A Study To Assess The Effectiveness Of Foot Reflexology Therapy On Blood Glucose Control Among Patients With Type2 Diabetes Mellitus In Selected Hospital At Coimbatore : A Quasi Experimental Study.

ABSTRACT

Diabetes mellitus is a chronic metabolic disorder characterized by elevated blood glucose levels and associated complications. Effective management of blood glucose is essential to prevent long term health problems. Foot reflexology is a complementary therapy that may help improve circulation, reduce stress, and support glycemic control. This study aimed to assess the effectiveness of foot reflexology therapy on blood glucose control among patient with type2 diabetes mellitus in selected hospital at Coimbatore. Aquasi-experimental pre-test and post-test control group design was adopted. A total of 60 patients with type2 diabetes mellitus were selected using a non-probability purposive sampling technique, with 30 participants in the experimental group and 30in the control group. The study findings showed that the pre-test mean blood glucose level in the experimental group was 126(SD=11) and it reduced to 89.4(SD=4.7) in the post-test. The calculated t value (18) was significant at $p<0.05$ level. In the control group, the pre-test mean was 137(SD=9.3) and the post-test mean was 134.4 (SD=5.9) with no significant difference (t=1.3). The post-test comparison between experimental between and control groups showed a significant difference t=34). The findings indicate that foot reflexology therapy was effective in controlling blood glucose levels among patients with type2 diabetes mellitus.

KEYWORDS

Foot reflexology, Type2 diabetes mellitus, Blood glucose, A quasi experimental study

INTRODUCTION

Diabetes mellitus is a chronic metabolic disorder characterized by persistent hyperglycemia due to defects in insulin secretion, insulin action, or both. Type 2 diabetes mellitus accounts for the majority of cases and is increasing rapidly worldwide, particularly in developing countries like India. Poor glycemic control is associated with severe complications such as cardiovascular disease, neuropathy, nephropathy and retinopathy, significantly affecting quality of life and increasing healthcare burden.

Management of T2DM focuses on maintaining optimal blood glucose levels through medications, diet, and physical activity. However long-term pharmacological therapy may lead to poor adherence due to side effects and cost, highlighting the need for supportive complementary therapies.

Foot reflexology is a non-invasive technique involving pressure application to specific points on the feet corresponding to body organs. It is believed to improve circulation, reduce stress, and enhance metabolic function. Evidence suggests that reflexology may help regulate blood

glucose levels in diabetic patients. Therefore, this study aims to evaluate the effectiveness of foot reflexology therapy on blood glucose control among patients with T2DM in a selected hospital at Coimbatore.

STATEMENT OF PROBLEM

'A study to assess the effectiveness of Foot Reflexology Therapy on Blood Glucose Control among patients with Type 2 Diabetes Mellitus in selected hospital at Coimbatore'.

OBJECTIVES

1. To assess the blood glucose level in patients with type 2 diabetes mellitus among experimental group and control group before foot reflexology.
2. To apply foot reflexology therapy to type 2 diabetes mellitus patients in experimental group.
3. To reassess the effectiveness of foot reflexology therapy on blood glucose levels in patients with type 2 diabetes mellitus patients in the experimental group.
4. To compare the post-test level of blood glucose level in patients with type 2 diabetes mellitus between experimental group and control group.
5. To find out the association between the post-test level of blood glucose level among type 2 diabetes mellitus in experimental group with their selected demographic variables.

HYPOTHESIS

H1 -There will be a significant difference between pre and post-test blood glucose levels among patients with type 2 diabetes mellitus in the experimental and control group.

H2 -There will be a significant association between the post-test level of blood glucose level among patients with type 2 diabetes mellitus in experimental and control group with their selected demographic variables.

MATERIALS AND METHODS

A quasi-experimental pre-test and post-test control group design was conducted among 60patients with type2 diabetes mellitus in selected hospital at Coimbatore. Participants were divided into experimental and control groups. The experimental group received foot reflexology therapy, while the control group received routine care. Blood glucose levels were assessed pre-and post-intervention and analysed using t-tests.

RESULTS AND DISCUSSION

Table 4.1: frequency and percentage distribution of samples according to the demographic variables among patients with type 2 diabetes mellitus in experimental and control group

S.No	DemographicVariables	ExperimentalGroup		ControlGroup	
		Frequency (f)	Percentage (%)	Frequency (f)	Percentage (%)
1.	**Ageinyears**				
	a)Below40years	6	20	8	27
	b)41-50years	10	33	11	37
	c)51-60years	8	27	5	16
	d)Above60years	6	20	6	20
2.	**Sex**				
	a)Male	17	57	20	67
	b)Female	13	43	10	33
3.	**Education**				
	a) Illiterate	7	23	7	23
	b)Primary	4	13	9	30
	c)Secondary	10	34	6	20
	d)Graduates	9	30	8	27
4.	**Occupation**				
	a) Unemployed	8	27	6	20
	b) Selfemployed	10	33	11	37
	c)Private employed	7	23	9	30
	d)Governmentemployed	5	17	4	13

5.	**Incomepermonth**				
	a) BelowRs.50000	8	27	5	17
	b) Rs.5001-Rs.10000	9	30	12	40
	c) Rs.10001-Rs.20000	7	23	8	26
	d) AboveRs.20001	6	20	5	17
6.	**Typeoffamily**				
	a) Nuclear	11	37	12	40
	b) Joint	10	33	11	37
	c) Extended	9	30	7	23
7.	**Typeoffood**				
	a) Vegetarian	8	27	8	26
	b) Non-vegetarian	10	33	14	48
	c) Mixed	12	40	8	26
8.	**Bodymassindex**				
	a) Below18.5	3	10	4	13
	b) 18.6-24.9	14	47	12	40
	c) 25-29.9	8	27	10	34
	d) Above30	5	16	4	13
9.	**Personalhabits**				
	a) Smoking	10	33	12	40
	b) Alcoholism	13	43	6	20
	c) Tobaccochewing	5	17	7	23
	d) None	2	7	5	17
10.	**Diabeticcomplications**				
	a) Yes	19	63	16	53
	b) No	11	37	14	47

Table 4.1 shows the distribution of patients with type 2 diabetes mellitus in experimental group 6(20%) of the samples in the age group below 40 years, 10(33%) were in the age group between 41 – 50 years, 8 (27%) were in the age group 51 – 60 years and 6(20%) of the samples in the age group above 60 years. In control group, 8(27%) of the samples in the age group of below 40 years, 11(37%) of the samples in the age group between 41 – 50 years, 5 (17%) of the samples in the age group between 51 – 60 years and 6(20%) of the samples in the age group of above 60 years, respectively.

Regarding sex in experimental group shows that 17(57%) were males and 13(43%) were females. In control group 20(67 %) were males and 10(33%) were female.

Among the samples regarding educational status among patients with type 2 diabetes mellitus in experimental group 7(23%) had primary education, 4(13%) had secondary education, 10(34%) had secondary education and 9(30%) were graduates. In control group, 7(23%) had primary education, 9(30%) had secondary education, 6(20 %) were secondary and 8(27%) were graduates.

Distribution of samples according to occupational status, in experimental group 8(27%) were unemployed, 10(33%) were self-employed, 7(23%) were private employed and 5(17%) were government employed. In the control group 6(20%) were unemployed, 11(37%) were self-employed, 9(30%) were private employed and 4(13%) were government employed.

Regarding monthly income among patients with type 2 diabetes mellitus in experimental group 8(27%) had an income below Rs.5000, 9(30%) had an income between Rs.5001 – Rs.10000, 7(23%) had an income between Rs.10001 – Rs. 20000 and 6(20%) had an income above Rs. 20001. In control group 5(17%) had an income below Rs.5000, 12(40%) had an income between Rs.5001 – Rs.10000, 8(26%) had an income between Rs.10001 – Rs.20000 The distribution of samples according to the type of family, in experimental group 11(37%) belonged to nuclear family,10(33%) to joint family and 9(30%) to extended family. In control group 12(40%) belonged to nuclear family, 11(37%) to joint family and 7(23%) to extended family.

Regarding the type of food, in experimental group 8(27%) were vegetarians, 10(33%) were non-vegetarians and 12(40%) consumed a mixed diet. In control group 8(26%) were vegetarian, 14(48%) were non-vegetarian and 8(26%) consumed mixed food.

The BMI distribution of patients with type 2 diabetes mellitus in experimental group reveals that 3(10%) had a BMI below 18.5, 14(47%) had a BMI between 18.6- 24.9, 8(27%) had a BMI between 25-29.9 and 5(16%) had a BMI above 30. In control group 4(13%) had a BMI below 18.5, 12(40%) had a BMI between 18.6-24.9, 10(34%) had a BMI between 25-29.9 and 4(13%) had a BMI above 3

Regarding personal habits in experimental group reveals that 10(33%) were smokers, 13(43%) consumed alcoholism, 5(17%) used to tobacco by chewing and 2(7%) had no such habits. In control group 12(40%) were smoking, 6(20%) were consumed alcohol, 7(23%) used tobacco by chewing and 5(17%) had no such habits.

Regarding diabetic complications in experimental group 19(63%) had complications 11(37%) did not. In control group 16(53%) had complications and 14(47%) did not. And 5(17%) had an income above Rs.20001.

Table 4.2: Distribution of samples according to the pre-test level of glucose level in experimental and control groups

Bloodglucoselevel	Pre-test			
	Experimentalgroup n=30		Control group n=30	
	f	%	f	%
Normalglucoselevel	0	0	0	0
Impairedglucoselevel	8	27	12	40
Diabetic	22	73	18	60
Total	30	100	30	100

Table 4.2: shows that during the pre-test in experimental group none of them had normal blood glucose level, 8(27%) had impaired glucose level and 22(73%) had diabetic. In control group none of them had normal glucose level, 12(40%) had impaired glucose level and 18(60%) had diabetic.

Table 4.3: Distribution of samples according to the post-test level of glucose level among patient with type 2 diabetes mellitus in experimental and control group.

Bloodglucoselevel	Post-test			
	Experimentalgroup n=30		Controlgroupn=30	
	f	%	f	%
Normalglucoselevel	23	77	0	0
Impairedglucoselevel	7	23	6	20
Diabetic	0	0	24	80
Total	30	100	30	100

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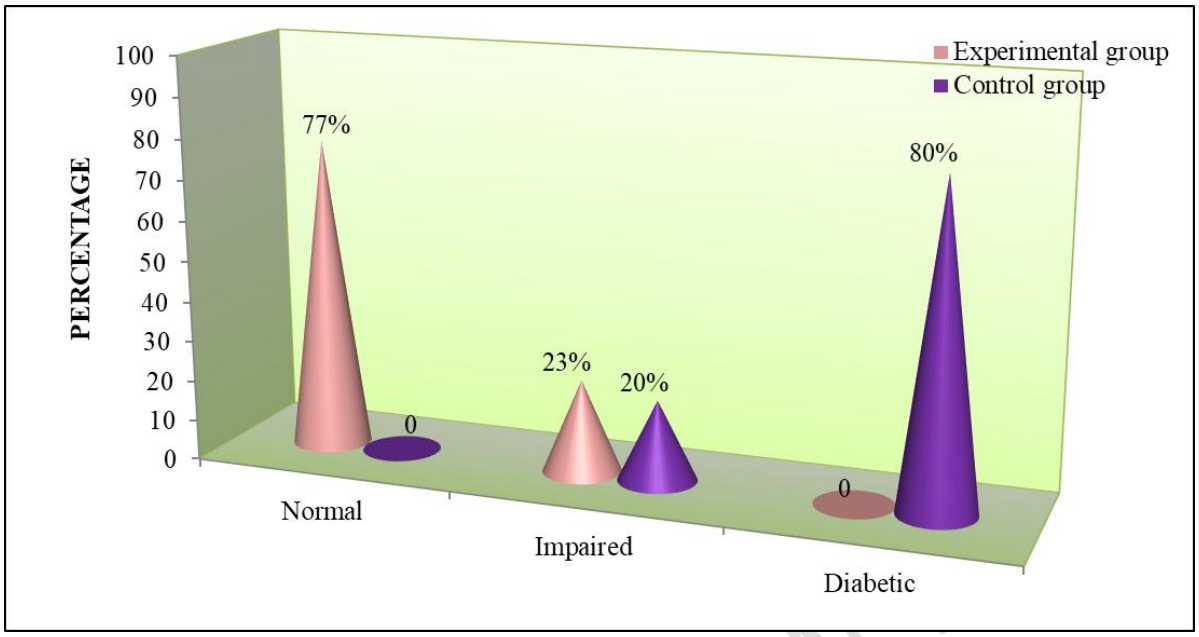

Table 4.3: shows that post-test in experimental group 23(77%) had normal glucose level, 7(23%) had impaired glucose level and none of them had diabetic. In control group none of them had normal glucose level, 6(20%) had impaired glucose level and 24(80%) had diabetic

Table 4.4: mean, standard deviation, mean differences and paired t value regarding blood glucose level between pre-test and post-test in experimental group.

S.No	ExperimentalGroup	Mean	SD	Mean difference	t-test
1.	Pre-test	126	11	39.6	18
2.	Post-test	89.4	4.7		

Significant at p<0.05 level

Table 4.4 shows that pre- test mean score in experimental group was 126 with a standard deviation of 11, whereas the post -test mean score was 89.4 with a standard deviation of 4.7. The mean difference was 39.6. The calculated 't' value was 18, which is significant at p<0.05

level. This finding revealed that foot reflexology therapy effectively controlled blood glucose level among patients with type 2 diabetes mellitus. Hence H1 was accepted.

Table 4.5: mean, standard deviation, mean differences and paired t value regarding blood glucose level between pre-test and post-test in control group.

S.No	Controlgroup	Mean	SD	Mean difference	t-value
1.	Pre-test	137	9.3	2.6	1.3
2.	Post-test	134.4	5.9		

*No significant at p<0.05 level

Table 4.5: shows that in control group pre -test mean score was 137 with a standard deviation of 9.3 while the post -test mean score was 134.4 with a standard deviation of 5.9. The mean difference was 2.6, and calculated 't' value was 1.3. This finding reveals that there were no significant changes in blood glucose control among patient with type 2 diabetes mellitus in the control group. Hence H1 was rejected.

Table 4.6: mean, standard deviation, mean differences and unpaired t value of post-test score level of blood glucose control among patient with type 2 diabetes mellitus in experimental and control group.

S.No	Groups	Mean	SD	Mean difference	't'value
1.	Experimentalgroup	89.4	4.7	45	34
2.	Control group	134.4	5.9		

***Significantatp<0.05level**

Table 4.6shows that the experimental group post- test mean score was 89.4 with a standard deviation of 4.7, and in the control group, the mean score was 134.4 with a standarddeviationof5.9.Themeandifferencewas45.Thecalculatedunpairedtvaluewas34, which indicates significant at the 0.05 levels. It showed that there was a significant difference

between the post- test scores of control groups. This implies that blood glucose level were significally controlled after administering foot reflexology therapy.

Table 4.7: Association between the post-test levels of blood glucose among patient with type 2 of the diabetes mellitus in experimental group with their selected demographic variables.

S.No	Demographicvariables	Impaired glucose level	Normal glucose level	χ^2	Table value and df
1.	**Ageinyears**				
	a) Below40years	2	4		
	b) 42-50years	3	7	1.23	7.815
	c) 51-60years	1	7		(3)
	d) Above60years	2	4		
2	**Sex**				
	a) Male	5	12	0.165	3.841
	b) Female	3	10		(1)
3	**Education**				
	a) Illiterate	2	5		
	b) Primary	1	3	0.507	7.815
	c) Secondary	2	8		(3)
	d) Graduates	3	6		
4	**Occupation**				
	a) Unemployed	0	8		
	b) Selfemployed	5	5	13.44*	7.815
	) Private employed	0	7		(3)
	d)Governmentemployed	3	2		
5	**MonthlyIncome**				
	a) BelowRs.5000	0	8		
	b) Rs.5001-Rs.10000	3	6	5.466	7.815
	c) Rs.10001-20000	2	5		(3)
	d) Above 20001	3	3		

6	**Typeoffamily**				
	a) Nuclearfamily	5	6		
	b) Jointfamily	3	7	6.458*	5.991
	c) Extended family	0	9		(2)
7	**Typeoffood**				
	a) Vegetarian	0	8		
	) Non-vegetarian	4	6	6.35*	5.991
	Mixed	4	8		
8	**BodyMassIndex**				
	a) Below18.5	1	2		7.815
	b) 18.6-24.9	5	9	2.694	(3)
	c) 25-29.9	2	6		
	Above30	0	5		
9	**Personalhabits**				
	a) smoking	3	7		
	b) alcoholism	5	8	3.67	7.815
	) Tobaccochewing	0	5		(3)
	None	0	2		
10.	**Diabeticcomplications**				
	a) Yes	5	14	0.003	3.841
	b) No	3	8		(2)

Table 4.7 shows that the demographic variable of **occupation, type of family** and **type of food** showed that significant association with the post test score of blood glucose level in experimental group and other variables like age, sex, education, monthlyincome,bodymassindex,personalhabitsanddiabeticcomplicationsshowed no significant association with the post-test level of blood glucose control among patientswithtype2diabetesmellitus.Hencetheformulatedresearchhypothesis$H_2$was accepted.

DISCUSSION

The first objective was to assess the blood glucose level in patients with type 2 diabetes mellitus among experimental group and control group before foot reflexology.

During the pre- test in the experimental group none of them had normal blood glucose level, 8(27%) had impaired glucose level and 22(73%) were diabetic. In the control group, none of them had normal glucose level, 12(40%) had impaired glucose level and 18(60%) were diabetic

The second objective was to apply foot reflexology therapy to type 2 diabetes mellitus patients in experimental group.

In the Post- test in the experimental group 23(77%) had normal glucose level, 7(23%) had impaired glucose level and none of them had diabetic. In control group none had normal glucose level, 6(20%) had impaired glucose level and 24(80%) were diabetic.

The third objective was to reassess the effectiveness of foot reflexology therapy on the level of blood glucose level in patients with type 2 diabetes mellitus patients in experimental group.

Pre-test mean score in experimental group was 126 with a standard deviation of 11 and post -test mean score was 89.4 with a standard deviation of 4.7. The mean difference was 39.6. The calculated 't' value was 18, which is significant at $p<0.05$ level. This finding revealed that foot reflexology therapy helped controlled blood glucose level among patients with type 2 diabetes mellitus

In control group pre-test mean score was 137 with a standard deviation of 9.3 and post-test mean score was 134.4 with a standard deviation of 5.9. The mean difference was 2.6. The calculated 't' value was 1.3. This finding revealed that there were no significant changes in blood glucose control among patients with type 2 diabetes mellitus.

The fourth objective was to compare the post-test level of blood glucose level in patients with type 2 diabetes mellitus between experimental group and control group.

In experimental group post-test mean score was 89.4 with a standard deviation of 4.7 while n the control group mean score was 134.4 with a standard deviation of 5.9. The mean difference was 45. The calculated unpaired t value was 34, which indicates significant at 0.05 levels. It showed that there was a significant difference between the post-test scores of the two groups, it implies that there was a significantly controlled blood glucose level after administering foot reflexology therapy.

CONCLUSION:

The study concludes that foot reflexology therapy is effective in reducing blood glucose levels among patients with Type2 Diabetes mellitus. A significant improvement was observed in the experimental group compared to the control group

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CONFLICT OF INTERST

The author declares that there is no conflict of interest regarding the publication of the study.

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