetes mellitus, physical activity, and neuromusculoskeletal complications. Journal of Neurosciences in Rural Practice 13(4): 705-710.
14. Cannata F, Vadalà G, Ambrosio L, Fallucca S, Napoli N, et al. (2020) Intervertebral disc degeneration: a focus on obesity and type 2 diabetes. Diabetes/metabolism research and reviews 36(1).
15. Ahmad E, Sargeant JA, Yates T, Webb DR, Davies MJ (2022) Type 2 diabetes and impaired physical function: a growing problem. Diabetology 3(1): 30-45.
16. Giha HA, Sater MS, Alamin OA (2022) Diabetes mellitus tendino-myopathy: epidemiology, clinical features, diagnosis and management of an overlooked diabetic complication. Acta Diabetologica 59(7): 871-883.
17. Sabari SS, Balasubramani K, Iyer M, Sureshbabu HW, Venkatesan D, et al. (2023) Type 2 diabetes (T2DM) and Parkinson's disease (PD): a mechanistic approach. Molecular Neurobiology 60(8): 4547-4573.
18. Wang M, Hng T-M (2021) More than just a number. Australian journal of general practice 50(9): 628-632.
19. Williams N Dash (2014) Occupational medicine 64(1): 67-68.
20. Aschalew AY, Yitayal M, Minyihun A (2020) Health-related quality of life and associated factors among patients with diabetes mellitus at the University of Gondar referral hospital. Health and quality of life outcomes 18(1): 62.
21. Alabdali LAS, Jaeken J, Dinant G-J, van den Akker M, Winkens B, et al. (2021) Prevalence of upper extremity musculoskeletal disorders in patients with type 2 diabetes in general practice. Medicines 8(2): 8.
22. Csonka V, Varjú C, Lendvay M (2023) Diabetes mellitus-related musculoskeletal disorders: unveiling the cluster of diseases. Primary Care Diabetes 17(6): 548-553.

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