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EFFECT OF COMPREHENSIVE CARE ON DIABETIC PATIENTS IN UHTC OF A TERTIARY CARE HOSPITAL IN TIRUVALLUR- AN OBSERVATORY-COMPARISON STUDY

DR. GOKUL D [1], DR. KOUSHIK M [2], DR KARTHIK K.R [3], DIVYA V [4], DR. NISHA B [5], DR. GANESH RAMESH[6],

[1] SENIOR RESIDENT, DEPARTMENT OF COMMUNITY MEDICINE, SAVEETHA MEDICAL COLLEGE & HOSPITAL, SAVEETHA INSTITUTE OF MEDICAL AND TECHNICAL SCIENCES (SIMATS), SAVEETHA UNIVERSITY, CHENNAI, TAMIL NADU, INDIA.

[2] ASSISTANT PROFESSOR, DEPARTMENT OF COMMUNITY MEDICINE, ACS MEDICAL COLLEGE & HOSPITAL, CHENNAI, TAMIL NADU. DR M.G.R. EDUCATIONAL AND RESEARCH INSTITUTE.

[3] DEPARTMENT OF COMMUNITY MEDICINE, SAVEETHA MEDICAL COLLEGE & HOSPITAL, SAVEETHA INSTITUTE OF MEDICAL AND TECHNICAL SCIENCES (SIMATS), SAVEETHA UNIVERSITY, CHENNAI, TAMIL NADU, INDIA.

[4] SAVEETHA MEDICAL COLLEGE & HOSPITAL, SAVEETHA INSTITUTE OF MEDICAL AND TECHNICAL SCIENCES (SIMATS), SAVEETHA UNIVERSITY, CHENNAI, TAMIL NADU, INDIA.

[5] ASSOCIATE PROFESSOR, DEPARTMENT OF COMMUNITY MEDICINE, SAVEETHA MEDICAL COLLEGE & HOSPITAL, SAVEETHA INSTITUTE OF MEDICAL AND TECHNICAL SCIENCES (SIMATS), SAVEETHA UNIVERSITY, CHENNAI, INDIA.

[6]PROFESSOR, DEPARTMENT OF PROSTHODONTICS AND CROWN & BRIDGE, SREE BALAJI DENTAL COLLEGE & HOSPITAL, CHENNAI, INDIA

*CORRESPONDING AUTHOR:
DR. NISHA B.
ASSOCIATE PROFESSOR, DEPARTMENT OF COMMUNITY MEDICINE, SAVEETHA MEDICAL COLLEGE & HOSPITAL, SAVEETHA INSTITUTE OF MEDICAL AND TECHNICAL SCIENCES (SIMATS), SAVEETHA UNIVERSITY, CHENNAI, INDIA.
email: nishachandru21@gmail.com

Abstract:

Background: Diabetes is a chronic**,** metabolic disease that over time causes serious damage to vital organs of the body which requires comprehensive care to manage. Thus, the study assessed the effect of Comprehensive care on diabetic patients with respect to their quality of life.

Methodology: An Observatory study was conducted for 396 Diabetic Patients, who registered in the Urban health training centre of a tertiary care hospital in Thiruvallur from April 2022- April 2023. Among those who were registered, those who consented to get comprehensive care for diabetes was 200. Comprehensive care for these patients included components such as Yoga, Diet Counselling, Physical exercise, Smoking and Tobacco Cessation, and Regular follow-up with adherence to medications. The quality of life of these patients following comprehensive care was assessed by using QOLID (quality of life in diabetes patients) and compared with the non-beneficiaries of comprehensive care. Independent sample t-tests were used to express the difference in QOLID scores among the participants, and multivariate logistic regression was performed.

Results: In our study, 396 patients enrolled for the NCD clinic, out of which 200 were beneficiaries of the comprehensive care and 196 were non-beneficiaries. The mean ± SD age of the study participants was 47 ± 4 (Range: 43 – 51 years) and 204 (52%) were females. The Mean QOLID scores for the beneficiaries after the period of comprehensive care were found to be **68.33 ± 10.16** for the non-beneficiaries it was **60.81 ± 6.28.** The difference in mean scores was found to be statistically significant with p value of < 0.01.

Conclusion: Comprehensive care for diabetic patients has a positive impact on their quality of life. It should be up-scaled and provided for the masses across the globe.

Keywords: *Diabetes, Yoga, Dieting, Comprehensive-care, NCD, Exercise*

INTRODUCTION:

Diabetes mellitus (DM) is a chronic metabolic condition characterized by elevated blood glucose levels due to insulin deficiencies. It can be divided into two main types: Type 1 Diabetes Mellitus (T1DM), caused by the autoimmune destruction of pancreatic beta cells leading to a complete lack of insulin, and Type 2 Diabetes Mellitus (T2DM), which is the most prevalent form, characterized by insulin resistance and partial insulin deficiency. [1]

T2DM is becoming increasingly recognized as a significant global health issue. India ranks second in the world in terms of prevalence rates, with 10% of the world's total diabetic patients. The estimated prevalence of T2DM is expected to reach 200 million by 2030, and by 2025, India is projected to become the global leader in diabetes cases, with 70 million individuals diagnosed. [2] In 2017, Tamil Nadu had a diabetes prevalence of 10.4%, with urban areas experiencing 10-12% and rural areas 7.8%. [3]

Chronic T2DM leads to various microvascular and macrovascular complications, affecting the quality of life of diabetic patients. Nephropathy and cardiovascular complications are the most common causes of morbidity and mortality. [4] The management of T2DM involves a combination of non-pharmacological and pharmacological methods. the pharmacological approach involves regular monitoring and proper adherence to medication.[5] The non-pharmacological approach involves lifestyle modifications. The condition can be effectively managed through a combination of lifestyle modifications, pharmacological management, patient education, and regular monitoring. This type of care is referred to as comprehensive care. The approach focuses on promoting a balanced diet, regular exercise, and consistent use of medication, while also offering psychological support and preventive measures to address potential complications.[6] The approach seeks to enhance the overall well-being of patients by addressing their physical, emotional, and social requirements. In 2008, the Indian Ministry of Health launched the National Programme to prevent and control common chronic diseases (NCDs) through behavior and lifestyle modifications, early diagnosis, and capacity building at various healthcare levels. The National Health Mission (NHM) also encompasses existing NCD control programs in urban and rural areas.[7]

“The World Health Organization defines the quality of life as an individual's perception of their position in life based on their goals, expectations, standards, and concerns”. [8] A study done on Quality of Life (QoL) in the Tiruvallur district shows that only half of the T2DM patients have good QoL [9] Patients with diabetes experience a further decline in QoL, particularly when complications arise or additional health conditions are present. Diabetes can negatively affect physical well-being in four major ways: a) by leading to the development of long-term complications, b) by being associated with short-term complications, c) through the demands imposed by various treatment regimens and d) by affecting psychological functioning via its impact on mood. [10]

Despite these strategies, there remains a need to observe the impact of comprehensive care on the quality of life of diabetic patients, particularly in different socio-economic and cultural contexts. Thus, the current study aims to observe the effect of comprehensive care on diabetic patients concerning their quality of life.

MATERIALS AND METHODS

Study Design

This Observatory-Comparison Study was conducted for a period of 1 year between April 2022 to April 2023 in the Urban Health Training Centre of a tertiary care hospital in Thiruvallur after obtaining clearance from the Scientific Research and Institutional Ethics Committee (SMC/IEC/04/025).

Study Population

All patients diagnosed with Type 2 Diabetes Mellitus (T2DM) with a duration of illness of a minimum of 1 year were included in this study. Patients who were not willing to participate, or who had other comorbidities or severe illnesses, were excluded. A total of 396 patients met the inclusion criteria, of which 200 were beneficiaries of comprehensive care, and 196 were non-beneficiaries.

Intervention

Comprehensive care for the beneficiaries included components such as Yoga, Diet Counseling, Physical Exercise, Smoking and Tobacco Cessation, and Regular follow-up with adherence to medications. [11,12]

Sampling Technique

A convenience sampling technique was used in this study to choose the participants.

Data Collection

Data were collected using a validated, pre-tested semi-structured questionnaire, which consists of two parts:

1. **Part 1:** Collected socio-demographic data (age, sex, socioeconomic status, occupation, marital status, alcohol, and smoking habits), duration of the disease, the presence of any comorbidity, and medication details.
2. **Part 2:** Assessed the Quality of Life using the Quality of Life in Diabetic Patient questionnaire (QOLID). The questionnaire consists of 34 items covering eight domains which comprehensively cover aspects of quality of life, namely role limitations due to physical health, physical endurance, general health, treatment satisfaction, symptom frequency, financial worries, mental health, and diet advice satisfaction, arranged on a Likert scale. [13,14,15]

Statistical Analysis

Data collected were entered into a Microsoft Excel sheet and analyzed using SPSS version 25. Quantitative variables were expressed as Mean and Standard Deviation. Independent sample t-tests were used to express the difference in QOLID scores among the participants, and multivariate logistic regression was performed.

RESULTS

Table 1: Socio-demographic details of study participants (n=396)

Variable	Frequency (%)
Age	
31-40	135 (34)
41-50	156 (39)
51-60	26 (07)
61-70	27 (07)
>70	52 (13)
Sex	
Male	192 (48)
Female	204 (52)
Socioeconomic status	
Class I	81 (20)
Class II	137 (35)
Class III	122 (31)
Class IV	56 (14)
Marital status	
Unmarried	49 (12)
Married	328 (83)
Divorced	11 (03)
Widow	08 (02)
Education	
Primary and secondary	145 (37)
Higher Secondary	91 (23)
UG degree	93 (23)

PG degree	42 (11)
Illiterate	25 (06)
H/o Alcoholic	
No	331 (84)
Yes	65 (16)
H/o Smoking	
No	344 (87)
Yes	52 (13)

Table 1 shows the baseline characteristics of the 396 participants. The majority of participants were between 41-50 years of age (39%), followed by 31-40 years (34%). Females slightly outnumbered males (52% vs 48%). In terms of socioeconomic status, most participants were in Class II (35%) and Class III (31%). Most were married (83%), with only a small percentage being unmarried, divorced, or widowed. Education levels varied, with a large number educated up to primary/secondary level (37%), and a smaller proportion holding a postgraduate degree (11%). Regarding substance use history, 16% reported alcohol use and 13% reported smoking.

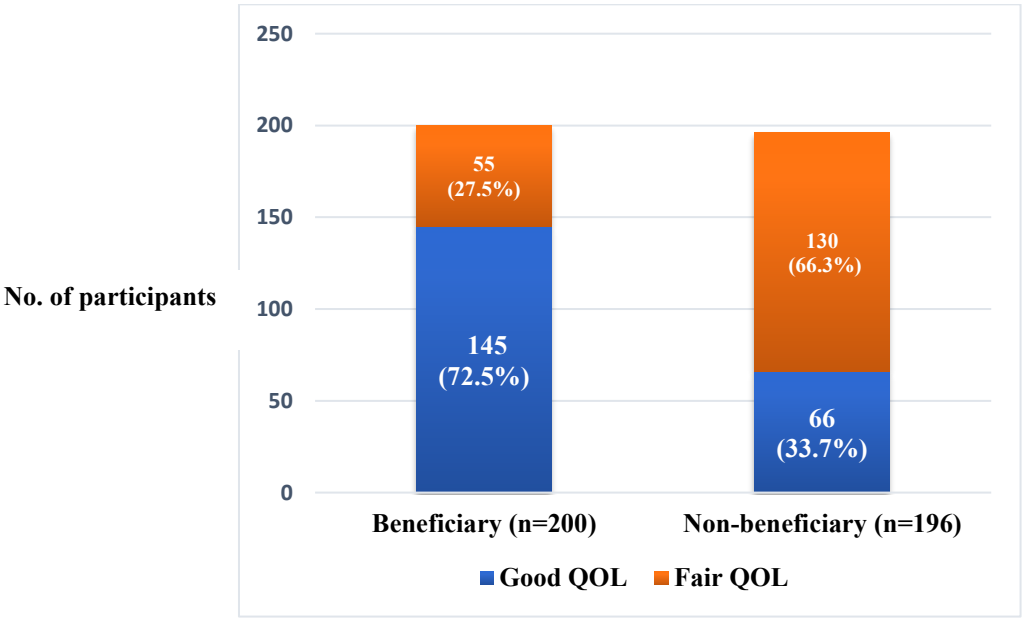

Fig. 1: Distribution of participants based on good and fair QOL among beneficiaries and non-beneficiaries (n=396)

Figure 1 illustrates the proportion of participants with good vs. fair quality of life, comparing those who received comprehensive diabetic care (beneficiaries) to those who did not (non-beneficiaries). Among the beneficiaries, 72.5% were found to have a good QOL, while 27.5% had a fair QOL. In contrast, among the non-beneficiaries, only 33.7% had a good QOL, whereas a larger proportion 66.3% had a fair QOL.

Table 2: Comparison of Comprehensive care among beneficiaries and non-beneficiaries using QOLIID scores (n = 396)

Domains of QOLID Score	Beneficiaries (n = 200) (Mean ± SD)	Non - Beneficiaries (n = 196) (Mean ± SD)	Mean difference	p value*
Role Limitation	75.35 ± 15.87	71.46 ± 14.25	3.89	**0.018***

Physical Endurance	77.18 ± 12.66	71.30 ± 11.98	5.88	**0.001***
General Health	68.20 ± 12.60	58.40 ± 9.00	9.8	**0.001***
Treatment sensitisation	69.82 ± 12.22	53.41 ± 9.80	16.41	**0.001***
Symptom botherness	68.13 ± 14.11	61.49 ± 11.79	6.64	**0.001***
Financial Worries	50.75 ± 7.80	49.56 ± 8.98	1.19	0.09
Mental Health	65.32 ± 12.19	60.26 ± 9.11	5.06	**0.001***
Diet satisfaction	66.59 ± 12.83	67.93 ± 13.0	1.34	0.08
Total score	68.33 ± 10.16	60.81 ± 6.28	7.52	**0.001***

*** p Value <0.05 is considered as statistically significant**

Table 2 shows the comparison of mean QOLID scores across various domains between beneficiaries and non-beneficiaries of comprehensive diabetic care. The scores were consistently higher among beneficiaries across most domains. Notably, the domains of general health, treatment sensitisation, and physical endurance exhibited the largest differences in mean scores between the two groups. While the domains of financial worries and diet satisfaction did not show statistically significant differences, other domains such as role limitation, symptom botherness, and mental health were significantly better among beneficiaries. The overall QOLID score was also higher in the beneficiary group (68.33 ± 10.16) compared to the non-beneficiary group (60.81 ± 6.28), indicating differences in perceived quality of life between the two groups.

Table 3: Association between sociodemographic variables and QOLID scores among beneficiaries of Diabetic comprehensive care (N=200)

Sociodemographic variables	Good QOLID score (n=145) n (%)	Fair QOLID score (n=55) n (%)	Chi-square value χ^2	p-value*
Age (years)				
≤50	105 (73.4)	38 (26.6)	0.21	0.64
>51	40 (70.2)	17 (29.8)		
Sex				
Male	61 (69.3)	27 (30.7)	0.79	0.372
Female	84 (75)	28 (25)		
Socioeconomic status				
Class I, II	102 (88.7)	13 (11.3)	35.59	**<0.001***
Class III, IV, V	43 (50.6)	42 (49.4)		
Marital status				
Living with partner	135 (73)	50 (27)	0.27	0.598
Living without Partner	10 (66.7)	05 (33.3)		

Education				
Literate	144 (73.5)	52 (26.5)	4.62	**0.03****
Illiterate	01 (25)	03 (75)		
H/o Alcoholic				
No	23 (46)	27 (54)	23.5	**<0.001***
Yes	122 (81.3)	28 (18.7)		
H/o Smoking				
No	13 (32.5)	27 (67.5)	40.1	**<0.001***
Yes	132 (82.5)	28 (17.5)		

*** p Value <0.05 is considered as statistically significant (Chi-square test)**
**** Fisher's exact test**

Table 3 highlights the association between sociodemographic variables and QOLID scores among beneficiaries of comprehensive diabetic care. Statistically significant associations were observed with several factors. Participants from higher socioeconomic classes (Class I and II) had better QOLID scores (88.7%) compared to those from lower classes (50.6%), with a p-value of <0.001. Literacy was also significantly associated, with 73.5% of literates reporting good QOL compared to 25% of illiterates ($p = 0.03$). Alcohol use showed a significant association, with 81.3% of non-users having good QOL versus 46% of users ($p < 0.001$). Similarly, smoking status was significantly associated with QOL, where 82.5% of non-smokers had good QOL compared to 32.5% of smokers ($p < 0.001$). On the other hand, no significant associations were found with age ($p = 0.64$), sex ($p = 0.372$), and marital status ($p = 0.598$).

Table 4: Association between sociodemographic variables and QOLID scores among non-beneficiaries of Diabetic comprehensive care (N=196)

Sociodemographic Variables	Good QOLID score (n=66) n (%)	Fair QOLID score (n=130) n (%)	Chi-square value χ^2	p-value*
Age				
≤50	49 (33.1)	99 (66.9)	0.08	0.76
>51	17 (35.4)	31 (64.6)		
Sex				
Male	35 (33.7)	69 (66.3)	3.82	0.995
Female	31 (33.7)	61 (66.3)		
Socioeconomic status				
Class I, II	55 (53.4)	48 (46.6)	37.81	**<0.001***
Class III, IV, V	11 (11.8)	82 (88.2)		
Marital status				
Living with partner	57 (35.2)	105 (64.8)	0.95	0.328
Living without Partner	09 (26.5)	25 (73.5)		
Education				
Literate	65 (37.1)	110 (62.9)	8.80	**0.003****
Illiterate	01 (4.8)	20 (95.2)		
H/o Alcoholic				
No	02 (13.3)	13 (86.7)	3.01	0.083
Yes	64 (35.4)	117 (64.6)		
H/o Smoking				
No	12 (54.5)	10 (45.5)	1.88	0.198
Yes	64 (34.8)	120 (65.2)		

*** p Value <0.05 is considered as statistically significant (Chi-square test)**
**** Fisher's exact test**

Table 4 shows the association between sociodemographic variables and QOLID scores among non-beneficiaries of diabetic comprehensive care. Significant associations were found for socioeconomic status and literacy, where 53.4% of participants from higher socioeconomic classes (Class I and II) had good QOLID scores compared to only 11.8% from lower classes ($p < 0.001$), and 37.1% of literate individuals reported good QOL compared to just 4.8% among illiterates ($p = 0.003$). In contrast, variables such as age ($p = 0.76$), sex ($p = 0.995$), marital status ($p = 0.328$), alcohol use ($p = 0.083$), and smoking ($p = 0.198$) did not show statistically significant associations with QOLID scores in this group.

Table 5: Binary Logistic regression of factors affecting QOLID among beneficiaries of Diabetic Comprehensive care (n=200)

Sociodemographic Variables	Good QOLID score (n=145) n (%)	Fair QOLID score (n=55) n (%)	Adjusted OR (95% CI)	p-value
Age				
≤50	105 (72.4)	38 (69.1)	1	
>51	40 (27.6)	17 (30.9)	0.56 (0.26-1.22)	0.147
Sex				
Male	61 (42.1)	27 (49.1)	1	
Female	84 (57.9)	28 (50.9)	0.753 (0.404-1.404)	0.372
Socioeconomic status				
Class I, II	102 (70.3)	13 (23.6)	1	
Class III, IV, V	43 (29.7)	42 (76.4)	7.66 (3.74-15.70)	**<0.001***
Marital status				
Living with partner	135 (93.1)	50 (90.9)	1	
Living without Partner	10 (6.9)	05 (9.1)	1.26 (0.49-3.29)	0.631
Education				
Literate	144 (99.3)	52 (94.5)	1	
Illiterate	01 (0.7)	03 (5.5)	8.31 (0.85-81.66)	0.07
H/o Alcoholic				
No	23 (15.9)	27 (49.1)	1	
Yes	122 (84.1)	28 (50.9)	5.12 (2.56-10.21)	**0.001***
H/o Smoking				
No	13 (9)	27 (49.1)	1	
Yes	132 (91)	28 (50.9)	9.79 (4.50-21.30)	**0.001***

*** p Value <0.05 is considered as statistically significant, binary logistic regression**

1- Reference category

Table 5 shows the binary logistic regression analysis of factors affecting QOLID scores among beneficiaries of diabetic comprehensive care. The analysis identified socioeconomic status, alcohol use, and smoking as significant predictors of quality of life. Participants from lower socioeconomic classes (Class III, IV, V) were more likely to have a fair QOL compared to those from higher classes (Class I, II), with an adjusted odds ratio (AOR) of 7.66 (95% CI: 3.74–15.70; $p < 0.001$). Similarly, individuals with a history of alcohol use had higher odds of reporting fair QOL (AOR: 5.12; 95% CI: 2.56–10.21; $p = 0.001$), and those with a history of smoking had even higher odds (AOR: 9.79; 95% CI: 4.50–21.30; $p = 0.001$). On the other hand, factors such as age ($p = 0.147$), sex ($p = 0.372$), marital status ($p = 0.631$), and education ($p = 0.07$) were not significantly associated with QOLID scores in this model.

DISCUSSION:

This study investigated the quality of life (QOL) among individuals diagnosed with diabetes mellitus, comparing outcomes between those enrolled in a comprehensive diabetic care program and those who were not. Furthermore, the study explored the role of sociodemographic and behavioral variables on patient-reported outcomes.

The demographic profile of the participants revealed that the majority were middle-aged, with a nearly equal distribution of male and female participants and a predominance of married individuals. A significant portion belonged to socioeconomic Class II and III, and education levels varied, reflecting the diversity of outpatient diabetic populations in the Indian setting. [16]
Patients who received comprehensive diabetic care demonstrated notably better QOL scores, with 72.5% reporting good QOL compared to 33.7% among non-beneficiaries. These results align with earlier findings that emphasize the benefits of integrated care approaches—such as regular follow-up, health education, and multidisciplinary involvement—in improving the health outcomes and perceived wellbeing of diabetic patients.[17,18,19] Notable improvements were observed among beneficiaries in domains including general health, physical endurance, treatment awareness, and mental health. These observations are consistent with previous studies by Goli et al. and Arora et al., where similar interventions led to enhanced quality of life.[20,21]
Socioeconomic status and literacy emerged as significant predictors of better QOL across both groups. Individuals from higher income brackets and those with reading and writing skills had greater odds of maintaining a satisfactory QOL, likely due to better healthcare access and self-management capability. These findings corroborate the association between higher socioeconomic position and favorable diabetes outcomes reported in existing literature. [22,23]
Among beneficiaries, behavioral factors such as abstinence from alcohol and smoking were also associated with better QOL. These patterns were supported by multivariate logistic regression, which identified lower socioeconomic status (AOR = 7.66), alcohol use (AOR = 5.12), and smoking (AOR = 9.79) as independent predictors of lower QOL. The association of substance use with poor health outcomes in diabetes is well established. [24,25,26]
Demographic variables such as age, sex, marital status, and education did not show statistically significant associations in the multivariate analysis. This suggests that modifiable behavioral and social factors may play a more decisive role in influencing patient-reported quality of life. This trend is supported by previous findings from Wändell et al. and Chaturvedi et al., who also reported stronger links between behavioral and social determinants and QOL than demographic characteristics [27,28].
Overall, this study underscores the importance of comprehensive care and targeted behavioral interventions to improve the quality of life in diabetic patients.

CONCLUSION:

The findings of this study indicate that individuals with diabetes mellitus who receive comprehensive diabetic care experience significantly better quality of life compared to those who do not. The structured approach to care, involving regular monitoring, education, and support, led to notable improvements in key domains such as general health, physical endurance, treatment awareness, and mental health. Factors such as higher socioeconomic status, literacy, and the absence of smoking or alcohol use were strongly associated with better outcomes. Multivariate analysis confirmed that these behavioral and socioeconomic variables play a crucial role in shaping the quality of life among diabetic patients. These results emphasize the value of integrating social and behavioral support into routine diabetes management to achieve better patient-centered outcomes.

LIMITATION:

Despite its valuable insights, the study has certain limitations. Data collection relied on self-reported responses, which may be influenced by recall or social desirability bias. Additionally, clinical variables such as glycemic control, disease duration, presence of complications, and adherence to treatment regimens were not assessed. These unmeasured confounders could potentially affect the quality-of-life outcomes. Lastly, as the study was conducted in a single urban setting, the findings may not be generalizable to broader or rural diabetic populations.

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