

Table 4: Impact of expenditure on DM management on family

Effect of DM management on family	Urban (%)	Rural (%)	Total (%)
Squeeze family expenditure to buy drugs*	8 (25.8)	30 (44.7)	38 (38.8)
Burden on family budget*	10 (32.2)	5 (7.4)	15 (15.3)
Sacrifice family needs	6 (19.3)	6 (8.9)	12 (12.2)
Not a burden	7 (22.5)	26 (38.8)	33 (33.6)

*Responses statistically significant ($P < 0.01$). DM: Diabetes mellitus

similar finding was reported by Shah *et al.* (2009) among DM patients attending three health centers in Saurashtra, Gujarat where about 46% of patients knew the pathophysiology of diabetes.^[17] When asked about the awareness on symptoms of DM, it was found that good percentage that is, 87.1% in urban slum area and 91.0% in rural area were able to name at least one symptom of DM. Most common symptom known to patients in both urban slum and rural areas was increased frequency of urination, and least known symptoms were DM being asymptomatic in the urban area and recurrent infections in the rural area. This corresponds to the findings of a study conducted by Mukhopadhyay *et al.* (2010) in Kolkata in which frequent urination was most common symptom known to the patients (42.2%) and being asymptomatic was least commonly known (to only 3.1%).^[18] The possible reason for higher knowledge about DM among rural patients than urban patients in some aspects may be actual suffering from the symptom or complications by rural patients that leads to their diagnosis. Patients in the urban area might be screened by opportunistic screening for DM while contacting some health facility for some other morbidity. Similarly, when asked about the complications of DM, eye and kidney related complications were most common complications known to patients, again corresponding to the finding of previous study.^[18] The majority of patients knew one of the components of management needed for a DM patient. Most commonly known were dietary modifications and drugs as found in the previous study.^[18] Another study has found lacunae in knowledge prevailed in drug therapy of diabetes.^[17] More than 50% of patients in both areas knew that they should get their eye examination done. In another study conducted by Khandekar *et al.* (2010) in Oman, knowledge of eye complications of diabetes was excellent in 72.9% of patients.^[19] Similar findings were given by Rani *et al.* in rural districts of Tamil Nadu in which 65.9% patients had the right knowledge of getting an eye examination done despite no knowledge about diabetic retinopathy.^[10] For some questions like knowledge about complications and management of DM, knowledge was higher in a rural area as compared to urban slum area. This could be because of higher percentage of literates in the rural area of Delhi as compared to urban slum and resettlement colony. Although 58% of patients in urban slum area could tell at least one symptom of hypoglycemia, but patients in both areas reported low knowledge about how to manage hypoglycemic symptoms. In a study carried out by Upadhyay *et al.* (2012) in Nepal, only 10.49% of patients knew symptoms, and only 17.28% patients knew how to manage

hypoglycemic symptoms in their study.^[20] The majority of patients in both areas had no knowledge about overall do's and don'ts for a diabetic patient. Similarly awareness about foot care was also found to be low. The same findings were reported by Matwa *et al.* (2003)^[21] in Eastern Cape Province concerning poor foot care knowledge and practices and Hasnain and Sheikh (2009)^[22] in Lahore where one-third of diabetic patients had poor knowledge about foot care.

Practices

It is a well-established fact that healthy planned eating and regular exercise can delay diabetes and its complications.^[23] Although more than 50% patients in both areas said that they used to exercise (30 minutes of brisk walk for at-least 5 days in a week), not all of them used to exercise daily. This is in line with previous studies; one by Raj and Angadi (2010) in Karnataka in which only 40.68% of the respondents reported to exercising regularly.^[18,24] Dietary adherence findings are also in line with a previous study in which only 1.85% of the respondents used to follow a diet plan "frequently" at home.^[20]

Treatment seeking behavior

The study revealed that 29% of patients in urban and 7.5% of patients in a rural area were not taking any treatment for diabetes. The reason could be higher out of pocket expenditure and higher percentage of patients being unemployed in the urban area. In a study done in rural areas of Tanzania by Baskin (2012) reported 14.9% of the diabetic patients were not taking any treatment at the time of interview. Most common reasons for not taking treatment were lack of money and long waiting hours and queues apart from a distance of health facility from the residence. In the previous study also, cost burden was prime barrier to medications.^[25] Poor availability of transport, physical distance to the health facility and the time taken to reach such facilities have been found to influence health-seeking behavior and health service utilization.^[26]

In the present study, patients were using different systems of medicine apart from allopathic. This is similar to findings of a study carried out by Mehrotra *et al.* in Allahabad, India, which showed that 67.8% of patients were using the alternative system of medicine apart from allopathic system of medicine.^[27]

Economic impact

The International Diabetes Federation, Diabetes Atlas (2006) reported that public mechanisms for financing health care are nonexistent in most developing countries, hence, health costs typically represent out-of-pocket expenditure.^[28] Studies in India, for example, have shown that a low-income family with one adult with diabetes may spend as much as 25% of family income on the care of the patient.^[29] Mean direct annual cost for outpatient care for all patients with diabetes was INR 4724/-, those without complication had 18% lower

cost.^[30] According to Ramachandran (2007), annual expenditure on inpatient care on investigations, physicians fees and medicine were Rs. 6725 (107.29\$), on hospitalization was Rs. 5000 (79.77\$) and transport was Rs. 300 (4.79\$) for diabetes.^[31]

The present study also found that patients have to bear a significant out of pocket expenditure on management of diabetes. Expenditure on drugs and hospitalization was higher than travel. For 66.4% of the patients, the cost of DM management was a burden that is consistent with a previous study where almost all patients considered treatment of DM as a cost burden on their families.^[25]

Conclusion

Although patients have some knowledge about diabetes symptoms and complications, awareness about their management was lacking. Patients need to be made aware of long-term complications of diabetes on eye, heart, kidney, etc., and precautions that should be taken and that they can be prevented. At the same time, efforts should be made to sensitize them about the importance of taking regular treatment. Public health care facilities should be utilized for easy and affordable availability of drugs so that burden of disease on patient family can be reduced.

Strengths and Limitations

The present study focused upon an important emerging disease DM in India. Strengths of the study are its defined objectives, large sample size, use of validated tool and interpretation of results. Treatment compliance, health seeking behavior and expenditure incurred on management were mainstay of results. Possible limitations are rural study area chosen may not be representative of rural areas in other states in India due to the difference in pace of urbanization and health care facilities available in Delhi and other states.

Multi centric studies should be conducted in future so as to get the results with better external validity. Policy level changes can be undertaken to plan interventions to raise awareness, compliance, better availability of cheaper drugs and comprehensive health education services at the primary health centers.

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