

A correlative study between stages of Peripheral Neuropathy with self-care management among Diabetic patients at selected hospitals in Bengaluru with a view to develop an informational pamphlet.

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#### **Abstract:**

Diabetes is a significant non-communicable disease in India. Due to socioeconomic development, urbanization, and shifting lifestyles, diseases that were formerly uncommon in emerging nations are now more prevalent. The present correlative study between stages of Peripheral Neuropathy with Self-care Management among Diabetic Patients at selected hospitals In Bengaluru was conducted to assess the stages of diabetic peripheral neuropathy and to find out correlation between the stages of diabetic peripheral neuropathy and self-care-management score of diabetic patients. A standard diabetic self-care management (DSMQ) questionnaire was administered to assess the Self-care management of diabetic mellitus among diabetic patients and Michigan neuropathy screening instrument (MNSI) questionnaire was administered to assess the stages of peripheral neuropathy. The main study was conducted at selected hospitals of Bengaluru with 60 samples each selected by purposive sampling technique. Data was collected and analyzed by using descriptive and inferential statistics.

The results of the study revealed that most of respondents, 20(33.3%) belongs to the age group of 51-60 years and around half i.e. 27(45.0%) had history of Diabetes more than 5 years. In context of other associated disorders majority 41(68.4%) of them had hypertension. In regard to diabetic foot/ ulcer, minority i.e. only 1(1.7%) had presented with foot ulcer. The outcomes of Karl Pearson correlation between DSMQ and MNSI among diabetic patients revealed that, there was positive correlation between stages of peripheral neuropathy and self-care management of diabetic patients i.e. MNSI-A: 0.369\* and MNSI –B: 0.338\* and it was found to be statistically significant at 0.05 level ( $p < 0.05$ ).

The study also revealed significant association between demographic variables like of income per month and medication for diabetics with peripheral neuropathy and self care management at df ( $p < 0.05$ ) Hence the research hypothesis ( $H_2$ ) and ( $H_3$ ) was partially accepted.

**Key Words:** Diabetes Mellitus, Diabetic Peripheral Neuropathy, Diabetic Self-Management, Michigan neuropathy screening instrument

**Introduction:**

According to a Cameron Institute study on the burden of non-communicable diseases in India, Diabetes is a significant non-communicable health issue. Karnataka, having prevalence of 7.5% of Diabetes is considered on sixth position in India. Due to socioeconomic development, urbanization, and shifting lifestyles, diseases that were formerly uncommon in emerging nations are now more prevalent. The disease is chronic and can only be managed because there is no cure for it. As a result, diabetes patients must be self-motivated and have the necessary information to control their condition.

One of the complications of Diabetes is peripheral neuropathy i.e. nerve damage from persistently elevated blood glucose. Diabetic peripheral neuropathy is one of the main causes of disability. Neuropathic pain affects 20 to 30% of people with diabetic peripheral neuropathy, which dramatically reduces quality of life.

**Need for The Study**

In 2019 at Kurnool district of Andhra Pradesh, a cross-sectional study was done to determine the prevalence and associated determinants of diabetic peripheral neuropathy in people with type-2 DM. The study, which included 336 participants, found that the prevalence of the DPN was 39.3%, with 28.9% of men and 10.4% of women. Nearly half of them (nearly 205) reported having a burning foot feeling, 124 reported having numbness in their feet, and more than 130 reported having callosity in their feet. The study found a strong relationship between age, sex, the duration of diabetes, hypertension, and BMI and the severity of DPN. The International Association for the Study of Pain (IASP) has defined neuropathic pain as "pain initiated or caused by a primary lesion or dysfunction in the nervous system". DPN, or distal symmetrical polyneuropathy, is the type of type 2 diabetes

complication that occurs the most frequently. Up to 50% of people with diabetes experience DPN. Severe discomfort, loss of mobility, and an elevated risk of foot ulceration and amputation are among side effects of diabetic peripheral neuropathy.

While educating diabetic patients is important, it is even more crucial that they put that knowledge into practice by engaging in self-care routines. Self-care behaviours include following a diet, avoiding foods high in fat, exercising frequently, checking one's own blood sugar levels, taking care of one's feet, and lowering one's level of glycosylated haemoglobin. Diabetes self-management cannot be the main goal in a patient's care rather, the activities should be assessed for their effectiveness in promoting behavioural change

**Objectives**

The objectives of the study were:

1. To assess the stages of diabetic peripheral neuropathy and self-care management of diabetic patients
2. To find out the correlation between stages of diabetic peripheral neuropathy and self-care-management score of diabetic patients
3. To find out the association between stages of peripheral neuropathy and selected socio-demographic variables
4. To find out the association between self-care management and selected socio-demographic variables
5. To develop an informational pamphlet on Diabetic peripheral neuropathy

**Hypothesis:**

- H<sub>1</sub>: There will be a significant relationship between the stages of Diabetic Peripheral Neuropathy and the self-care management
- H<sub>2</sub>: There will be an association between stages of peripheral neuropathy and the selected socio-demographic variables at 0.05 level of significance.

- H<sub>3</sub>: There will be an association between self-care management and the selected socio-demographic variables at 0.05 level of significance.

**Research Methodology**

**Research Approach**

Quantitative research approach was used.

**Research design**

Descriptive correlative research design

**Research Variables**

Stages of peripheral neuropathy and self-care management of diabetic mellitus are the research variables and are independent variables.

**Contributing Variables**

The study consisted of Age, gender, education, occupation, income, marital status, family history of diabetes, age onset of diabetes, duration of diabetes, anti-diabetic medication, associated disorder, presence of diabetic foot ulcer as the contributing variables.

**Research Setting**

The setting is the physical location and condition in which data collection takes place in a study. The present study was conducted at Magna centre for obesity diabetes and endocrinology Bengaluru and Dinka multispecialty clinic and diabetic centre, Bengaluru.

**Sample**

In this study, the sample refers to, 60 diabetic patients, who are diagnosed with type 1 and type 2 diabetes patients who are consulting at Magna centre for obesity diabetes and endocrinology Bengaluru. And Dinka multispecialty clinic and diabetic centre, Bengaluru.

**Sampling Technique**

Purposive sampling technique

**Method Of Data**

**Collection**

Based on the objectives of the study a standardized Diabetic self-care management questionnaire (DSMQ) and Michigan neuropathy screening instrument (MNSI) scale was adopted for the study.

**Results**

The data was organized and presented under the sections as

1. Demographic Variables
2. Distribution of Patients according to DSMQ & MNSI
3. Coorelation between DSMQ & MNSI
4. Association between DSMQ score, MNSI and selected demographic variables

**Section -1: Description of demographic variables of diabetic patients**

**Table 1.1** Frequency and percentage distribution of diabetic patients according to Age, gender, education, occupation, income, marital status

S.No	Demographic variables	Frequency	Percentage (%)
1.	Age in years		
	31-40	11	18.3
	41-50	9	15.0
	51-60	20	33.3
	61-70	15	25.0
	71-80	5	8.3
2.	<b>Gender</b>		
	a. Male	24	40.0
	b. Female	36	60.0
3.	<b>Educational status</b>		

	a. Illiterate	4	6.7
	b. Primary	9	15.0
	c. Secondary	25	41.7
	d. Graduate	22	36.7
4	<b>Occupational status</b>		
	a. Employed	23	38.3
	b. Unemployed	27	45.0
	c. Retired	10	16.7
5	<b>Income per month (in Rupees)</b>		
	a. Below 10,000	21	35.0
	b. 10,001-20,000	6	10.0
	c. 20,001-30,000	24	40.0
	d. 30,001-40,000	7	11.7
	e. 40,001-50,000	2	3.3
	f. Above 50,000		
6	<b>Marital status</b>		
	a. Single	4	6.7
	b. Married	54	90.0
	c. divorced	2	3.3
	d. widowed	0	0
	e. separated	0	0
7	<b>Do you have family history of Diabetes</b>		
	a. Yes	18	30.0
	b. no	29	48.3
	c. not sure	13	21.7
	<b>Age onset of Diabetes</b>		
	a. Below 20 years	5	8.3
	b. 21-30 years	8	13.3
	c. 31-40 years	8	13.3
	d. 41-50 years	10	16.7
	e. 51-60 years	25	41.7
f. Above 60 years	4	6.7	
9	<b>Duration of diabetes</b>		
	Below 1 year	10	16.7
	2-3 years	14	23.3
	4-5 years	9	15.0
	More than 5 years	27	45.0
10	<b>Are you on any medicine for diabetes (All are in medicine, Yes (n=60), If yes,</b>		
	Glycomet	24	40.0
	Metformin	23	38.3
	Insulin	4	6.7
	Other tablets	9	15.0

11.	<b>Other associated disorders</b>		
	Hypertension	41	68.4
	Cardiovascular disease	0	0
	Thyroid	2	3.3
	No any associated disorders	17	28.3
12.	<b>Presence of diabetic foot/ulcer</b>		
	Yes	1	1.7
	No	59	98.3

**Section -2: Description of diabetic patients according to level of DSMQ and MNSI**

Table 2.1 Frequency and percentage distribution of diabetic patients according to DSMQ and MNSI

Table 2.1 reveals the range, mean and SD on self-care practices of diabetic patients.

S.No.	DSMQ (Transformed scores)	Range (Max score=10)	Mean	SD	Mean %
1	Glucose management	1-9	5.82	2.09	<b>58.2</b>
2	Dietary control	0-8	4.53	2.16	<b>45.3</b>
3	Physical Activity	1-7	4.07	1.61	<b>40.7</b>
4	Health care use	2-8	4.89	1.73	<b>48.9</b>
5	Over all self-care	0-10	2.67	2.58	<b>26.7</b>

The above table reveals the mean score of DSMQ scale. In glucose management domain with the SD of 2.09, whereas the mean score in the domain of overall self-care is low with the SD of 2.58

**Table-2.2:** Distribution of diabetic patients according to Level of self-care (DSMQ).

n=60

S.No.	Level of self-care (DSMQ scores) Max. score=50	Frequency	Percentage
1	Inadequate (<50%)	47	78.3
2	Moderately adequate (50%-75%)	13	21.7
3	Adequate (>75%)	0	0
Total		60	100

**Table 2.2** reveals frequency and percentage of level of self-care (DSMQ)

The data in table 2.2 depicts that the maximum 47 with the percentage of 78.3 level of self-care was inadequate, 13 with the percentage of 21.7 was moderately adequate

**Table-2.3:** Distribution of diabetic patients according to Level of MNSI-A n=60

S. No.	Level of MNSI(A) Max. score=15	Frequency	Percentage
1	Normal(<8)	56	93.3
2	Below normal (≥7)	4	6.7
Total		60	100

the table 2.3 reveals the frequency and percentage of level of MNSI part A score. 56(93.3) were normal and 4(6.7%) were had below normal score

**Section -3: Correlation between DSMQ and MNSI among diabetic patients**

**Table 3.1:**Correlation between DSMQ and MNSI among diabetic patients

S.No.	Correlation	DSMQ	
		r	p-value
1	MNSI_A	0.369*	p<0.05
2	MNSI-B	0.338*	p<0.05

Note: \*-significant (p<0.05)

**Table 3.1** depicts the outcome of correlation between DSMQ and MNSI among diabetic patients, The data shows that, the score obtained were significantly higher in MNSI- A =0.369\* (p<0.05), and less in MNSI-B = 0.338\* (p<0.05)

**Section -4: Association between DSMQ and MNSI among diabetic patients with their demographic variables.**

**Table 4.1: Association between DSMQ among diabetic patients with their demographic variable n=60**

S. No	Demographic variables	Sample (n=60)		DSMQ				Chi square analysis	p-value
				≤Median		>Median			
		F	%	F	%	F	%		
1.	<b>Gender</b>								
	a. Male	24	40.0	12	40.0	12	40.0	0, df=1, NS	p>0 .05
	b. Female	36	60.0	18	60.0	18	30.0		
2	Age in years (Classification based on quartiles of individual age)								
	a. Below 45 years	14	23.3	6	20.0	8	26.7	1.101, df=2, NS	p>0 .05
	b. 45-60 years	26	43.3	15	50.0	11	36.7		
c. Above 60 years	20	33.3	9	30.0	11	36.7			
3	<b>Educational status</b>							2.542, df=3, NS	p>0 .05
	a. Illiterate	4	6.7	1	3.3	3	10.0		
	b. Primary	9	15.0	3	10.0	6	20.0		
	c. Secondary	25	41.7	14	46.7	11	36.7		
	d. Graduate	22	36.7	12	40.0	10	33.3		
	e. Post graduate	-	-	-	-	-	-		
f. Any other specify	-	-	-	-	-	-			

4	<b>Occupational status</b>								
	a. Employed	23	38.3	10	33.3	13	43.3	1.717, df=2, NS	p>0 .05
	b. Unemployed	27	45.0	16	53.3	11	36.7		
	c. Retired	10	16.7	4	13.3	6	20.0		
5	<b>Income per month (in Rupees)</b>								
	a. Below 10,000	21	35.0	10	33.3	11	36.7	10.881, df=4, S	P< 0.0 5
	b. 10,001-20,000	6	10.0	2	6.87	4	13.5		
	c. 20,001-30,000	24	40.0	10	33.3	14	46.7		
	d. 30,001-40,000	7	11.7	7	23.3	0	0		
	e. 40,001-50,000	2	3.3	1	3.3	1	3.3		
	f. Above 50,000								
6	<b>Marital status</b>								
	a. Single	4	6.7	2	6.7	2	6.7	0, df=2, NS	p>0 .05
	b. Married	54	90.0	27	90.0	27	90.0		
	c. divorced	2	3.3	1	3.3	1	3.3		
	d. widowed	-	-	-	-	-	-		
	e. separated	-	-	-	-	-	-		

**Limitations**

1. Obtaining the assistance of diabetic clinics and diabetic patients to participate in the study was challenging due to the COVID-19 pandemic.
2. The participants found the questionnaire to be tedious to read and complete because it was lengthy.

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