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Research Article

A Descriptive study to assess the Factors interfering with Glycemic Control among Type 2 Diabetes Mellitus patients

Ankita, L. Ranganayki, Kaur Kiranpreet

Department of Medical Surgical Nursing, Sri Guru Ram Das College of Nursing, Vallah, Sri Amritsar, Punjab

Abstract

Aim: This study is conducted to assess factors interfering with good and poor glycemic control.

Introduction: There is a rising trend in the prevalence of diabetes in India over recent years, poor and inadequate glycemic control affected by many factors such as socio-demographic, clinical and behavior factors constitutes a major risk factor for the development of diabetes complications.

Materials and Methods: A descriptive study was conducted using purposive sampling technique by enrolling 100 subjects with type 2 Diabetes Mellitus having 30 and above 30 years of age, attending OPD or admitted in SGRD hospital. Data collected by observation and interviewing the subjects using self-structured questionnaire. Analysis and interpretation were done by descriptive and inferential statistics.

Results: It shows that total of 100 subjects 61% had poor and 39% had good glycemic control. Factors such as age 50–59 years 18 (29.5%), male 36 (59%), informal education 30 (49.1%), BMI overweight 27 (44.3%), duration of diabetes 4–6 years, 30 (49.2%), and co-morbidities such as hypertension 38 (62.3%) and renal diseases 20 (32.8%), inappropriate diabetic diet 37 (60.7%), and 35 (57.4%) inadequate exercise alcohol consumption 26 (42.6%) were factors interfering glycemic control. Complications related to diabetes were 10 (16.4%) retinopathy and nephropathy, 23 (37.7%) neuropathy, 4 (6.6%) coronary artery disease, 8 (13.1%) foot ulcer, 15 (24.6%) stroke, 5 (8.2%) cataract and their odd ratios (OR-3.627, 7.45, 48.22, 6.18, 12.55, 18.09, 3.913, and 1.07, respectively).

Conclusion: There is need to achieve an understanding of the extent of glycemic control in patients with type 2 DM and to see the factors interfering with good and poor glycemic control groups, and as a result, to spot the factors affecting glycemic control.

Keywords: Glycemic control, HbA1c value, factors, type 2 diabetes mellitus

Introduction

Type 2 diabetes is a heterogeneous group of disorders characterized by variable degree of insulin resistance, impaired insulin secretion, and increased glucose production.[1] There are many risk factors that increase the chances for diabetes, include family history of diabetes, ethnic background, being overweight, physical stress (such as surgery or illness), use of certain medications, including steroids, injury to the pancreas (such as infection, tumor, surgery, or accident), autoimmune disease, high blood pressure, abnormal blood cholesterol or triglyceride levels, age (risk increases with age), smoking, and history of gestational diabetes.

Diabetes mellitus is recognized as the disease "epidemic" of the 21st century affecting millions of people worldwide. According to the WHO and the International Diabetes Federation, diabetes has become the primary global health-care challenge.[2] Glycemic control means to maintain blood glucose levels within normal range in people with diabetes. Glycemic control can be assessed based on controlling two measurements; fasting plasma glucose and glycosylated

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Address for Correspondence:
Ankita L. Ranganayaki, Sri Guru Ram Das College of Nursing, Vallah, Sri Amritsar, Punjab. E-mail: ankitatiwari1205@gmail.com

hemoglobin (HbA1c). HbA1c is a proxy measurement of the average blood glucose levels over the previous 2–3 months. For this reason, HbA1c is known to be the best indicator for long-term glycemic control in people with diabetes. The WHO has recommended a level of HbA1c below 6.5% for healthy adults with a long life expectancy. However, few studies used 6.5% HbA1c as the criterion to classify patients with diabetes into glycemic control and non-glycemic control groups. Wide glycemic variability may contribute to development of diabetic complications broadly classified into two major categories: macro vascular (e.g., peripheral arterial disease, stroke, and coronary artery disease) and micro vascular (e.g., retinopathy, neuropathy, and nephropathy).[3] Research study was conducted on the prevalence of type 2 diabetes mellitus among urban Sikh population of Amritsar and results clearly indicated that the young Sikh adults below 40 years of age have similar high BMI, WC, and WHR to that of the older adults above 40 years of age.[4]

The aim of this study was to achieve an understanding of the extent of glycemic control in patients with type 2 DM and to see the differences interfering with good and poor glycemic control groups, and as a result, to spot the factors affecting glycemic control.

Materials and Methods

A descriptive study was conducted using purposive sampling technique by enrolling 100 subjects with type 2 Diabetes Mellitus having 30 and above 30 years of age, attending OPD or admitted in SGRD hospital, Vallah, Sri Amritsar, Punjab, India. Data collection was done by observation and interviewing the subjects using self-structured questionnaire which consist of four parts – socio-demographic, clinical, behavior factors, and complications related to diabetes mellitus. Analysis and interpretation were done using descriptive (frequency, percentages) and inferential statistics (Chi-square, Odd ratios) [Figure 1].

Results

Section-I

Table 1 shows that subjects with age 40–49 years 20 (51.3%), sex (male) 22 (56.4%), and female 17 (43.6%), subjects with primary/secondary education 26 (66.7%), 22 (56.4%) vegetarians, 18 (46.2%) with family history of first degree relatives, and 37 (94.9%) with source of information from health-care providers had good glycemic control. In contrast, age 50–59 years 18 (29.5%), married subjects 50 (81.9%), subjects in rural area 50 (81.9%), Source of information of subjects from relatives and friends. 40 (34.4%) had poor glycemic control.

Table 2 shows that among 100 of total subjects of type 2 diabetes mellitus 61% of subjects had poor glycemic control and 39% had good glycemic control.

Table 3 shows BMI with normal weight 23 (59%), 18 (46.2%) subjects with ≤ 3 of duration of diabetes mellitus, 26 (66.7%) subjects with moderated recent blood glucose values, and 39 (100%) subjects taking oral glycemic agents as a treatment had good glycemic control whereas in poor glycemic control 27 (44.3%) were overweight, 30 (49.2%) subjects had 4–6 years duration of diabetes mellitus, 33 (54.1%) with too high recent blood glucose values, 38(62.3%) subjects with co-morbidity of hypertension, 20 (32.8%) renal disease, 22 (36.1%) undergone steroid therapy, 15 (24.6%) subjects had 1–2 times hospitalization with hyperglycemia, 22 (36.1%) of subjects taken OHA and insulin as a treatment, and subjects 28 (54.1%) self-monitor blood glucose at home.

Table 4 interprets that 24 (61.5%) subjects who had always followed diabetic diet, 30 (76.9%) of subjects with normal appetite, 24 (61.5%) subjects no weight change in past 1 year, 18 (46.2%) subjects did exercise always, 30 (76.9%) always had sound sleep for 8 h in a day, 35 (89.7%) never consumed alcohol, and 38 (97.4%) never had cigarette smoking had good glycemic control. In contrast, subjects with poor glycemic control 23 (37.7%) had poor appetite, 25 (41.0%) lost weight, 26 (42.6%) had never performed exercise, 26 (42.6%) never had good sleep, and 18 (29.5%) subjects sometimes had cigarette smoking.

Section-II

Table 5 shows frequency and percentage distribution of complications related to diabetes mellitus between poor and good glycemic control among type 2 diabetes mellitus patients**.** Table interpreted that subjects with good glycemic control had retinopathy 2 (5.1%), nephropathy 1 (2.6%), 3 (7.7%) stroke and cataract whereas subjects with poor glycemic control had 10 (16.4%) retinopathy and nephropathy, 23 (37.7%) had neuropathy, 4(6.6%) had coronary artery disease, 8 (13.1%) had foot ulcer, 3 (4.9%) had undergone amputation, and 15 (24.6%) had stroke and 5 (8.2%) had cataract.

Section-III

Table 6 shows relationship between poor and good glycemic control among type 2 diabetes mellitus patients and diabetes related complications**.** The result revealed that subjects with poor glycemic control had more complications such as cataract (OR: 1.07, CI: 0.24–4.75), nephropathy (OR: 7.45, CI: 0.91–60.73), neuropathy (OR: 48.22, CI: 2.828–82.15), CAD (OR: 6.18, CI: 0.323–18.09), foot ulcer (0.703–23.97), stroke (OR: 3.913, CI: 1.051–14.56), amputation (OR: 4.726, CI: 0.237–94.04), and retinopathy (OR: 3.627, CI: 0.750–17.54) as compared to subjects with good glycemic control.

Section-IV

Table 7 shows the association of poor and good glycemic control among type 2 diabetes mellitus patients with their selected demographic variables which were analyzed using Chi-square. The result reveals that demographic variables such as age, educational level, and source of information from health-care provider were found to have significant association at p value (<0.05 level of significance) with glycemic control. Sex, religion, marital status, area of residence, dietary habits, family income, occupation, family history of DM, and health insurance were not significant with glycemic control [Table 7].

Table 1: Frequency and percentage distribution of Socio-Demographic factors between poor and good glycemic control among type 2 diabetes mellitus patients (*n*=100)

Socio-demographic factors	Good glycemic control *n*=39		Poor glycemic control *n*=61	
	f	%	f	%
Age in years				
30–39	9	23.1	7	11.5
40–49	20	51.3	14	23.0
50–59	10	25.6	18	29.5
60–69	0	0	12	19.6
Above 69	0	0	10	16.4
Sex				
Male	22	56.4	36	59.0
Female	17	43.6	25	41.0
Religion				
Sikh	21	53.8	43	70.5
Hindu	14	35.9	10	16.4
Christian	4	10.3	8	13.1
Marital status				
Married	38	97.4	50	81.9
Widow	0	0	2	3.3
Widower	1	2.6	9	14.8
Area of residence				
Urban	19	48.7	28	45.9
Rural	20	51.3	33	54.1
Educational level				
Informal education	3	7.7	30	49.1
Primary/secondary	26	66.7	27	44.3
Diploma	2	5.1	3	4.9
UG education	8	20.5	1	1.6
Dietary habits				
Vegetarian	22	56.4	30	49.2
Non-vegetarian	10	25.6	26	42.6
Eggetarian	7	18.0	5	8.2
Family income per month (Rs)				
Less than 20001	0	0	11	18.0
20001–40000	20	51.3	21	34.4
40001–60000	16	41.0	29	47.6
Above 60,0001	3	7.7	0	0
Occupation				
Unemployed	4	10.3	22	36.0
Self employed	17	43.6	24	39.3
Government employee	8	20.5	4	6.6
Private employee	10	25.6	9	14.8
Retired	0	0	2	3.3
Family history of DM				
First degree relatives	18	46.2	27	44.3
Second degree relatives	7	17.9	12	19.6
No family history	8	20.5	8	13.1
Don't know	6	15.4	14	23.0
Any health insurance fund				
Yes	3	7.7	2	3.3
No	36	92.3	59	96.7
Source of information about DM (multiple options)				
Electronic	Yes	No	Yes	No	Yes	No	Yes	No
	13	26	33.3	66.7	13	48	21.3	78.6
Printed	Yes	No	Yes	No	Yes	No	Yes	No
	6	33	15.4	84.6	4	57	6.6	93.4
Healthcare provider	Yes	No	Yes	No	Yes	No	Yes	No
	37	2	94.9	5.1	22	39	36.1	63.9
Relatives and friends	Yes	No	Yes	No	Yes	No	Yes	No
	26	13	66.7	33.3	40	21	65.6	34.4

Table 8 shows the association of poor and good glycemic control among type 2 diabetes mellitus patients with clinical factor and reveals that BMI, duration of diabetes mellitus, recent blood glucose level, co-morbidity with diabetes mellitus, undergone steroid therapy, hospitalization with hyperglycemia, experience with hypoglycemia, treatment, insulin injection

Table 2: Frequency and percentage distribution of poor and good glycemic control among type 2 diabetes mellitus patients (*n*=100)

Categories	Frequency	Percentage
Good	39	39
Poor	61	61

Table 3: Frequency and percentage distribution of clinical factors between poor and good glycemic control among type 2 diabetes mellitus patients (*n*=100)

Clinical factors	Good glycemic control *n*=39		Poor glycemic control *n*=61	
	f	%	f	%
BMI				
Normal weight	23	59	4	6.6
Over weight	16	41	27	44.3
Obesity class I	0	0	17	27.8
Obesity class II	0	0	13	21.3
Duration of DM				
≤3 years	18	46.2	7	11.5
4–6 years	18	46.2	30	49.2
7–9 years	3	7.6	15	24.6
≥10 years	0	0	9	14.7
Recent blood glucose level				
70–90 - Low	0	0	0	0
90–120 - Normal	12	30.7	7	11.5
120–160 - Medium	26	66.7	21	34.4
160–240 - Too High	1	2.6	33	54.1
Co-morbidity with DM (multiple options)				
Hypertension	5	12.8	38	62.3
Cancer	1	2.6	12	19.7
Depression	0	0	4	10.3
Renal disease	1	2.6	20	32.8
Endocrine disease	2	5.2	15	24.6
Undergone steroid therapy				
Yes	6	15.4	22	36.1
No	33	84.6	39	63.9
Have hospitalized in past 1 year with hyperglycemia				
No hospitalization	39	100	46	75.4
1–2 times	0	0	15	24.6
>2 times	0	0	0	0
Have experienced hypoglycemia in past 1 year				
No	39	100	57	93.4
1–2 times	0	0	4	6.6
>2 times	0	0	0	0
Type of treatment for DM				
Oral glycemic agents	39	100	39	63.9
Insulin only	0	0	0	0
a+b	0	0	22	36.1
Insulin injection per day				
Never	39	100	39	63.9
One time a day	0	0	13	21.3
Two times a day	0	0	4	6.6
Three/more times a day	0	0	5	8.2
Self-monitoring of blood glucose at home				
Yes	27	69.2	28	45.9
No	12	30.8	33	54.1

per day, and self-monitoring of blood glucose had significant association at *p* value (<0.05 level of significance) with glycemic control.

Table 4: Frequency and percentage distribution of behavioral factors between poor and good glycemic control among type 2 diabetes mellitus patients (*n*=100)

Behavioral factors	Good glycemic control *n*=39		Poor glycemic control *n*=61	
	f	%	f	%
Following diabetic diet				
Always	24	61.5	20	32.7
Sometimes	14	35.9	37	60.7
Never	1	2.6	4	6.6
Describe appetite				
Too much	7	17.9	14	23.0
Normal	30	76.9	24	39.3
Poor	2	5.2	23	37.7
Weight changed in past year				
No change	24	61.5	22	36.0
Gained weight	1	2.6	14	23.0
Lost weight	14	35.9	25	41.0
Exercise at least 20 min per day in a week				
Always	18	46.2	0	0
Sometimes	21	53.8	35	57.4
Never	0	0	26	42.6
Sound sleep for 8 h in a day				
Always	30	76.9	0	0
Sometimes	9	23.1	35	57.4
Never	0	0	26	42.6
Consume alcohol				
Always	1	2.6	11	18.0
Sometimes	3	7.7	26	42.6
Never	35	89.7	24	39.4
Cigarette smoking				
Always	0	0	1	1.6
Sometimes	1	2.6	18	29.5
Never	38	97.4	42	68.9

Table 5: Frequency and percentage distribution of complications related to diabetes mellitus between poor and good glycemic control among type 2 diabetes mellitus patients (*n*=100)

Complications (Multiple options)	Good glycemic control *n*=39		Poor glycemic control *n*=61	
	f	%	f	%
Peripheral Neuropathy	0	0	23	37.7
Stroke	3	7.7	15	24.6
Retinopathy	2	5.1	10	16.4
Nephropathy	1	2.6	10	16.4
Foot ulcer	0	0	8	13.1
Cataract	3	7.7	5	8.2
Coronary artery disease	0	0	4	6.6
Undergone Amputation	0	0	3	4.9

Table 9 shows the association of poor and good glycemic control among type 2 diabetes mellitus patients with behavior factors and reveals that following diabetic diet, appetite, weight changed in past year, exercise at least 20 min/day a week, sound sleep for 8 h, alcohol consumption, and cigarette smoking had significant association at *p* value (< 0.05 level of significance) with glycemic control [Table 8].

Table 6: Relationship between poor and good glycemic control among type 2 diabetes mellitus patients and their diabetes related complications (*n*=100)

Complications	Poor *n*=61	Good *n*=39	Odd Ratio	*p* value	Class interval
Cataract					
Yes	5	3	1.07	0.927	0.24–4.76
No	56	36			
Nephropathy					
Yes	10	1	7.45	0.060	0.91–60.73
No	51	38			
Neuropathy					
Yes	23	0	48.22	0.007	2.828–82.15
No	38	39			
Coronary artery disease					
Yes	4	0	6.18	0.226	0.323–18.09
No	57	39			
Foot ulcer					
Yes	8	0	12.55	0.085	0.703–23.97
No	53	39			
Stroke					
Yes	15	3	3.913	0.041	1.051–14.56
No	46	36			
Amputation					
Yes	3	0	4.726	0.308	0.237–94.04
No	58	39			
Retinopathy					
Yes	10	2	3.627	0.109	0.750–17.54
No	51	37			

Discussion

Studies supporting the research findings

Section 1: Major findings related to socio demographic characteristics of patients with type 2 diabetes mellitus

The present study shows that (34%) of subjects were belongs to age group of 40–49 years, one fourth (28%) were age group of 50–59 years, 16% were in age group of 30–39 years, 12% were in 60–69 years, and only 10% belong to age of above 69 years. More than half (58%) of subjects were male and 42% were female.

Similar study a cross-sectional study was conducted to estimate the prevalence of diabetes mellitus and associated factors in a sample of adult population in a peri-urban area of West Tripura. Results showed that the mean age of the study participants was 42.21 ± 17.65 years, comprised of 23.7% male and 76.3% female. Diabetes was found highest in 39–58-year age group (37.5%). Males were more affected with diabetes mellitus (22.2%) compared to females (15.5%).[5]

Section 2: Major findings related to clinical and behavioral factors of patients with type 2 diabetes mellitus

The present study shows that 100 of total subjects of type 2 diabetes mellitus 61% of subjects had poor glycemic control and 39% had good glycemic control. BMI of poor glycemic control subjects 27 (44.3) were overweight, 17 (27.9%) were obesity Class I. Majority of subjects (95%) had no health insurance. Out of 61 only 22 (36.1%) patients of poor glycemic control taken diet, exercise, and oral glycemic agents as a treatment.

Similar study was carried out at the diabetic clinics for T2DM patients at the national and municipal hospitals and results showed that 69.7% had FBG of ≥7.2 mmol/L, indicating poor glycemic control. Factors associated with poor glycemic control included lack of health insurance, obesity, and non-adherence to diabetic medications.[6]

Section 3: Major finding related to complication among type 2 diabetes mellitus patients

According to recent study complications related to diabetes mellitus of subjects with poor glycemic control had 10 (16.4%) retinopathy and nephropathy, 23 (37.7%) had neuropathy, 4 (6.6%) had coronary artery disease, 8 (13.1%) had foot ulcer, 3 (4.9%) had undergone amputation, 15 (24.6%) had stroke, and 5 (8.2%) had cataract.

Similar study was carried out to determine current glycemic status and diabetes related complications among type 2 diabetes patients. Results showed that neuropathy was the most common complication followed by cardiovascular (23.6%), renal (21.1%), and eye (16.6%) complications. The prevalence of foot ulcer was 5.1%. Many patients had multiple complications.[7]

Section 4: Study supporting association of poor and good glycemic control with socio demographic, clinical, behavior factors, and diabetes related complications

The present study result revealed that demographic factors such as age, educational level and source of information from health-care provider was found to have significant association at *p* value (<0.05 level of significance) with glycemic control.

Clinical variables such as BMI, duration of diabetes mellitus, recent blood glucose level, co-morbidity with diabetes mellitus, undergone steroid therapy, hospitalization with hyperglycemia, experience with hypoglycemia, treatment, insulin injection per day, and self-monitoring of blood glucose had significant association at *p* value (<0.05 level of significance) with glycemic control.

Behavior variables such as diabetic diet, appetite, weight changed in past year, exercise at least 20 min/day a week, sound sleep for 8 h, alcohol consumption, cigarette smoking had significant association at *p* value (< 0.05 level of significance) with glycemic control.

Similar study had carried out a study to evaluate the relationship between poor glycemic control and metabolic parameters, individual life and complications. Poor glycemic control was found significantly associated with duration of diabetes, age, educational status, anti-diabetic drugs, body mass index, hypertension, and fasting plasma glucose levels. There was a significant relationship between the glycemic control and dietary compliance, physical activity, self-blood glucose monitoring, and drug compliance. While, there was a significant relationship between the poor glycemic control and nephropathy, retinopathy, neuropathy, and cardiovascular diseases.[8]

Table 7: Association of poor and good glycemic control among type 2 diabetes mellitus patients with their selected socio- demographic factors (*n*=100)

Socio-demographic factors	Good *n*=39	Poor *n*=61	Chi-value df *p* value
Age in years			
30–39	9	7	21.81
40–49	20	14	4
50–59	10	18	0.001*
60–69	0	12	
Above 69	0	10	
Sex			0.066
Male	22	36	1
Female	17	25	0.797^{NS}
Religion			
Sikh	21	43	4.963
Hindu	14	10	2
Christian	4	8	0.084 ^{NS}
Marital status			
Married	38	50	5.461
Widow	0	2	2
Widower	1	9	0.065 ^{NS}
Area of residence			0.076
Urban	19	28	1
Rural	20	33	0.783 ^{NS}
Educational level			
Informal education	3	30	24.223
Primary/secondary	26	27	6
Diploma	2	3	0.000*
UG education	8	1	
Dietary habits			
Vegetarian	22	30	6.940
Non-vegetarian	10	26	3
Eggetarian	7	5	0.074^{NS}
Family income per month (Rs)			
Less than 20001	0	11	14.710
20001–40000	20	21	5
40001–60000	16	29	0.012^{NS}
Above 60,0001	3	0	
Occupation			
Unemployed	4	22	12.823
Self employed	17	17	4
Government employee	8	4	0.012^{NS}
Private employee	10	9	
Retired	0	2	
Family history of DM			
First degree relatives	18	27	1.924
Second degree relatives	7	12	4
No family history	8	8	0.750^{NS}
Don't know	6	14	
Any health insurance fund			
Yes	3	2	0.976
No	36	59	1
			0.323^{NS}
Source of information about DM (multiple options)			
Electronic	Yes 13 / No 26	Yes 13 / No 48	3.053 1 0.081^{NS}
Printed	Yes 6 / No 33	Yes 4 / No 57	2.060 1 0.151^{NS}
Healthcare provider	Yes 37 / No 2	Yes 22 / No 39	34.010 1 0.000*
Relatives and friends	Yes 26 / No 13	Yes 40 / No 21	0.013 1 0.910^{NS}

Table 8: Association of poor and good glycemic control among type 2 Diabetes Mellitus patients with clinical factors (*n*=100)

Clinical factors	Glycemic control		Chi-value
	Good	Poor	df
	n=39	*n*=61	*p* value
BMI			
Normal weight	23	4	43.44
Over weight	16	27	3
Obesity class I	0	17	0.001*
Obesity class II	0	13	
Duration of DM			
≤3 years	18	7	21.01
4–6 years	18	30	3
7–9 years	3	15	0.001*
≥10 years	0	9	
Recent blood glucose level			
90–120 Normal	12	7	28.50
120–160 Medium	26	21	2
160–240 Too High	1	33	0.000*
Co-morbidity - Hypertension (multiple options)			23.75
Yes	5	38	1
No	34	23	0.001*
Cancer			
Yes	1	12	6.156
No	38	49	1
			0.013*
Depression			
Yes	4	0	6.517
No	35	61	1
			0.011*
Renal disease			
Yes	1	20	13.09
No	38	41	1
			0.001*
Endocrine disease			
Yes	2	15	7.134
No	37	46	1
			0.03*
Steroid therapy			
Yes	6	22	5.047
No	33	39	1
			0.025*
Hospitalized for hyperglycemia in past 1 year			
No hospitalization	39	46	11.28
1–2 times	0	15	1
			0.001*
Experienced hypoglycemia in past 1 year			
No	39	57	2.664
1–2 times	0	4	1
			0.103 NS
Type of treatment for DM			
Oral glycemic agents	39	39	40.87
Insulin only	0	0	3
a+b	0	22	0.001*
Insulin injection per day			
Never	39	39	16.99
One time a day	0	13	3
Two times a day	0	4	0.001*
Three/more times a day	0	5	
Self-monitoring of blood glucose at home			
Yes	27	28	5.231
No	12	33	1
			0.022*

Table 9: Association of poor and good glycemic control among type 2 diabetes mellitus patients with behavior factors (*n*=100)

Behavioral factors	Glycemic control		Chi-value
	Good	Poor	df
	n=39	*n*=61	*p* value
Following your diabetic diet			
Always	24	20	7.088
Sometimes	14	37	2
Never	1	4	0.018*
Describe your appetite			
Too much	7	14	17.90
Normal	30	23	2
Poor	2	24	0.001*
Weight changed in past year			
No change	24	22	10.10
Gained weight	1	14	2
Lost weight	14	25	0.006*
Exercise atleast 20 mins per day a week			
Always	18	0	44.83
Sometimes	21	35	2
Never	0	26	0.001*
Sound sleep for at least 8 h in a day			
Always	30	22	18.74
Sometimes	8	39	2
Never	1	0	0.001*
Consumption of alcohol			
Always	1	11	24.99
Sometimes	3	26	2
Never	35	24	0.001*
Cigarette smoking			
Always	0	1	14.99
Sometimes	0	18	2
Never	39	42	0.001*

Conclusion

The study findings concluded that diabetes is a disease which is affected by several factors such as socio-demographic (age and educational level), clinical (BMI and duration) and behavior factors (self-monitoring, treatment). Patients should be screened every 3 months for HbA1c level and health-care providers should providing necessary recommendation for optimal glycemic control.

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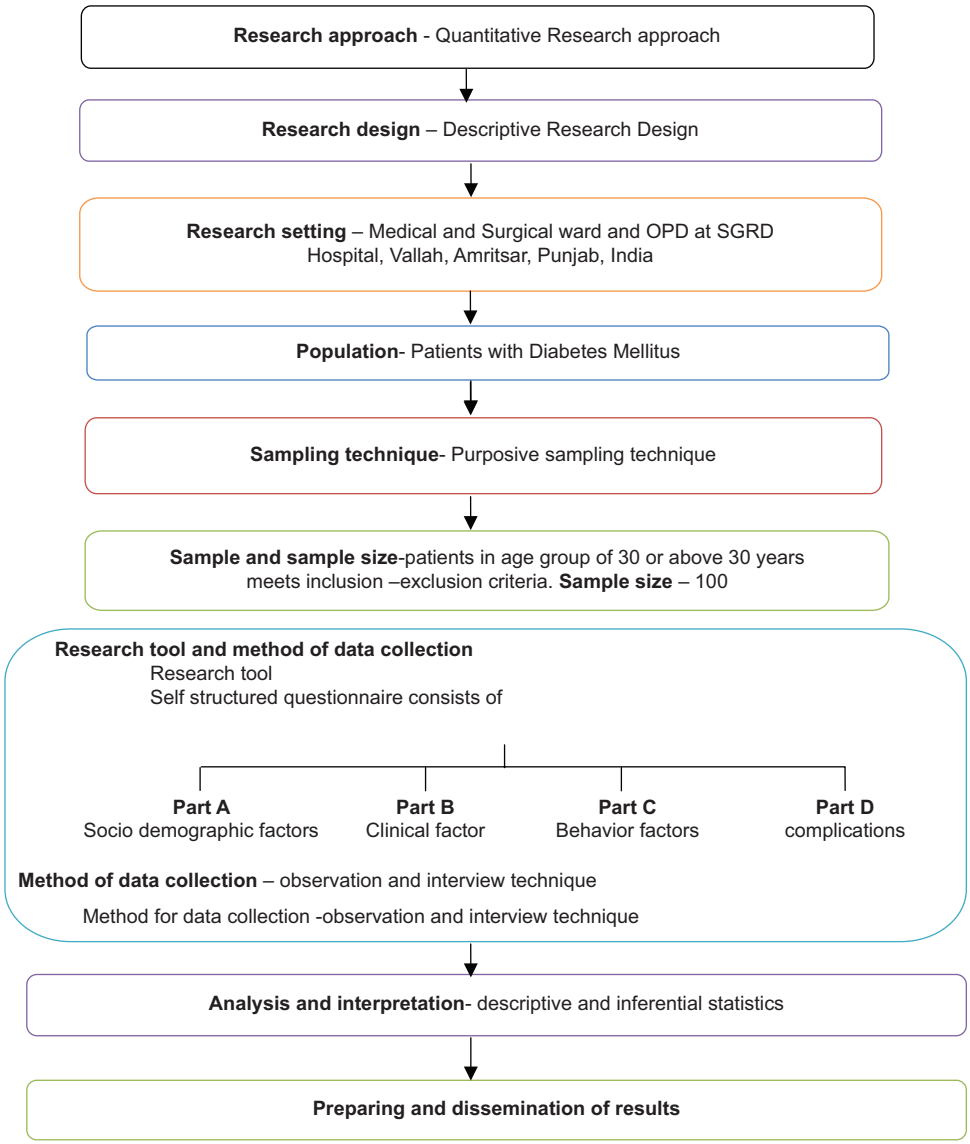

Figure 1: Schematic representation of research methodology

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Conflict of Interest

None.

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