

“Even though Doctor has Advised to Practice Foot Care I have not Practiced Soaking Feet in Lukewarm Water so Far” Self-care Practices, Enablers, and Barriers: A Mixed Methods Study among Individuals with Diabetes from a Rural Area of South India

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Abstract

Background: Self-efficacy is the ability by which a person confronts problems in day-to-day life with goal-centered attitude. The clinician plays a vital role in promoting self-care though a series of social, cultural and economic factors also contribute positively towards it. This study was conducted to assess the self-care practices among diabetic individuals aged 30 years and above and to understand its enablers and barriers. **Materials and Methods:** Explanatory mixed method study was conducted from August 2018 to October 2020. Quantitative assessment was done wherein a questionnaire was administered to 297 study participants enrolled by simple random sampling followed by in-depth interviews by purposive sampling as qualitative component. Multivariate logistic regression analysis was used to study the relationship of independent variables with various domains of self-care practice. *P* value <0.05 was considered as statistically significant. **Results:** Study found educational status, occupation and religion had a statistically significant association with self-care practices. Regular physical activity, good dietary practices and family support were a few enablers, whereas lack of awareness, time constraints, co-morbidities and environmental factors were some of the barriers to self-care practice. **Conclusions:** In the present study, self-care practice in terms of diet and physical activity were found to be good whereas blood sugar level monitoring and foot care practices were poor.

Keywords: Diabetes mellitus, foot-care, physical activity, SDSCA, self-care

INTRODUCTION

Diabetes is a global health challenge of the 21st century with a prevalence of 9.1% and accounting for 5 million deaths annually.^[1,2] As per the National Family Health Survey (NFHS-5) report, 13.5% of the population residing in rural areas had high or very high (>140 mg/dl) blood sugar levels or were taking medicines for the same.^[3] Diabetes statistics worldwide may exceed 700 million by 2025 with an estimated number of 51 million cases in 2010 in India.^[4,5] The Indian Council of Medical Research describes lifestyle modification including information on healthy dietary practices and sufficient physical activity as the first line of management for type 2 diabetes. These practices are aimed at improving health through optimum

nutrition, maintaining a reasonable body weight, glycemic control, optimum blood lipid levels, physical activity, foot care, behavioral changes for substance use control, and appropriate stress management strategies.^[6] This study was conducted using

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mixed methods design to identify the enablers and barriers for self-care practice in diabetes and to explain its perception among the study participants by qualitative assessment using in-depth interviews. Understanding the reasons behind their behavior of self-care practices is critical to plan appropriate need-based interventions to address the barriers and nurture the enabling factors.

MATERIALS AND METHODS

The medical college where the study was conducted provides preventive, promotive, curative, and referral services to defined urban and rural areas within 30 km radius of the institute as a part of the governing council regulations. Ambalamogaru and Kumpala were the rural field practice areas under the institute where the study was conducted. Individuals aged 30 years and above diagnosed with diabetes mellitus for a minimum period of past 1 year as a part of opportunistic screening done at the primary health centers (PHCs) of Ambalamogaru and Kumpala village were included in the study. The list of eligible individuals was obtained from the PHC who were diagnosed with diabetes mellitus from December 2017 to November 2018. Required numbers of subjects were enrolled by simple random sampling. Ethical clearance was obtained from the institutional ethics committee (YEC 2/147). Pregnant and lactating women, critically ill patients, and individuals with limitations to perform activities of daily living were excluded from the study. The sample size of 297 was calculated assuming that 50% of the subjects in the population follow self-care practices with an expected response rate of 90%, 6% absolute precision, and 95% confidence interval.^[7]

An explanatory mixed methods study was conducted from August 2018 to October 2020.

A cross-sectional study design was used for quantitative assessment with a semi-structured questionnaire to gather information about socio-demographic, socio-economic, and clinical profiles. The revised version of Summary of Diabetes Self Care activities (SDSCA) questionnaire^[8] was modified as per the findings of the pilot study and local needs and validated consensually by five subject experts^[1,8,9] to collect information about self-care practices of the participants. The questionnaire for quantitative data was transcribed and translated in local language and back-translated to English within 48 hours after each session. Each interview lasted for 15 to 20 minutes.

The revised version of Summary of Diabetes Self-care Activities is a brief 11-item questionnaire with key parameters on diet, physical activity, foot care, blood sugar monitoring, and tobacco use. Participants were asked about their self-care practices with respect to the past 7 days.

Scores of the study participants were graded from 0 to 7 owing to the number of self-care practices in the past 7 days.

Diet (3 domains): score (0–21), each domain with questions on eating plan, consumption of fruits, vegetables, and fat.

Physical activity (1 domain): score (0–7), on number of times involved in 30 minutes moderate physical activity

Blood sugar monitoring (1 domain): score (0–7), on blood sugar check-up for the past 7 days.

Foot care (2 domains): score (0–14), on checking of feet and checking the inside of shoes for the past 7 days.

The median score was obtained for each domain, and participants who scored above the median value were categorized as having a good score and participants who scored equal to or less than the median value were categorized as having a poor score.

Based on the findings of the cross-sectional study, an in-depth interview guide was formulated and validated as a part of qualitative assessment. The purposive sampling method was used to select participants based on their scores (very good and very poor) for in-depth interviews, and after 24 interviews, information saturation was attained. Each interview lasted for 25 to 30 minutes. In the present explanatory mixed methods study, the quantitative data collection was done in the community person-to-person with written informed consent. Since qualitative data collection followed quantitative assessment, the coronavirus disease 2019 (COVID-19) pandemic restrictions necessitated the telephonic mode of qualitative data collection among 24 participants after taking verbal consent. However; post the easing of restrictions, the PI contacted the participants and obtained their written informed consent abiding by the ethics guidelines during the pandemic. The Principal investigator, who is trained in qualitative research, conducted in-depth interviews telephonically with consenting patients in local language at a mutually convenient date and time after explaining the objectives and nature of the study. At the end of each session, participants were debriefed and given opportunity for clarifications, if any. Key observations of the in-depth interview were summarized to the participants to confirm and validate the information elicited during in-depth interview. All in-depth interviews were transcribed and back-translated to English on the same day of the interview. The analysis was done after every interview, and the findings were shared among the four researchers. This was done to identify the emerging themes and areas that needed further probing in future interviews. This iterative process helped to assess the saturation of findings. The transcripts and the analysis done by two investigators (RT and AN) were reviewed by two more investigators (PN and NN) to reduce subjectivity in analysis and increase interpretive credibility. Any difference between the researchers was resolved by discussion and consensus. Data were entered in MS Excel, and analysis of frequencies, proportion, and median was done in IBM SPSS version 23.

Univariable logistic regression analysis was used to study the relationship of independent variables with various domains of self-care practice and expressed in terms of unadjusted odd's ratio. Multi-variable logistic regression analysis was used to obtain adjusted odds ratio. A *P* value of < 0.05 was considered

for statistical significance. Quantitative data were reported as per ‘Strengthening the reporting of Observational studies in epidemiology’ (STROBE) guidelines, and in-depth interviews were conducted in the vernacular language using an interview guide modified after the quantitative data analysis.^[10]

A thematic content analysis by manual coding was done to generate various categories or themes under the broad topics: enablers and barriers for self-care practices. Content analysis was reported as per ‘Consolidated Criteria for Reporting Qualitative Research’ (COREQ) guidelines.^[11]

RESULTS

Quantitative findings

Among 297 study participants, the majority, 102 (34.3%), of the participants belonged to 60–69 years of age and 160 (54%) were females. Only 10 (3.4%) participants had education above the higher secondary level, 115 (38.7%) participants were unemployed, 238 (80.1%) study participants had a BPL ration card, and 140 (47.1%) followed Hinduism. Among 297 study participants, 78 (26.2%) had a history of tobacco use and 33 (11.1%) gave a history of alcohol consumption, at least once in a lifetime. Study participants having a history of diabetes for more than 5 years were 125 (42%). Among the study participants, 236 (79.5%) were on oral hypoglycemic agents (OHAs), 18 (6%) were on insulin, and 43 (14.5%) were on both OHA and insulin.

The diet domain had a score from 0 to 21 with a median of 9 and an inter-quartile range of 8 at 25% and 10 at 75%. The physical activity domain had a score from 0 to 7 with a median of 3 and an inter-quartile range of 3 at 25% and 4 at 75%. The monitoring of the blood sugar domain had a score from 0 to 7 with a median of 2 with an inter-quartile range of 1 at 25% and 2 at 75%. The foot care domain had a score of 0–14 with a median of 3 and an inter-quartile range of 3 at 25% and 4 at 75%.

On applying logistic regression, participants following Christianity had 3.13 odds of self-care practice when compared to other religions and this was found to be statistically significant. Study participants who were educated up to secondary school or above had 6.98 times odds of practicing physical activity when compared to participants who were illiterate, and this was statistically significant. Participants who were employed had 2.22 times odds of practicing physical activity, 2 times higher odds of monitoring their blood sugar, and 2.13 times higher odds of foot care practice when compared to their unemployed counterparts, and these associations were found to be statistically significant [Tables 1–4]. Participants who had a history of diabetes for more than 5 years had 0.42 odds of practicing physical activity when compared to participants who had diabetes for 5 years or less, and this association was statistically significant [Table 2].

Qualitative findings

To find out the enablers and barriers with respect to self-care practices, thematic manual analysis was done and results were categorized [Figure 1].

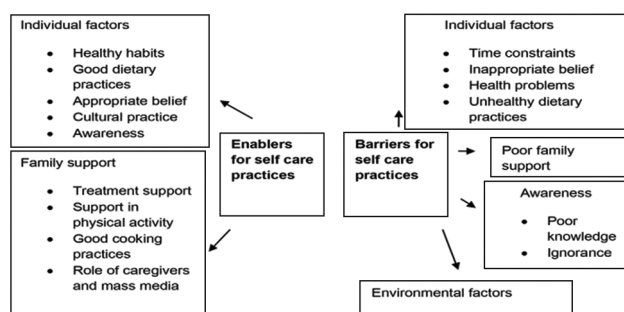


Figure 1: Enablers and barriers for self-care practices in diabetes, $n=24$

Theme 1: Individual factors

Healthy habits

Physical activity in the form of walking was considered essential to control diabetes by most of the participants. As such, the participants who indulged in physical activity after having diagnosed with diabetes mellitus took it up as a part of their daily routine habits.

‘I go walking to shop whenever required to get grocery and vegetables and to fetch wood.’ (male patient, 60 years).

Though overall knowledge about foot care was found to be poor, a few participants had healthy foot care practices like screening the feet using a mirror at bedtime and not being barefooted.

A male responded (49 Years), ‘I wear footwear whenever going out and don’t go out barefooted’.

‘I see my feet for minor wounds though I do not use a mirror’ (female, 50 years).

Good dietary practices

Most of the participants were of the opinion that sweets, sugar, and diet rich in carbohydrates could worsen their diabetic status. They also mentioned that good diet control had an overall positive impact on their health status.

A 49-year-old male respondent told, ‘I drink sugarless tea’. Similarly, a 60-year-old female respondent told, ‘I eat food stuffs made of wheat at night’.

To avoid monotony in diet, a few participants said that they cook a balanced meal so that each nutrient is available in optimum quantities. A few participants also reported that they minimized the portion of every meal and increased the frequency between meals so that they do not remain hungry.

Appropriate beliefs

Participants reported various rational and appropriate beliefs as quintessential in controlling their blood sugar levels. Most of the participants mentioned that adequate nutrition and physical activity prevented development of complications and other hypoglycemic symptoms.

‘I do physical exercise daily. It helps in preventing heart attack and kidney damage’ (male, 38 years).

Table 1: Relationship of dietary practice with selected sociodemographic and clinical variables. *n*=297

Socio demographic Profile	Category	Score		<i>P</i>	Unadjusted odd's ratio (95% CI)	<i>P</i>	Adjusted odd's ratio (95% CI)
		Good	Poor				
Age group (in years)	30-39	2	5	0.08	Ref	0.20	Ref
	40-49	12	32	0.94	0.93 (0.16-5.49)	0.95	1.06 (0.17-6.61)
	50-59	31	57	0.72	1.36 (0.25-7.42)	0.78	1.27 (0.22-7.46)
	60-69	42	60	0.51	1.75 (0.32-9.45)	0.55	1.72 (0.28-10.33)
	70 and above	11	45	0.58	0.61 (0.10-3.58)	0.63	0.62 (0.08-4.36)
Gender	Male	39	98	1.00	Ref	1.0	Ref
	Female	59	101	0.12	1.47 (0.89-2.39)	0.12	1.54 (0.88-2.69)
Educational status	Illiterate	16	31	0.90	Ref	0.44	Ref
	Primary	46	99	0.77	0.90 (0.45-1.81)	0.23	0.61 (0.26-1.39)
	Secondary and above	36	69	0.98	1.01 (0.49-2.09)	0.22	0.54 (0.20-1.46)
Occupational status	Unemployed	36	79	1.00	Ref	1.00	Ref
	Employed	62	120	0.62	1.13 (0.69-1.87)	0.99	1.00 (0.51-1.95)
Type of ration card	BPL	73	165	1.00	Ref	1.00	Ref
	APL	25	34	0.09	1.66 (0.92-2.98)	0.08	1.84 (0.92-3.69)
Religion	Islam	35	93	0.03	Ref	0.03	Ref
	Hinduism	48	92	0.22	1.38 (0.82-2.33)	0.09	1.60 (0.92-2.78)
	Christianity	15	13	0.009 [#]	3.06 (1.32-7.09)	0.01 [#]	3.13 (1.27-7.71)
Duration of Diabetes (in years)	Up to 5 years	62	110	1.00	Ref	1.00	Ref
	>5 years	36	89	0.19	0.72 (0.44-1.18)	0.25	0.71 (0.39-1.28)

*Binary logistic regression is employed for obtaining the odds ratio. [#]Statistically significant**Table 2: Relationship of physical activity practice with selected sociodemographic and clinical variables, *n*=297**

Sociodemographic profile	Category	Self-care practice score		<i>P</i>	Unadjusted odd's ratio (95% C.I)	<i>P</i>	Adjusted odd's ratio (95% C.I)
		Good	Poor				
Age group	30-39	6	1	0.000	Ref	0.13	Ref
	40-49	27	17	0.237	0.26 (0.03-2.39)	0.30	0.28 (0.02-3.11)
	50-59	50	38	0.168	0.22 (0.02-1.89)	0.30	0.28 (0.03-3.07)
	60-69	49	53	0.089	0.15 (0.02-1.32)	0.42	0.37 (0.03-4.02)
	70 and above	9	47	0.003 [#]	0.03 (0.003-0.29)	0.09	0.11 (0.01-1.39)
Gender	Male	78	59	1.00	Ref	1	Ref
	Female	63	97	0.003 [#]	0.49 (0.31-0.78)	0.08	0.61 (0.34-1.07)
Educational status	Illiterate	7	40	0.000	Ref	0	Ref
	Primary	58	87	0.003 [#]	3.81 (1.59-9.08)	0.16	1.99 (0.75-5.31)
	Secondary and above	76	29	0.000 [#]	14.97 (6.03-37.19)	0.001 [#]	6.98 (2.29-21.29)
Occupational status	Unemployed	31	84	1.00	Ref	1	Ref
	Employed	110	72	0.000 [#]	4.14 (2.49-6.87)	0.020 [#]	2.22 (1.13-4.36)
Type of ration card	BPL	107	131	1.00	Ref	1	Ref
	APL	34	25	0.083	1.66 (0.93-2.96)	0.166	0.59 (0.28-1.24)
Religion	Islam	60	68	0.954	Ref	0.716	Ref
	Hinduism	67	73	0.872	1.04 (0.64-1.68)	0.521	1.21 (0.68-2.14)
	Christianity	14	14	0.764	1.13 (0.50-2.56)	0.774	0.86 (0.31-2.36)
Duration of Diabetes (in years)	Up to 5 years	97	75	1.00	Ref	1	Ref
	>5 years	44	81	0.000 [#]	0.42 (0.26-0.67)	0.52	0.82 (0.44-1.52)

*Binary logistic regression is employed for obtaining the odds ratio. [#]Statistically significant

'I develop gastritis when I don't eat at times. So, I eat food timely.' (male, 53 years).

Cultural practices

Culture was seen to be an important factor in inculcation of positive habits related to foot care in many participants. A few participants mentioned that cultural practices like washing the

feet before entering the house and offering prayers enable them to practice proper foot care.

'I normally keep my feet clean Doctor, as we have to perform Wudu' (washing themselves in a certain order starting from hands and finally their ankles and feet) during religious prayers (Namaz) 5 times a day (male, 49 years).

Table 3: Relationship of blood sugar monitoring practice with selected sociodemographic and clinical variables, n=297

Sociodemographic profile	Category	Self-care practice score		P	Unadjusted odd's ratio (95% CI)	P	Adjusted odd's ratio (95% CI)
		Good	Poor				
Age group	30-39	1	6	0.264	Ref	0.612	Ref
	40-49	8	36	0.802	1.33 (0.14-12.66)	0.898	1.16 (0.01-12.10)
	50-59	21	67	0.569	1.88 (0.21-16.52)	0.728	1.495 (0.15-14.38)
	60-69	14	88	0.967	0.95 (0.11-8.54)	0.867	0.81 (0.08-8.39)
	70 and above	6	50	0.778	0.72 (0.07-7.04)	0.729	0.64 (0.05-7.81)
Gender	Male	25	112	1.00	Ref	1	Ref
	Female	25	135	0.547	0.83 (0.45-1.52)	0.951	1.02 (0.51-2.02)
Educational status	Illiterate	6	41	0.352	Ref	0.934	Ref
	Primary	22	123	0.685	1.22 (0.46-3.22)	0.712	0.81 (0.26-2.50)
	Secondary and above	22	83	0.233	1.81 (0.68-4.81)	0.75	0.81 (0.22-2.91)
Occupational status	Unemployed	13	102	1.00	Ref	1	Ref
	Employed	37	145	0.046 [#]	2.00 (1.01-3.95)	0.723	1.17 (0.48-2.80)
Type of ration card	BPL	35	203	1.00	Ref	1	Ref
	APL	15	44	0.05	1.97 (0.99-3.93)	0.497	1.31 (0.60-2.83)
Religion	Islam	22	106	0.976	Ref	0.99	Ref
	Hinduism	23	117	0.868	0.94 (0.49-1.79)	0.95	0.97 (0.48-1.95)
	Christianity	5	23	0.932	1.04 (0.36-3.05)	0.921	1.06 (0.34-3.27)
Duration of diabetes (in years)	Up to 5 years	30	142	1.00	Ref	1	Ref
	>5 years	20	105	0.74	0.90 (0.48-1.67)	0.861	1.07 (0.48-2.40)

*Binary logistic regression is employed for obtaining the odds ratio. [#]Statistically significant**Table 4: Relationship of foot care practice with selected sociodemographic and clinical variables, n=297**

Sociodemographic profile	Category	Self-care practice score		P	Unadjusted odd's ratio (95% CI)	P	Adjusted odd's ratio (95% CI)
		Good	Poor				
Age group (in years)	30-39	2	5	0.02	Ref	0.07	Ref
	40-49	11	33	0.84	0.83 (0.14-4.92)	0.95	1.06 (0.16-6.94)
	50-59	45	43	0.26	2.61 (0.48-14.21)	0.22	3.10 (0.51-18.81)
	60-69	40	62	0.57	1.61 (0.29-8.72)	0.34	2.43 (0.39-15.13)
	70 and above	16	40	1.00	1.00 (0.17-5.69)	0.72	1.42 (0.20-10.02)
Gender	Male	53	84	1.00	Ref	1.00	Ref
	Female	61	99	0.92	0.97 (0.61-1.56)	0.75	1.09 (0.63-1.88)
Educational status	Illiterate	22	25	0.01	Ref	0.01	Ref
	Primary	43	102	0.03 [#]	0.47 (0.24-0.94)	0.003 [#]	0.29 (0.12-0.66)
	Secondary and above	49	56	0.98	0.99 (0.49-1.98)	0.13	0.48 (0.18-1.26)
Occupational status	Unemployed	32	83	1.00	Ref	1.00	Ref
	Employed	82	100	0.003 [#]	2.13 (1.28-3.512)	0.03 [#]	2.12 (1.07-4.19)
Type of ration card	BPL	86	152	1.00	Ref	1.00	Ref
	APL	28	31	0.11	1.59 (0.89-2.83)	0.78	1.10 (0.56-2.15)
Religion	Islam	47	81	0.63	Ref	0.91	Ref
	Hinduism	54	86	0.76	1.08 (0.66-1.77)	0.76	1.09 (0.63-1.87)
	Christianity	13	15	0.34	1.49 (0.65-3.41)	0.70	1.19 (0.49-2.91)
Duration of diabetes (in years)	Up to 5 years	71	101	1.00	Ref	1.00	Ref
	>5 years	43	82	0.23	0.74 (0.46-1.20)	0.14	0.64 (0.36-1.16)

*Binary logistic regression is employed for obtaining the odds ratio. [#]Statistically significant

Awareness due to previous medical/surgery history: Role of doctor

The participants with a previous history of surgery or co-morbidity reported to have better self-care practices and attributed it to the advice given by their treating doctor. The participants with chronic illness along with diabetes mentioned

that regular physical exercise, yoga, or physiotherapy could help them to prevent further deterioration of their health.

A 38-year-old female participant responded, 'Yes, I do exercise daily. I had an operation in my right breast. As advised by my doctor, I exercise lifting my hands up to shoulder and legs up to hip back and forth'.

‘I do physiotherapy because I had a history of fall 12 years back and had got operated for the same’. (male, 70 years).

Theme 2: Family support

Treatment support

Support from family members was also found to be an important enabler for self-care practices. Some participants reported that their family members remind them about the timely intake of medicines and also help them in regular purchase of the medication which enabled adherence to the drug therapy. Some of the participants mentioned that they received family support in making visits to the family physician for periodical checkups.

‘My wife takes care of my health more than myself’ (male, 37 years).

A 47-year-old female patient responded, ‘My children help me in taking to doctor as and when required’.

‘My son helps me in taking insulin’ (male, 72 years).

Support in physical activity

Most of the participants mentioned that they received support in doing physical activity from family members and caregivers. Some participants were taught how to do fitness exercises by their children.

‘My son teaches me to do physical exercise like stretching arms and legs’ (male, 51 years).

Good cooking practices

The participants mentioned healthy cooking practices by their caregivers in improving their health status. Some of the participants reported that they could follow a separate diabetic diet as it was encouraged by the family.

‘Chapattis are made separately for me at home. My wife cooks and gives it separately for me as much as possible’. (male, 41 years).

Role of mass media

Mass media played a pivotal role in imparting adequate knowledge to the study participants about physical activity and harmful effects of substance use.

‘I used to consume alcohol before, but after the onset of diabetes, I have stopped consuming alcohol’. (female, 59 years).

‘I learnt yoga, breathing exercises and other physical exercises from TV’. (male, 65 years).

Theme 3: Barriers for self-care practices

Several individual factors like time constraints, unhealthy dietary practices, inappropriate beliefs, and existing health problems were reported to be the barriers for practicing self-care.

‘I don’t have separate time for physical activity. I go for work early morning by 7 am and return late evening by 7 pm. Will be tired by then and don’t find time for physical exercise’ (male, 37 years).

A few participants had certain myths regarding diabetic diet.

‘I don’t eat chapati much as it heats up my body’ (male, 38 years).

‘I can’t eat much as I have issues of constipation. So, I don’t feel like eating and don’t have taste for most of the food items’ (male, 52 years).

Most of the participants could not do physical activity due to pain, age-related factors, and other co-morbid conditions like hypertension.

‘I don’t do other work because I have a history of hypertension, diabetes and heart disease and is on medication for the same; as such, I find myself weak to do any further activity’, responded a 63-year-old female participant.

A 52-year-old male patient told, ‘I can’t walk much as I feel breathless.

‘Due to my pain in the joints of right leg and dilated veins in the lower limb, I’m not able to walk much’ (female, 47 years).

Environmental factors

A few participants consider environmental factors like COVID-19 pandemic as a restriction for movement. As a result, it was reported as one of the reasons for not walking and having regular follow-ups, which were supposedly done regularly otherwise.

‘I used to go regularly to the hospital for checkup and to buy medicines, but now, you know the situation. People are directed to sit indoors.’ (male patient, 41 years)

‘Before the pandemic started, we had a group who were walking in the evening. This pandemic has put a halt to it. My friends don’t come out to walk for the fear of getting Corona, even me’. (female, 52 years).

Poor family support and unhealthy dietary practices

Poor family support was reported as one more hindrance in practicing self-care. Some responded that it was difficult for the family members to cook exclusively for them due to lack of time.

‘My wife doesn’t cook food separately for me as she has other family obligations also and due to lack of time’ (male, 49 years).

Lack of awareness

Some of the participants attributed lack of awareness as a factor for not practicing self-care to control diabetes mellitus.

In a few participants, though knowledge was imparted by the treating doctor, practice regarding foot care was found to be poor.

— ‘Even though doctor has advised to practice foot care I have not practiced soaking feet in lukewarm water so far’ (male, 51 years).

DISCUSSION

The present study highlights the importance of blood sugar monitoring and foot care practice, which is overlooked among the majority of the study participants. Among 297 study participants, 183 (61.6%) of them had a poor score with regard to the foot care domain and 247 (83.1%) study participants had poor blood sugar monitoring scores. This is consistent with the study findings conducted by Mohandas *et al.*^[2] in a resettlement colony in East Delhi, wherein 155 patients (92.3%) had not practiced blood sugar testing at all and about 80.4% of the study participants did not practice foot care for even a single day in the past 1 week. In a similar study conducted by Dinesh *et al.*^[9] in Sullia, Karnataka, it was observed that checking the feet daily and monitoring the inside of shoes/footwear daily were the two practices which were not followed by the majority of the study participants, which accounted for 99.5%. On the contrary, in a hospital-based study conducted by Rajasekharan, *et al.*^[12] in Mangaluru, the majority of the study participants, 64.8% (188/290), washed their feet daily, possibly due to increased awareness about treatment modalities and better compliance among patients visiting the hospital than the general community.

With regard to dietary practices, among the 24 in-depth interviews conducted, 15 participants (62.5%) had good knowledge that carbohydrate-rich diet could worsen their diabetic status. Family support was found to be an important positive factor for self-care practice similar to a study by Mohandas *et al.*,^[2] which highlights the need of involving family members in taking health care decisions for the patient. Some of the reasons for not being able to follow diet would be their food habits which were practiced since childhood.

In the present study, participants who had completed secondary school education had 14.97 odds of practicing physical activity when compared to illiterate participants and female participants had 0.49 odds of practicing physical activity when compared to male participants with statistically significant results. This finding was similar to a study by Basu *et al.*,^[13] wherein on applying logistic regression, low literacy level and female gender were significantly associated with lower physical activity.

On exploring further through in-depth interviews, among 24 participants, it was found that physical exercise in the form of walking was considered good for health by 14 (58.3%) participants. In the study by Sanghamitra Pati *et al.*, personal facilitators to perform physical activity included control of diabetes, 'to feel good and stay fit', while external facilitators included the physician's advice and company for doing exercise.^[14] Some of the working study participants reported lack of time and tiredness as the reasons for not doing physical activity daily. Similarly, in a study by Sanghamitra Pati *et al.*, personal challenges in performing physical activity included lack of time, sedentary habits, and lethargy.^[14]

Only six participants (2%) conducted daily self-testing of blood sugar levels. Non-availability of a glucometer was cited

by 10% of the participants during quantitative data collection as the reason for not checking blood glucose levels regularly. Though not part of in-depth interview guide, when probed further during qualitative data collection, non-affordability was one of the reasons mentioned. The participants also reported that accessibility to health care facility was one of the important factors for regularity in blood sugar check-up. This finding was similar to a study conducted by Mohandas A *et al.*,^[2] where out of all subjects, 155 participants (92.3%) did not practice blood sugar check-up at all in the last 1 week. In the present study, 183 study participants (61.6%) did not follow foot care practice due to lack of awareness about the importance of foot care in diabetes control. When further explored, it was found that whoever practiced foot care was following it due to their cultural practices or as advised by the treating physician to control fungal infection or scabies of feet.

The in-depth interview cited inadequate knowledge regarding foot care as one of the reasons for not practicing it. Dakshina Kannada district has the highest literacy rate. However, this will not determine the health literacy and more so the healthy preventive practices. Various studies done in India also reported very low levels of foot care practice in the study participants, which was consistent with the present study.^[1,2,15,16] Behavior change communication strategies are required to improve the knowledge and practices regarding self-care among individuals with diabetes.

CONCLUSION

In the present study, overall self-care practice of study participants was found to be satisfactory. Self-care practices in terms of diet and physical activity were found to be good, whereas foot care practice and monitoring of blood sugar levels were found to be poor.

Strengths

This was a community-based explanatory mixed method study which helped in providing insight to the reasons for the compliance or defiance in terms of diabetes self-care practices.

Limitation

The study was limited to two rural field practice areas of the teaching institution, and external validity is limited.

Recommendations

Regular self-care practice is recommended in order to prevent long-term complications and improve the quality of life in affected patients. Diabetes support groups should be formed to train the patients and reinforce the importance of self-care practice with special emphasis on foot care. Also, as a part of health promotion measure, glucometers should be made easily accessible to the diabetic individuals at their nearest Anganawadi centers or through their periodic home visits of ASHAs.

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Conflicts of interest

There are no conflicts of interest.

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QUESTIONNAIRE

A. Quantitative Data-

Part I: Socio demographic details

1. Name:
2. Age group (years):
 - i) 30-39
 - ii) 40-49
 - iii) 50-59
 - iv) 60-69
 - v) ≥ 70
3. Gender:
 - i) Male
 - ii) Female
4. Educational status:
 - i) Illiterate
 - ii) Primary
 - iii) Secondary and above
5. Occupational status
 - i) Unemployed
 - ii) Employed
6. Type of ration card:
 - i) BPL Card
 - ii) APL Card
7. Religion
 - i) Islam
 - ii) Hinduism
 - iii) Christianity
8. Duration of illness (in years)
 - i) ≤ 5 years
 - ii) > 5 years
9. History of tobacco use
 - i) Yes
 - ii) No
10. History of alcohol consumption
 - i) Yes
 - ii) No
11. Type of treatment
 - i) Oral hypoglycemic agents
 - ii) Insulin
 - iii) Both

Part II: Revised SDSCA Questionnaire modified -

SDSCA Questionnaire—

The questions below ask you about your diabetes self-care activities during the past 7

days. If you were sick during the past 7 days, please think back to the last 7 days that you were not sick.

1. Diet (3 questions)
- I) On an average, how many DAYS PER WEEK have you followed your eating plan?

0	1	2	3	4	5	6	7
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- II) On how many of the last SEVEN DAYS did you eat five or more servings of fruits and vegetables?

0	1	2	3	4	5	6	7
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- III) On how many of the last SEVEN DAYS did you eat high fat foods such as red meat [beef, lamb and mutton, pork, veal, venison and does not include chicken, turkey, duck, goose, game birds and rabbit] or full-fat dairy products?

0	1	2	3	4	5	6	7
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2. Exercise

- I) On how many of the last SEVEN DAYS did you participate in at least 30 minutes of moderate physical activity [walking briskly (about 5-6 KM in an hour), climbing, gardening/yard work, dancing, walking short distances for fetching milk and vegetables, bicycling (about 16 KM in an hour), and weight training (a general light workout), yoga asanas and pranayama, playing with children]

0	1	2	3	4	5	6	7
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3. Blood sugar testing

- I) How frequently over the past 1 month have you checked your blood sugars?

0	1	2	3	4	5	6	7
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4. Foot care

- I) On how many of the last SEVEN DAYS did you check your feet?

0	1	2	3	4	5	6	7
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- II) On how many of the last SEVEN DAYS did you inspect the inside of your shoes?

0	1	2	3	4	5	6	7
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B. Qualitative Data

Part III: In depth interview guide

- What is your opinion about regular physical activity (exercise, walking) for individuals with diabetes?
[Probes: What type of physical activities you do, how will you do it, what motivates you to do it, what challenges you face- health issues, loss of wages]
- What are the factors which help you in following the diet as advised by your physician? What are the challenges you face in following the diet?
[Probes: Family support, it is difficult to cook separately for the patient]
- Will you please briefly tell me about your daily routine activities?
[Countercheck diet and physical activity] Are you able to follow it most of the days? If only sometimes, how many days in a week? What are the challenges you face in carrying out your daily routine activities?
- What is your opinion that anybody else other than family members have helped you in your diabetic status?
[Probe: Self-help groups]
- What is the importance of foot care in diabetes? How do you carry about foot care?
[Probes: Soaking feet in lukewarm water, seeing the inside of feet by oneself using a mirror for minor wounds or ulcers]
What are the challenges you face in carrying out foot care practices? [Probes: forgets often, no enough training]