ORIGINAL RESEARCH ARTICLE

Social Support and Medication Adherence Among People with Type 2 Diabetes Mellitus in Central Karnataka, India

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ABSTRACT

Background: Social support is crucial to improving the health of people with type 2 diabetes mellitus through medication adherence.

Objectives: 1. To assess the social support and medication adherence among people with Type 2 diabetes mellitus. 2. To study the factors associated with social support and medication adherence among people with Type 2 diabetes mellitus.

Methodology: This community-based study was undertaken among 150 people with type 2 diabetes mellitus. Social support was assessed using standard, validated Multidimensional Scale of Perceived Social Support. Medication adherence was assessed using standard, validated 8-item Morisky adherence scale.

Results: Mean age of study participants was 57.42±11.07 years. In the present study 87 (58%) had high social support followed by moderate support 63 (42%). In the present study majority of study participants 83 (55%) had moderate medication adherence followed by low medication adherence 67 (45%).

Conclusions: Social support plays an important role in promoting medication adherence among diabetes patients.

Key words: Social support, Medication adherence, Type 2 diabetes mellitus

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INTRODUCTION

Diabetes mellitus, a chronic metabolic condition, is a major public health concern around the world. According to the International Diabetes Federation (IDF), there were approximately 463 million people with type 2 diabetes mellitus in 2019, with the number expected to rise to 700 million by 2045. As of 2019, it was estimated that around 77 million adults aged 20-79 years had diabetes in India, making it one of the countries with the highest number of people affected by diabetes.[1] This number is expected to rise in the coming years due to various factors such as urbanization, sedentary lifestyles, unhealthy diets, and genetic predisposition.[2] It is crucial to raise awareness, promote early detection, and encourage healthy lifestyle practices to effectively manage and prevent diabetes in India.[3]

Effective management including healthy lifestyle management, medication adherence, and regular follow-up is critical for avoiding complications such as cardiovascular disease, renal failure, retinopathy, and neuropathy.[4,5]

Social support refers to the assistance, encouragement, and understanding that individuals receive from their social networks, such as family, friends, or support groups.[6] Medication adherence is the extent to which people take their prescribed medications.[7] Many studies have found that people who receive social support through emotional, practical, informational, and accountability are more likely to stick to their diabetic prescriptions, which leads to better glycaemic control and general health.[8-10]

Considering the multifaceted nature of diabetes management, it is crucial for healthcare professionals to help people with diabetes mellitus develop and maintain a strong social support system. Engaging in support groups, seeking out online communities, involving family and friends in diabetes education, and connecting with healthcare professionals can all contribute to a holistic approach to diabetes care.[11]

Thus, through this study we aim to assess the social support and medication adherence among people with type 2 diabetes mellitus in central Karnataka, India.

The objectives of this study were to assess the social support and medication adherence among people with Type 2 diabetes mellitus and also to study the factors associated with social support and medication adherence among them.

METHODOLOGY

It was community based cross sectional study conducted for the duration of 6 months from 1st June to 30th November 2022. There is total 8 slums with of population of 16,599 with households of 3405 under urban field practice area of tertiary care teaching hospital, Central Karnataka. Among 8 slums, four slums were selected randomly. Total 1625 households were visited. Among the households visited, 183 known cases of type 2 diabetes were found. Permanent residents of selected urban slums who were living with type 2 diabetes mellitus and on treatment for at least one year were recruited for the study through the house-to-house visits. Those who were not able to contact even after 3 visits and refused to be the part of the study were excluded. Out 183 people with type 2 diabetes, 150 people with type 2 Diabetes mellitus satisfying inclusion and exclusion criteria were recruited for the study.

After getting clearance from institution's ethical review board (Reference no: JJMMC/IEC_16-2022 dated 20th May 2022) and informed written consent from study participants, data was collected using predesigned, pretested, semi-structured questionnaire consisting of information on socio-demographic characteristics, duration of diabetes, family history of diabetes, glycaemic status (Glycated Haemoglobin <6.5% is considered as normal and ≥ 6.5% as high[12]) and health insurance and also the participants were examined for body mass index. Body mass index (BMI) was calculated using formula: BMI = weight (kg)/height (mt)2 and it was categorized as per WHO criteria for Asia Pacific population[13]. BMI <18.5 was categorized as underweight, 18.5–22.9 as normal range, 23–24.9 as overweight, 25–29.9 as obese I and ≥30 as obese II. Using WHO proposed methods, weight was measured with an accuracy of 0.1 kg by using weighing machine and anthropometry rod was used for measuring height with an accuracy of 0.1 cm.

Social support was assessed using standard, validated Multidimensional Scale of Perceived Social Support (Zimet, Dahlem, Zimet & Farley, 1988)[14]. This is a brief tool that can be used to assess any individual' sense of support from three different sources: family, friend and a significant other. This instrument consists of 12 questions. The responses were categorised using a 5-point Likert scale (0 = strongly disagree, 5 = strongly agree). The scale was categorised into low support (score of 1 to 2.9), moderate support (score of 3-5) and high adherence (score of 5.1 to 7).

Medication adherence was assessed using standard, validated 8-item Morisky adherence scale.[15] This is a beneficial resource for addressing adherence issues among patients. The scale includes elements of forgetfulness, symptom severity, situational and emotional aspects of medication adherence. Patient is considered more adherent if the score is higher on the scale. Responses were categorised as yes/no for each item and a 5-point Likert response for the last item. The scale was categorised into low adherence (score of <6), medium adherence (score of 6-<8) and high adherence (score of 8).

Both the questionnaires were translated to local Kannada language and back translated. Content va-

lidity was done by subject and language experts. Internal consistency was calculated by Cronbach's alpha. It was found to be 0.78 for Multidimensional Scale of Perceived Social Support and 0.82 for 8-item Morisky adherence scale.

Data was entered in Microsoft excel 2019 and analysed using IBM SPSS v26.0 software. Data was presented in the form of descriptive statistics (means, proportions and percentage). Chi square test was applied to know association of factors with social support and medication adherence. P value less than 0.05 was considered statistically significant.

RESULTS

A total of 150 people living with type 2 diabetes mellitus on medication on at least one year were recruited for the study. Among them 46 % of the study participants were in the age group of 60 years and above followed by 45 to 59years (43%). Mean age of study participants was 57.42±11.07 years. In the present study 55% were females and 45% were males. In our study 55% were from urban areas, 43% were illiterate, and 47% were educated up to high school. In our study 71% were currently working and 11% were homemakers. Majority of participants were belonging to class IV and V according to modified B G Prasad socio-economic classification (59%) and 33% had health insurance. Majority of participants were having Diabetes mellitus since 1 to 4 years with mean duration of diabetes 11.07±4.90 years. . In present study 53% were obese, 13% were alcoholic and 27% participants had family history of Diabetes mellitus. In the present study 91% had achieved normal HBa1C level. (Table 1)

In the current study high adherence was not reported among any of the study participants. In the present study moderate adherence was observed in age group of 45 to 59 years 38 (46%), in males 37 (55%), among study participants from rural areas 44 (53%), studied up to high school 40 (48%) ,currently working 60 (72%) , belonging class IV socio economic status 29 (35%) , among married 66 (99%), who had diabetes of duration 1 to 4 years 42 (51%), obese 46 (55%), who didn't have any habits 63 (76%) ,who had family history of diabetes 64 (77%), who had normal HBA1C level 73 (88%). Who don't have health insurance 55 (66%). None of these factors were statistically associated with adherence to medication (Table 2)

In the present study low social support was not reported among any of the study participants In the present study high social support was seen in the age group 45 to 59years 40 (46%), in males 45 (52%) , among study participants from rural areas 44 (51%), study participants studied up to high school 42 (48%), currently working 65 (75%), belonging class IV socio economic status 30 (34%), married 85 (98%),who had diabetes of duration 1 to 4 years 47 (54%), obese 46 (53%) ,who didn't have any habits 62 (71%), who don't have family history of diabetes 65 (75%), who had normal HBA1C level 75 (86%),who don't have any health insurance 53 (61%). Out of all these factors sex, occupation, health insurance and glycaemic status were statistically associated social support (Table 3).

Table 1: Clinico-socio-demographic characteristics of study participants (n= 150)

Variable	Participants (%)
Age group (Years)	
30-44	16 (10.7)
45 -59	65 (43.3)
60 and above	69 (46)
Sex	
Male	67 (44.7)
Female	83 (55.3)
Residence	
Rural	67 (44.7)
Urban	83 (55.3)
Education	
Illiterate	64 (42.7)
Up to High school	71 (47.3)
PUC and above	15 (10)
Occupation	
Currently working	107 (71.3)
Homemaker	16 (10.7)
Currently not working	27 (18)
Socioeconomic status	
Class I	25 (16.7)
Class II	7 (4.7)
Class III	29 (19.3)
Class IV	54 (36)
Class V	35 (23.3)
Health insurance	
Yes	49 (32.7)
No	101 (67.3)
Marital status	
Married	148 (98.7)
Widow/widower	2 (1.3)
Duration of diabetes (years)	
4-Jan	83 (55.3)
9-May	44 (29.3)
14-Oct	16 (10.7)
15 and above	7 (4.7)
Body Mass Index (Kg/m^2)	
underweight (BMI <18.5)	5 (3.3)
Normal (BMI 18.5-22.9)	46 (30.7)
Overweight (BMI 23-24.9)	19 (12.7)
Obese (BMI >25)	80 (53.3)
Habits	
Smoking	26 (17.3)
Alcohol	19 (12.7)
None	105 (70)
Family History of Diabetes	
Yes	41 (27.3)
No	109 (72.7)
Glycaemic status (HbA1C)*	
Normal (<6.5%)	137 (91.3)
High (≥ 6.5%)	13 (8.7)

*Glycated Haemoglobin

Table 2: Factors associated with Adherence to medication

Variable	Low medication adherence	Moderate medication adherence	P value	Crude Odds ratio	95% CI
Age group (Years)					
30-44*	8 (11.9)	8 (9.6)	0.77	Ref	
45 -59	27 (40.3)	38 (45.8)		1.4	0.46-4.21
60 and above	32 (47.8)	37 (44.6)		1.15	0.38-3.43
Sex					
Male	37 (55.2)	46 (55.4)	0.981	0.99	0.51-1.89
Female	30 (44.8)	37 (44.6)		Ref	
Residence					
Rural	23 (34.3)	44 (53.0)	0.22	0.46	0.23-0.89
Urban	44 (65.7)	39 (47.0)		Ref	
Education					
Illiterate*	31 (46.3)	33 (49.8)	0.555	Ref	
Up to High school	31 (46.3)	40 (48.2)		1.21	0.61-2.38
PUC and above	5 (7.5)	10 (12.0)		1.87	0.57-6.11
Occupation					
Currently working	47 (70.1)	60 (72.3)	0.922	1.18	0.50-2.76
Homemaker	7 (10.4)	9 (10.8)		1.19	0.34-4.13
Currently not working*	13 (19.4)	14 (16.9)		Ref	
Socioeconomic status					
Class I	8 (11.9)	17 (20.5)	0.523	1.12	0.35-3.60
Class II	2 (3.0)	5 (6.0)		2.5	0.42-14.71
Class III	15 (22.4)	14 (16.9)		0.93	0.34-2.51
Class IV	25 (37.3)	29 (34.9)		1.16	0.49-2.73
Class V*	17 (25.4)	18 (21.7)		Ref	
Marital status					
Married	66 (98.5)	82 (98.8)	0.879	0.8	0.04-13.11
Widow/widower	1 (1.5)	1 (1.2)		Ref	
Duration of diabetes (years)					
1 -4*	41 (61.2)	42 (50.6)	0.628	1.55	0.73-3.26
9-May	17 (25.4)	27 (32.5)		1.62	0.54-4.88
14-Oct	6 (9.0)	10 (12.0)		1.3	0.27-6.17
15 and above	3 (4.5)	4 (4.8)		Ref	
Body Mass Index (Kg/m^2)					
underweight	02 (3.0)	3 (3.6)	0.667	1.15	0.17-7.57
Normal*	20 (29.9)	26 (31.3)		Ref	
Overweight	11 (16.4)	8 (9.6)		0.55	0.18-1.64
Obese	34 (50.7)	46 (55.4)		1.04	0.50-2.16
Habits					
Smoking	17 (25.4)	9 (10.8)	0.064	0.35	0.14-0.86
Alcohol	8 (11.9)	11 (13.3)		0.91	0.34-2.46
None*	42 (62.7)	63 (75.9)		Ref	
Family History of Diabetes					
Yes	22 (32.8)	64 (77.1)	0.174	0.14	0.07-0.29
No	45 (67.2)	19 (22.9)		Ref	
Glycaemic status (HBA1C)					
Normal	64 (95.5)	73 (88.0)	0.101	2.92,0.11	0.77-11.08
High	3 (4.5)	10 (12.0)		Ref	
Health insurance					
Yes	21 (31.3)	28 (33.7)	0.756	0.89	0.45-1.78
No	46 (68.7)	55 (66.3)		Ref	

*Reference, 95% Confidence Interval

In the present study majority of study participants 87 (58%) had high social support followed by moderate support 63 (42%). None of the study participants had low social support. In the present study majority of study participants 83 (55%) had moderate medication adherence followed by low medication adherence 67 (45%). None of the participants had high medication adherence.

Among study participants with high social support 55 (66%) of them had moderate medication adherence. Among study participants with low medication adherence 35 (52%) had moderate social support. The association between total perceived social support and medication adherence was found to be statistically significant (X^2 =5.21 P= 0.02) (Table 4)

Table 3: Factors associated with social support

Variable	High support	Moderate support	P value	Crude Odds Ratio	95%CI
Age group (Years)					
30-44*	9 (10.3)	7 (11.1)	0.742	Ref	
45 -59	40 (46.0)	25 (39.7)		0.8	0.26-2.43
60 and above	38 (43.7)	31 (49.2)		1.04	0.35-3.13
Sex					
Male	45 (51.7)	22 (34.9)	0.041	1.99	1.02-3.89
Female	42 (48.3)	41 (65.1)		Ref	
Residence					
Rural	44 (50.6)	23 (36.5)	0.087	1.77	0.91-3.45
Urban	43 (49.4)	40 (63.5)		Ref	
Education					
Illiterate*	34 (39.1)	30 (47.6)	0.348	Ref	
Up to High school	42 (48.3)	29 (46.0)		0.78	0.39-1.54
PUC and above	11 (12.6)	4 (6.3)		0.41	0.11-1.41
Occupation					
Currently working	65 (74.7)	42 (66.7)	0.028	0.38	0.15-0.90
Homemaker	12 (13.8)	4 (6.3)		0.19	0.04-0.77
Currently not working*	10 (11.5)	17 (27.0)		Ref	
Socioeconomic status					
Class I	20 (23.3)	5 (7.9)	0.127	0.33	0.10-1.09
Class II	4 (4.6)	3 (4.8)		Ref	0.19-5.15
Class III	13 (14.9)	16 (25.4)		1.64	0.60-4.42
Class IV	30 (34.5)	24 (38.1)		1.06	0.45-2.51
Class V*	20 (23.0)	15 (23.8)			
Marital status					
Married	85 (97.7)	63 (100)	0.226	0.26	0.01-5.70
Widow/widower	2 (2.3)	0		Ref	
Duration of diabetes (years)					
1 -4*	47 (54.0)	36 (57.1)	0.195	Ref	
9-May	30 (34.5)	14 (22.2)		0.6	0.28-1.31
14-Oct	6 (6.9)	10 (15.9)		2.17	0.72-6.54
15 and above	4 (4.6)	3 (4.8)		0.97	0.20-4.65
Body Mass Index (Kg/m^2)					
underweight	02 (2.3)	3 (4.8)	0.843	2.33	0.35-15.36
Normal*	28 (32.2)	18 (28.6)		Ref	
Overweight	11 (12.6)	8 (12.7)		1.13	0.38-3.35
Obese	46 (52.9)	34 (54.0)		1.14	0.54-2.40
Habits					
Smoking	13 (14.9)	13 (20.6)	0.626	1.44	0.60-3.41
Alcohol	12 (13.8)	7 (11.1)		0.84	0.30-2.30
None*	62 (71.3)	43 (68.3)		Ref	
Family History of Diabetes					
Yes	22 (25.3)	19 (30.2)	0.509	0.78	0.38-1.61
No	65 (74.7)	44 (69.8)		Ref	
Glycaemic status (HBA1C)					
Normal	75 (86.2)	62 (98.4)	0.009	0.1	0.01-0.79
High	12 (13.8)	1 (1.6)		Ref	
Health insurance					
Yes	34 (39.1)	15 (23.8)	0.049	2.05	0.99-4.22
No	53 (60.9)	48 (76.2)		Ref	

*Reference, 95% Confidence Interval

Table 4: Association of social support with medication adherence

Variable	Moderate medication adherence	Low medication adherence
High social support	55 (66.0%)	32 (48.0%)
Moderate social support	28 (34.0 %)	35 (52.0%)

Chi square value 5.21, P value 0.02

In the present study majority of study participants 87 (58%) had high social support followed by moderate support 63 (42%). None of the study participants had low social support. In the present study majority of study participants 83 (55%) had moderate medication adherence followed by low medication adherence 67 (45%). None of the participants had high medication adherence.

Among study participants with high social support 55 (66%) of them had moderate medication adher-

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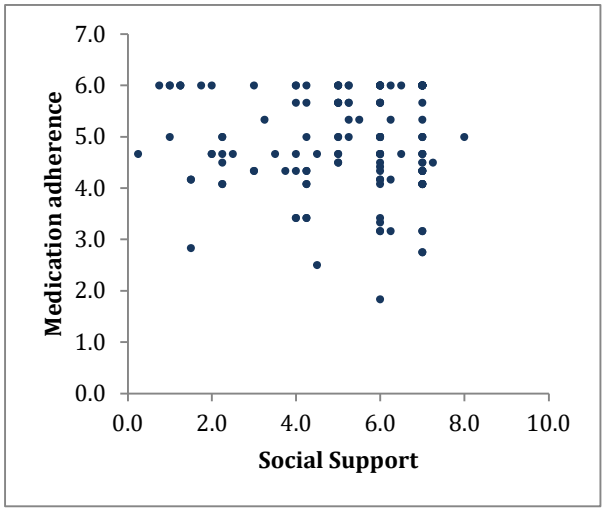

Figure:1 Association of social support with medication adherence

The scatter diagram shows how the individual's social support can change medication adherence. There is clear increase in mediation adherence following higher social support.

Discussion

The mean age of the study participants in this study was 57.42±11.07 years and similar finding was observed in the study conducted by Linni Gu et al[16](57.23±11.43). This finding is higher than studies conducted by Okwuosa JC et al[17] in the diabetic clinic of the Federal Medical Centre, Asaba was 51.9 ± 6.1 years, the study conducted by Ufuoma et al[18] among people living with type 2 diabetics mellitus in Warri metropolis, Delta State was 54.8 ± 11. 9 years, the study conducted by Biru TT[19] at Mizan Tepi University, Ethiopia was 52.68 ± 11.17.14 and study conducted by Iloh et al[20] was 36.8 ± 5.4 years.

In the present study 46% of study participants were in the age group of ≥60 years compare to similar study conducted by Okwuosa JC et al[17] where majority of study population (45.5%) were in the age of 54 years and above. In the study conducted by N duati et al[21] majority of study participants (45.6%) were in the younger age group of 41 to 55 years[19]. This discrepancy in observation may be due to difference in the age group of the population in these studies as majority of study participants in the present were middle aged and elderly.

In the current study majority of study participants were females (55%). Almost Similar findings were observed. In the study conducted by Okwuosa JC et al[17] (60%), Onodugo et al[22] (62.2%) and Anthony et al[23](66.9%) in rural communities of Abuja. This finding may be because of more availability of elderly females at the time of data collection as it was a community-based study.

In the present study most of study participants (99%) were married and it is higher than study conducted by Okwuosa JC et al[17] (62.7 %). In the current study Majority of study participants were literate (60%) and similar finding was observed in the study conducted by Okwuosa JC et al[17].

In the present study we found statistically significant association between total perceived social support and medication adherence (x2 p). The higher the social support the higher the medication adherence was observed. Similar findings were reported by of Okwuosa JC et al[17] and Hamidreza KTet al [24,] Arulmozhi S et al[25], Linni Gu et al[16].

In the present study majority of study participants (58%) had high social support and similar finding was observed in the study conducted by Ojewale et al [26] (59.9%) and this finding is higher than study conducted by Okumagba PO[27] (21.9%). In the present study majority of study participants were females, married, newly diagnosed, with no hobbits which may be the reason for the hogher social support. This study finding is lower than the study conducted by Ayonote Uzoramaka Angela et al[28] (92.5%) and Iloh & Amadi[29] (77.5%). This difference in observation was due to the study setting, the present study was community-based study compare to previous studies[28,29] which have been conducted in hospitals.

In the present study none of the study participants had high medication adherence but similar dtusies conducted reported high adherence by Ayonote Uzoramaka Angela et al[28] (50%), Jeby Jose Olickal[30] (29%) and lower than Dadhich J et al[31] (66%). This difference in observation was due to the study setting, the present study was community-based study compare to previous studies[26,28,29] which have been conducted in hospitals.

In the present study we found that factors like age, sex, residence, education, occupation, socioeconomic status, marital status, duration of diabetes, habits, body mass index, family history, glycaemic status and health insurance had no statistically significant association with Medication Adherence and similar finding was observed in the study conducted by Linni Gu et al[16]. Factors like sex, occupation, health insurance and glycaemic status were statistically associated social support.

Conclusion

Social support plays an important role in promoting medication adherence among diabetes patients. This

emphasizes the important role of family and friends in the management of type 2 diabetes mellitus which necessitates the establishment of supportive environment and modification of behaviour in promoting patients' medication adherence, healthy diet and other self -care practices.

RECOMMENDATIONS

Social support improves treatment outcomes and reduces unpleasant impact of diabetes mellitus. Health care professionals should stress on the importance of role of family, friends or social support groups in the management of diabetes mellitus. For people with type 2 diabetes mellitus with poor medication adherenece routine monitoring of perceived social support is needed.

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