Explore the Relationship between Impulse Control, Diabetes Specific Self- Efficacy and Diabetes Management among Young Adults with Diabetes Mellitus

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ABSTRACT

Introduction: Diabetes Mellitus is one of most commonly accepted diseases in Indian society affecting one in four adults. Diabetes is a group of diseases that results increase in the level of sugar in the blood. Diabetes is no more an old age disease[1]. Currently adults just above 20 years of age are reported with this menace disrupting the daily life and Health.

Objective: The aim of the study was to explore the relationship among impulse control, diabetes specific self- efficacy and diabetes management among young adults with Diabetes Mellitus.

Methods: Cross sectional Research design was used with a sample of 91 young adults selected by convenient sampling technique at Tulsigirish Diabetic care hospital in Bagalkot District, Karnataka. Data collection was done with 4 instruments: Structured questionnaire to assess socio demographic profile, Self control scale, Diabetes specific self efficacy scale and Diabetes self management questionnaire scale. The sample size was calculated using G-Power 3.1.9.4 software.

Results: The Mean age of sample was 30.27 ± 6.479 years with the minimum age; 18 years and maximum age; 40 years. The mean Duration of DM among sample was 24.90 ± 25.9 months The Mean Impulse control scores was 37.55 ± 5.576 with the minimum score 10 and maximum score 50. The Mean self efficacy score was 50.93 ± 10 and the Mean Diabetes self management score was 25.45 ± 4.382. The mean Dietary control score was 7.43 ± 2.011. The mean Medical Adherence score was 3.74 ± 1.315. The mean Blood Glucose Monitoring score was 4.27 ± 2.289. The mean Physical Activity score was 3.83 ± 1.969. The mean Physician Contact score was 5.56 ± 1.3013. The mean overall DSM score was 0.64 ± 0.753. A significant association was found between impulse control and Diabetes management. A significant association was found between Educational status ($X^2=8.954$, $P<0.05$), Marital status($X^2=6.614$, $P<0.05$), Habit of consuming alcohol ($X^2=9.291$, $P<0.05$) and Diabetes Management among Young adults.

Conclusion: The findings revealed that respondents had Good Impulse control, Average Diabetes self efficacy and Average Diabetes self management among young adults with Diabetes Mellitus.

Key words: Young adults, Impulse control, Diabetes specific self efficacy, Diabetes self management.

INTRODUCTION

Diabetes not only disrupts the physical and physiological health but also devastates mental well being and quality of life of the sufferer. Adhering to WHO definition of health, a person can be considered healthy not merely in the absence of disease. A person with diabetes can be healthy with appropriate management and keeping the blood sugar levels with normal range[1].

India has an estimated 77 million people with diabetes, a country that is already facing challenges such as malnutrition, poverty and socioeconomic burden caused by communicable diseases. The main risk factors for the high prevalence of diabetes include high familial aggregation, obesity, insulin resistance and metabolic syndrome, lifestyle changes such as increased consumption of saturated fats, sugars and sedentary behavior as a result of urbanization, and gestational diabetes[2].

Diabetes Mellitus is a condition with chronically increased blood sugar level as result of inability of pancreas in maintaining blood sugar level. In certain autoimmune condition the immune system attacks and destroys cells in the pancreas. Type 1 DM is a result of autoimmune disease[2].

DM is a chronic disease, once acquired it remains throughout life. Hence the best strategy to lead a good quality life is to maintain the blood sugar level in its optimum range. This maintenance needs an appropriate and strict adherence to treatment regimen. But adherence needs balance of many psychological aspects like impulse control, self efficacy, good sleep etc [2].

According to IDF Diabetes Atlas ninth edition-Diabetes is one among the fastest growing health challenges of 21st century with the number of adults living with diabetes having more than tripled over past 20 years[3].

According to WHO Impulse control is a condition in which a person has trouble controlling emotions or behaviors and often the behaviors violate the rights of others or conflict with societal norms and the law[4].

Self-efficacy is defined as the ability of individual to perform an action successfully or her/his perception of being able to control events. Self-efficacy impacts compliance with treatment and, therefore, plays a role in the clinical outcome. Increase in the self-efficacy of the individual increases the compliance with the recommended treatment in chronic disease. It also reflects one's ability to adopt behavioral changes for better self-care abilities. Therefore, evaluation of self-efficacy of the diabetic individuals helps in the selection of suitable self-care interventions[5].

The prevalence of type 2 diabetes in adolescents and young adults is dramatically increasing. The major predisposing risk factors are obesity, family history, and sedentary lifestyle. Onset of diabetes at a younger age (defined here as up to age 40 years) is associated with longer disease exposure and increased risk for complications. Young-onset type 2 diabetes also affects more individuals of working age, accentuating the adverse societal effects of the disease. Furthermore, a more aggressive disease phenotype, leading to premature development of complications, with adverse effects on quality of life and unfavorable effects on long-term outcomes, raising the possibility of a future public health catastrophe[6].

Karnataka is at 6th place with a prevalence of 7.5% Diabetes in India. But it is among the top three when it comes Tamil Nadu (10.4%) in diabetes prevalence because people in north Karnataka consume coarse cereals a lot unlike Tamil Nadu where rice is the staple diet. But the huge number of pre-diabetic population is a big risk as little change in lifestyle can be made. In Bangalore, 14% and 21% people are suffering from diabetes and high blood pressure[7].

According to IDF Diabetes Atlas 9th Edition-Approximately 463 million adults (20-79 years) were living with diabetes; by 2045 this will rise to 700 million. The proportion of people with type 2 diabetes is increasing in most countries. 79% of adults with diabetes were living in low-and middle-income countries. More than 1.1 million children and adolescents are living with type 1 diabetes. More than 20 million live births (1 in 6 live births) are affected by diabetes during pregnancy. 374 million people are at increased risk of developing type 2 diabetes[3].

India has an estimated 77 million people with diabetes, which makes it the

second most affected in the world, after China. One in six people (17%) in the world with diabetes is from India. (India's population as calculated in October 2018 was about 17.5% of the global total.) The number is projected to grow by 2045 to become 134 million as per the International Diabetes Federation[8].

In 2020, according to the International Diabetes Federation (IDF), 463 million people have diabetes in the world and 88 million people in the Southeast Asia region. Of this 88 million people,77 million belong to India. The prevalence of diabetes in the population is 8.9%, according to the IDF. According to the IDF estimates, India has the second highest number of children with type 1 diabetes after the United States. It also contributes to the largest proportion of incident cases of type 1 diabetes in children in the SEA region. Per the World Health Organization, 2% of all deaths in India are due to diabetes[8].

Young adults with Diabetes mellitus portray a greater risk as they have to live for long time with this menace. Diabetes and diabetic retinopathy have been emerging as a significant non-communicable disease leading to ocular morbidity. It is estimated that diabetic retinopathy was responsible for 1.06% of blindness and 1.16% of visual impairment globally in 2015[9].

MATERIALS AND METHODS

Study design: It is a Cross sectional Research design conducted at Tulsigirish Diabetic care hospital in Bagalkot, Karnataka.

Setting of the study: The study was conducted at Tulsigirish Diabetic care Centre in Bagalkot Karnataka. It is a 50 bedded Diabetic care hospital. The recruitment and data collection of participants was carried out in outpatient department.

Participants: The study participants were young adults with Diabetes Mellitus attending OPD of Tulsigirish Diabetic

centre Bagalkot. 100 young adults were enrolled for the study. Data of 9 subjects was found incomplete hence; the final sample included in the study was 91.

Criteria for sample selection:
Inclusion criteria: The study includes young adults who are:
1. Diagnosed with diabetes management at least 6 months before enrollment in the study.
2. Able to understand/read/ write Kannada or English.
3. Available at the time of data collection.
4. Willing to participate in the study.

Exclusion criteria: The study excludes the young adults who are:
1. Not in a health condition to communicate due to any other co-morbidity.
2. Expected to be out of study area at the time of data collection.
3. Mentally challenged and not able to provide data.
4. Enrolled in any other research study as sample that affects the management of Diabetes mellitus.

Sample Size estimation: sample size was estimated using G-Power 3.1.9.4 software considering the following criteria; α=5% (0.05), Effect size=0.15 and Power of the test=80% (0.80). The calculation was done considering linear multiple regression fixed model, with a number of predictors=2, power (1-B error prob)= 0.95.The calculated sample size was 90, considering the possibility of attritions in the final data the researcher enrolled 100 young adults with DM from OPD, Tulsigirish Diabetic hospital, Bagalkot, as sample. The data collection was done for 100 subjects. 9 subjects had incomplete data hence for final analysis data of 91 young adults was considered.

Description of data collection tools
The data collection instruments were divided into 4 sections-

Section 1- Baseline proforma

It is a structured proforma consisting15 items regarding baseline data of the subjects.

Scoring/The collected information was coded as follows for data analysis-

Section 2: Impulse control scale/ self-control scale: It consists of 10 items. The self-control scale aims to assess people's ability to control their impulses, after their emotions, and thoughts.

Scoring –

where scoring pattern was 1to5;1= very much like me,2=mostly like me,3=somewhat like me,4=a little like meand5= not at all like me.

The possible score range was 10- 50. Participant's responses were summed, with higher scores on the tool were better self-controlling. The total Self control scale scores were classified into following categories: 0-10 (very Poor), 11 to 20 (poor) and 21-30 (average), 31-40 (good), 41-50 (excellent).

Section 3: Diabetes specific self-efficacy scale:

It is an 8 items scale designed to measure youth's perceived confidence in one's ability to perform self care.

Scoring –

Where scoring pattern was 1 to 10, 1= not at all confident, 10= totally confident.

The possible score range was 8-80. Participant's responses were summed, with higher scores on the tool were demonstrating better self-management. The total DSSE scores were classified into following categories :< 30 (Poor), 31-60 (average) and >60 (Good).

Section 4: Diabetes self-management questionnaire scale (DSMQ):

This scale targets diabetes self-care and assess the behavior control and treatment regimens for Diabetes Mellitus in young adults. It consists of 4 components which include a total of 16items, out of that 5 items on management of glucose, 3 items on physical activity, 4items on dietary control, 3 items on health-care and one item on overall rating on self-care i.e. sum scale.

Scoring –

Where, scoring pattern was0to3; 3=Applies to me very much, 2=Applies to me to a considerable degree, 1=Applies to me to some degree and 0 =Does not apply to me.

The possible score range was 0-48. Participant's responses were summed, with higher scores on the tool were demonstrating better self-management. The total DSMQ scores were classified into following categories: 0-16(Poor), 17-32 (Average) and 33-48 (Good).

Data Collection

Data collection was done from 16/03/2021 to 15/05/2021 among 100 young adults with Diabetes mellitus.

Variables of the study
Statistical Analysis

The data was analyzed using SPSS statistical package 28. Repeated measure two way ANOVA and Multiple linear regression analysis were used to determine the association between impulse control, Diabetes specific self efficacy, and Diabetes Management among young adults with diabetes mellitus. Non adjusted odds ratio with 95% Confidence interval was used to establish the level of association. Spearman rank order correlation was used to determine Correlation between Impulse control and diabetes specific self efficacy. Chi square test was used to determine the association between socio demographic factors and Diabetes management.

Ethical Consideration

Ethical clearance certificate was obtained from B.V.V.S Sajjalashree Institute of Nursing Sciences, institutional ethical committee. Written consent was obtained from each participant.

RESULTS

Table No 1: Description of sample according to Age, Duration of DM and Family monthly income N=91

SD Factors	Mean	Standard Deviation	Minimum value	Maximum value
Age in years	30.27	6.479	18	40
Duration of DM in months	24.90	25.935	8	192
Family Monthly Income in Rupees	13,450.55	6,168.493	5,000	35,000

Table no 2: Description of Impulse control, diabetes self efficacy and Diabetes self management scores of young adults N=91

Characteristics	Mean	Standard Deviation	Minimum value	Maximum Value
Impulse control	37.55	5.576	10	50
Diabetes specific self efficacy	50.93	10.037	8	80
Diabetes self management	25.45	4.382	00	48

The impulse control among sample is further divided; 7 (7.7%) respondents had Average self control and 54 (59.3%) respondents had Good self control and 30 (33%) respondents had excellent self control. None of the respondents had very poor or poor self control.

Most of the subjects, 79 (86.8%) had Average level of DSSE, Whereas 8 (8.8%) respondents had Good and 4 (4.4%) respondents had poor level of DSSE.

Most of the subjects, 86 (94.5%) had Average level of DSM. Whereas 4 (4.4%) respondents had Good and 1 (1.1%) respondents had poor level of DSM.

Domain wise Mean and SD of Diabetes self management; the mean and SD of Dietary control score was 7.43±2.011 with the Maximum score was 12 and Minimum score was 0. The mean and SD of Medical Adherence score was 3.74 ±1.315 with the Maximum score was 6 and Minimum score was 0. The mean and SD of Blood Glucose Monitoring score was 4.27±2.289 with the Maximum score was 9 and Minimum score was 0. The mean and SD of Physical Activity score was 3.83±1.969 with the Maximum score was 9 and Minimum score was 0. The mean and SD of Physician Contact score was 5.56±1.3013 with the Maximum score was 9 and Minimum score was 0. The mean and SD of overall DSM score was 0.64 ±0.753 with the Maximum score was 3 and Minimum score was 0.

Table No 3: Association between Impulse control and Diabetes self management among young adults.   N=91

Domains of DSMQ	R square	sum of square	DF	Mean square	F (t) value	P value (sig)
Dietary control	.110	39.999	1	39.999	10.978	.001
		324.287	89	3.644		
Medical adherence	.052	8.060	1	8.060	4.860	.030
		147.610	89	1.659		
Blood Glucose Monitoring	.112	53.017	1	53.017	11.271	.001
		418.654	89	4.704		
Physical activity	.140	48.974	1	48.974	14.519	<.001
		300.213	89	3.373		
Physician contact	.109	16.668	1	16.668	10.928	.001
		135.749	89	1.525		
Overall	.013	.657	1	.657	1.160	.284
		50.376	89	.566		

Multiple Linear Regression Analysis was conducted to find the association between Impulse control and Diabetes self management among young adults with Diabetes mellitus. A significant association was found between impulse control with dietary control (F=10.978, P<0.05), Medical adherence (F=4.860, P<0.05), Blood Glucose Monitoring (F=11.271, P<0.05), Physical activity (F=14.519, P<0.05), Physician contact (F=10.928, P<0.05) by No significant association was found between overall DSMQ.

Diabetes specific self efficacy and Diabetes self management among young adults with Diabetes mellitus. A significant association was found between Diabetes self efficacy with Physical activity (F=18.730,

P<0.05) but No significant association was found between Dietary control, Blood Glucose Monitoring, Physician contact, Overall DSMQ.

Table No 4: Association between Diabetes specific self efficacy and Diabetes self management among young adults   N=91

Domains of DSMQ	R square	sum of square	df	Mean square	F (t) value	P value (sig)
Dietary control	.002	.749	1	.749	.183	.669
		363.536	89	4.085		
Medical adherence	.002	.250	1	.250	.143	.706
		155.421	89	1.746		
Blood Glucose Monitoring	.004	1.909	1	1.909	.362	.549
		469.761	89	5.278		
Physical activity	.174	60.709	1	60.709	18.730	<.001
		288.478	89	3.241		
Physician contact	.001	.191	1	.191	.112	.739
		152.226	89	1.710		
Overall	.001	.048	1	.048	.083	.773
		50.985	89	.573		

Table No 5: Odds Ratio between Impulse Control and Domain Wise DSMQ   N=91

Impulse control	P Value	95% Confidence Interval	
		Lower	Upper
Dietary control	2.245	.906	5.563
Medical adherence	3.231	1.357	7.693
Blood glucose monitoring	.352	.147	.844
Physical activity	.323	.131	.796
Physician contact	6.525	1.755	24.256
Overall	.360	.091	1.428

For Dietary control the odds ratio was 2.245 with C.I 95% (Lower=0.90, Upper=5.56).For Medical adherence the odds ratio was 3.231with C.I 95% (Lower=1.35, Upper=7.69). For Blood glucose monitoring the odds ratio was 0.352 with C.I 95% (Lower=0.14, Upper=0.84). For Physical activity the odds ratio was 0.323 with C.I 95% (Lower=0.13, Upper=0.79). For Physician contact the odds ratio was 6.525 with C.I 95% (Lower=1.75, Upper=24.25). For Overall the odds ratio was 0.360 with C.I 95% (Lower=0.09, Upper=1.42).

Table No 6: Odds Ratio Score between DSSE and Domain Wise DSMQ   N=91

Diabetes self efficacy	P Value	95% Confidence Interval	
		Lower	Upper
Dietary control	.962	.297	3.109
Medical adherence	3.781	1.103	12.958
Blood glucose monitoring	1.151	.373	3.557
Physical activity	1.304	.406	4.194
Physician contact	.868	.219	3.433
Overall	.985	.193	5.029

For Dietary control the odds ratio was 0.962 with C.I 95% (Lower=0.297, Upper=3.109). For Medical adherence the odds ratio was 3.781 with C.I 95% (Lower=1.10, Upper=12.9). For Blood glucose monitoring the odds ratio was 1.151 with C.I 95% (Lower=0.373, Upper=3.557). For Physical activity the odds ratio was 1.304 with C.I 95% (Lower=0.406, Upper=4.19).For Physician contact the odds ratio was 0.868 with C.I 95% (Lower=0.219, Upper=3.43). For Overall the odds ratio was 0.985 with C.I 95% (Lower=0.19, Upper=5.029).

Limitations of the study: The study was limited to find the association between impulse control, Diabetes specific self efficacy and Diabetes self-management. Data was collected from only 91 subjects and the study was conducted in only one hospital.

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