ORIGINAL ARTICLE

Diabetes care scale: a first line screening of self-care and treatment behavior in diabetics seeking treatment at a tertiary care setting in Bhubaneswar, Odisha

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Abstract

Background: Quality in diabetic management is the need of the hour, in eye of the menacing increase in the disease in India. Hence, a sensitive qualitative handling of outpatient visits is warranted and an inbuilt mechanism of Quality of life scales (which are proxy of the patient's response to disease) and Diabetic care scales (proxy for patient's satisfaction to the care extended), would offer supportive evidence to physicians, of areas where they will have to be more careful. **Aims and Objectives:** To assess the Diabetic Care scale (DCS) for the subjects seeking management from the diabetic care unit. To find out the factors associated with the DCS and derive inferences to improve upon quality of management in the given sample **Methodology**: Diabetics were made to answer to Quality of Life in Diabetics (QOLID) and Diabetic Care Scale (DCS), validated and pretested for Indian populations; and factors affecting patient's responses were ascertained, to improve care. Final sample of 599 interviews were assessed. To identify the predictors of diabetic care, diabetic care scale was dichotomized on the basis of its median value. **Results**: QOLID domains were inversely correlated with DCS, strongly significant (treatment satisfaction, general health, symptom botherness, financial worries, emotional health and physical endurance). Role limitations to physical health were also positively related to DCS (-0.422; p<0.001), which indicated that this domain affected DCS positively and significantly. Overall QOLID and DCS scores were negatively correlated and significant (-0.650; p<0.005). Education (UOR 0.76; SD 0.64 - 0.90, p=0.002), treatment, medical adherence in diabetics about being careless with medications (AOR=2.38 SD 1.50 - 3.77, <0.001) emerged predictors of poor DCS scores. DCS can be used as a prelim screening to evaluate the quality of care in diabetic management in early stages so as to rectify any gaps and improve through specialized counselling in subsequent visits. Wide use of these tools is recommended, both in rural and urban scenario to improve and control the diabetic epidemic in India.

Introduction

India is bracing for a new era, wherein 73 million people are living with diabetes and another 37 million with pre diabetes while nearly 47% of the diabetes cases are undiagnosed. This clearly hints at need for self-care and health seeking behavior and the health care provider to devise and develop strategies to encourage both. (1,2,3)

Communication research in Non-communicable diseases like Diabetes have emphatically demonstrated the fact that many patient issues go unexplored and unattended in office visits, due to several factors including limited interaction, provider time management style, and patient discomfort raising issues with the provider, apprehending its lack of relevance. (4,5)

The use of Health-related Quality of Life questionnaires in Diabetic care is rife with its own limitations in Indian settings, wherein already the Doctor: patient ratio is high and these questionnaires which have 60 odd questions, offer a time challenge both for the health seeker as well as the health provider. The DQOL questionnaire developed for both type 1 and type 2 diabetes as part of the DCCT (4, 5, 6) has already been identified, as having qualities most amenable to aiding provider-patient communication about treatment.

A clinical inventory was validated (7) called the 15-item DQOL Brief Clinical Inventory, that provided a total health related quality of life score that predicted self-reported diabetes care behaviors and satisfaction with diabetes control as effectively as the full version of the instrument. In addition, it provided a medium for rapid screening patients for specific treatment-related concerns, taking not more than 15 to 20 minutes, but capturing core quality of life issues that may be missed in a typical patient provider interaction.

This exercise was done at a state of art diabetic care center at a tertiary setting in the capital of state Odisha, Bhubaneswar, a state with a 16% reporting of diabetic population in the country. As per a report (8,9), Odisha falls in the low Epidemiological transition level (ETL) for diabetes and change in the age-standardized DALY rate since 1990 to 2016 was generally the highest in states of low ETL. Thus, these states have the urgency to reinforce their strategies and offer optimized diabetic care and management to protect the populations from complications.

Kalinga Institute of Medical Sciences (KIMS) has a state of art diabetic care unit and the study was undertaken here to carry out an assessment of the patient's diabetic care using the DCS (Diabetic care scale) and understanding the factors associated with it.

Aims & Objectives

1. To assess the Diabetic Care scale (DCS) for the subjects seeking management from the diabetic care unit
2. To find out the factors associated with the DCS and derive inferences to improve upon quality of management in the given sample

Material & Methods

The study was conceived in the Diabetic state of art clinic of Kalinga Institute of Medical Sciences, in conjunction with Department of Community Medicine, as an effort to improve upon the management and seek patient satisfaction. The study ethical consent was obtained in December 2016 and has been an ongoing effort. The current article includes data from December 2019 to August 2020.

Consecutive diagnosed diabetics (currently diagnosed atleast over 1 month to 3 months), coming to the Outpatient department, irrespective of Type 1 or Type 2 diabetic, above 18 years of age, willing to participate and who is not suffering from debilitating or life-threatening complications of the disease, does not warrant admission to the hospital and answers all questions completely were the inclusion criteria for the study. Complicated end stage disease and non-compliant cases were excluded from the study.

Scales of QOLID (Quality of life in Diabetics) was used to asses quality of life (6,7), which was validated by Sitaram Bhartia Institute of Science and Research in a scientifically discrete two phase pattern to finalize a questionnaire with 34 items addressing eight domains: namely role limitations due physical Health, physical endurance, general health, treatment satisfaction, symptom frequency, financial worries, mental health, and diet advice satisfaction. The Final questionnaire had an Overall Cronbach's Alpha value of 0.894(subscale-0.55 to 0.85) showing high internal consistency, thus hinting at an appropriateness for use in the given population. A robust sample of 10 subject respondents per question would be adequate to generate a representative population (10), so a sample of 340 would be optimum and adding a 20% non-response rate, the optimum sample would be

408. With the given time duration of December 2019 to August 2020, a sample of 628 could be generated but 29 questionnaires were deleted due to incompleteness and hence the final sample for the study was 599. The QOLID data is published (6) that determines predictors of QOL of this sample population.

The tool of Diabetic care scale (11), free for use, was used to assess the given population for their diabetic self-behaviors and satisfaction with the disease control which was the outcome indicator for this article. This is a much-abridged scale, with 15 questions, scored on a likert scale of 1-5 ie from very satisfied to very dissatisfied and a higher score would hint at more dissatisfaction. For the current population, the median score of 35 was taken as cut off for satisfied and above 35 as dissatisfied. This can be a very simple 10-minute exercise that can be clubbed with QOL assessment, to find out gaps in personalized health and illness behaviors responses in patients in good time. The 15 items on this survey cover a broad range of issues related to diabetes. They range from satisfaction with various aspects of the diabetes regimen to fears and concerns to frequency of diabetes problems. These issues might not be uncovered during a typical clinical office visit and hence could be addressed either through tailoring of the regimen, providing information, or simply listening and providing reassurance to patients' concerns. In the nutshell an association of both scores can help improve diabetic management outcomes in a long way.

The survey questionnaire was filled by a team of trained counsellors, after the OPD session and has sections on socio-demographic details on the subject, anthropometry (weight in kg measured with a calibrated adult weighing scale, corrected to 0.1kg; height measured with a stapediometer stand, calibrated and standardized to detect height accurately to 0.1m and Body Mass Index calculated using Broca's index). Other patient specific details, like lab parameters, treatment, compliance to treatment and complications if any were also noted as per history and authenticated with the OPD and lab records.

Statistical analysis: All the quantitative variables were presented with mean and standard deviation and qualitative parameters are presented as numbers and percentages. Pearson correlation coefficient was used to find relationship between diabetic care scale and various domains of quality of life. To identify the predictors of diabetic care, diabetic care scale was dichotomized on the basis of its median value. Then step wise logistic regression analysis with forward selection as well as backward elimination with removal as well as inclusion probability of 5% was used to identify the independent predictors of diabetic care. All the variables which were significant under univariate analysis were candidate variable for multivariable analysis. All the results were interpreted at 5% level of significance and Stata 15.1, Statacorp, Texas was used for analysis.

Results

All the domains of quality of life except diet satisfaction and role limitation due to physical health, have significant negative correlation with diabetic care scales, dichotomized as good care for score values below 35 and bad care for 35 and above. It shows that persons having better quality of life are less dissatisfied (more satisfied) with diabetic care, which is highly significant for all domains. Diet restrictions in diabetics, affects the quality of life as well as rates of dissatisfaction with the diabetic care are high. This reinforces the role of dieticians to plan a diabetic diet that may be more appeasing to the subjects and also role of counsellors, who can help the patient adjust well to his role limitations due to the disease. [Table 1]

Factors associated and influencing diabetic care scales, which after application of 2 step logistic regression are Education (UOR 0.76; SD 0.64 - 0.90, p=0.002), treatment, medical adherence type 2 about being careless with medications (AOR=2.38 SD 1.50 - 3.77, <0.001), morbidity, recovery and complications of eye, kidney and depression. The individual need high diabetic care (DCS more than median) 1.57 (1.11 – 2.22) times more likely they had insulin in comparison to those who had low DCS score, though it did not come significant in the adjusted ratios. [Table 2]

The study period offered us an opportunity to assess for subjects evaluated from December 2019 to March 21st 2020(until the first state wise lockdown started for Odisha) as pre COVID period and the data collated latter than this date as post COVID period and the pandemic is seen to affect DCS significantly (AOR=1.70 SD1.20 - 2.43; p=0.003). However, there is no major difference in the Mean±SD in the pre COVID and post COVID period of the sample as a whole (36.03±8.99 vs 38.08±9.26). Overall, the scale

is above 35 for both groups suggesting dissatisfaction in diabetic care, which has increased by 2 points in the average sample in the post COVID period.

Discussion

Adept extensive research has named diabetes as almost a preventable disease. Though the disease is multi etiological, what is preventable are the complications and deferring them with qualitative management of the disease. The key driver of this epidemic in India is mostly attributed to lifestyle transitions resulting in obesity and physical inactivity, increasing life expectancy and urbanization. (12,13) In India widows/widowers, older, wealthier, obese, and individuals with high BP have very high risk of both diagnosed and self-reported. Comparing to general, people from backward castes have less risk of self-reported but more risk of newly diagnosed with diabetes (14). This group might seemingly be presumed to have good compliance to the advices and other counseling offered but in reality, the chronicity of the disease demands a good amount of continuum of care and a good support system of the subject to protect against the long-term complications. Hence, the DCS as described in the methods is an abridged and close to real measure of patient behaviours immediately after diagnosis (12). It has only 15 questions which indicates the strengths and weaknesses of the management to the health provider, thus giving an early chance for rectification and caution.

In this study; results reiterate that self-care activities with respect to diet, exercise, medications are poor in this sample of eastern India and is also reported in a community-based survey in Urban Vellore and other studies in South India (15,16,17). Such studies are a necessity in the current context, so as to decrease the burden of complications, which has come out in our study that any form for complications, be it eye, kidney or depression affects the DCS scores significantly, supported by previously published literature, wherein though scores were not used. (18, 19) If these are the result from a tertiary care facility in an urban population, it can be well anticipated, the effect of the management course in rural areas.

This study has its limitations in terms of generalizability to whole of Odisha or eastern region as only one tertiary care facility outpatient was considered. However, it does strongly validate the use of DCS and QOLID scores in early diabetics to plan a better counselling for the subjects. It should be also replicated in rural settings as the early course is the most important period for strong and judicious interventions to influence a controllable course of the disease.

The study also had the rare opportunity to see the effect of the DCS scores in the pre covid and covid period diabetics (as it spanned across both the periods) and a deterioration of average scores was seen (36.03±8.99 vs 38.08±9.26). This could be attributed to the main focus of health care facilities on the pandemic situation and also the inaccessibility to diabetic or even other chronic diseases consultation. Thus, it also suggests that government should plan and prepare itself for such unprecedented situations and have provisions of telemedicine and essential health services ready for diabetes, such that those with the disease are not pushed into complications during any unexpected health events. In actuality also most deaths in the pandemic was reported among diabetics in state of Odisha (20).

Conclusion

Wide use of these tools is recommended, both in rural and urban scenario to improve and control the diabetic epidemic in India

Recommendation

The usage of these tools would refine the management of diabetics in India and offer qualitative tips to improve patient compliance to medications, follow up and prompt addressal of complications.

Limitation of the study

This study has its limitations in terms of generalizability to whole of Odisha or eastern Indian region, as only one tertiary care facility outpatients were considered. However, it does strongly validate the use of DCS and QOLID scores in early diabetics to plan a better counselling for the subjects. It should be also replicated in rural settings as the early course is the most important period for strong and judicious interventions to influence a controllable course of the disease. The study also had the rare opportunity to see the effect of the DCS scores in the pre covid and ongoing covid period (as it spanned across both the periods)

Relevance of the study

Wide use of these tools is recommended, both in rural and urban scenario to improve and control the diabetic epidemic in India

Authors Contribution

DM: Clinical manager and supervisor of Outpatient clinics, article writing'; SK: overall study supervision, tools development, data collection and article writing; MP: Statistical validation; SS: data collection and accessory cleaning data.

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Tables

TABLE 1 CORRELATION AND P VALUE FOR DOMAINS OF QOLID AND DIABETIC CARE

Domains of QOLID	Co-relation Coff.	p-Value
Treatment Satisfaction	-0.583	<0.001
General Health	-0.538	<0.001
Symptom Botherness	-0.315	<0.001

Financial Worries	-0.342	<0.001
Emotional and Mental health	-0.407	<0.001
Diet Satisfaction	0.070	0.083
Physical Endurance	-0.434	<0.001
Role Limitation due to Physical Health	0.422	<0.001
Overall QOL	-0.650	<0.001

TABLE 2 FACTORS AFFECTING DIABETIC CARE SCALE

Factors		Unadjusted		Adjusted	
	Number (%)	Odds Ratio (95% CI)	p-value	Odds Ratio (95% CI)	p-value
Residence					
Rural	245	1		-	-
Urban	354	1.05(0.76 - 1.46)	0.737	-	-
Education					
Illiterate	25	1		-	-
Primary and Above	574	0.76(0.64 - 0.90)	0.002	-	-
Tobaccco Chewing					
Yes	177	1		-	-
No	385	0.80 (0.60 − 1.06)	0.132	-	-
Tobacco smoke					
Yes	48	1		-	-
No	527	0.73 (0.45 − 1.16)	0.19	-	-
Alcohol Intake					
Yes	31	1		-	-
No	518	0.78 (0.50 − 1.20)	0.259	-	-
Treatment type					
Treatment type - Diet	451	1.09 (0.79 − 1.53)	0.588	-	-
Treatment type- Medicine	518	0.78 (0.48 − 1.25)	0.301	-	-
Treatment type- Insulin	197	1.57 (1.11 − 2.22)	**0.009**	-	-
Treatment type- ALL	102	1.22 (0.80 − 1.87)	0.349	-	-
Medicine Adherence					
Medicine Adherence 1 (Forget to take medication)	166	1.64 (1.14 − 2.35)	**0.007**	-	-
Medicine Adherence 2 (Careless about medication)	109	2.27 (1.48 - 3.50)	**<0.001**	**2.38(1.50 - 3.77)**	**<0.001**
Medicine Adherence 3 (Stopped after feeling better)	51	0.68 (0.38 − 1.23)	0.205	-	-
Medicine Adherence 4 (Stopped after feeling worse)	28	1.10 (0.51 − 2.34)	0.806	-	-
Co-morbidity					
Morbidity HTN	324	1.15 (0.83 − 1.59)	0.381	-	-
Morbidity Cancer	5	4.42 (0.50 - 39.84)	0.184	-	-
Recovery					
DCS		1.39 (1.12 - 1.71)	0.002	-	-
Complications Eye	350	2.16 (1.54 - 3.02)	<0.001	1.86(1.30 - 2.67)	0.001
Complications Foot	199	1.47 (1.04 - 2.07)	0.026	-	-
Complications Kidney	50	2.50 (1.34 - 4.62)	0.004	2.45(1.27 - 4.72)	0.007
Complications Ear	102	1.79 (1.16 - 2.76)	0.008	-	-
Complications Neuro	443	1.77 (1.22 - 2.58)	0.003	-	-
Complications Depression	357	2.17 (1.55 - 3.04)	<0.001	1.75(1.22 - 2.52)	0.002
Covid period after March 21, 2020					
DCS		1.50 (1.08 - 2.07)	**0.015**	1.70(1.20 - 2.43)	0.003
Age (in years)					
DCS		1.10 (0.80 - 1.51)	0.559	-	-
BMI(weight in kg/m²)					
DCS		0.84 (0.67 - 1.04)	0.112	-	-
Waist circumference					
DCS		0.72 (0.45 − 1.12)	0.148	-	-