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Financial Coping Mechanisms in Patients with Type II Diabetes Mellitus in Rural India

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ABSTRACT

Background: Understanding the financial burden and the pattern of costs involved in managing diabetes can help planners strengthen the basic health care programs. The present study was carried out to assess the cost of diabetes care and the financial coping mechanisms thereof.
Methods: The present study was carried out in the rural areas of district Tumkur, Karnataka. A total of 180 participants were included in this study. Data was collected using a pre-tested questionnaire, which was administered as a face-to-face interview during house-to-house visits by the second author.
Results: The mean age of the participants was 62.68 ± 8.4 years. The mean total direct cost incurred on managing diabetes was 408.12 ± 23.37 INR/month, while as the total indirect cost was 145.88 ± 11.42 INR/month (P<0.001). The total cost incurred during hospitalization was 201600 INR, which when calculated for individual admissions turned out to be 9600 INR. Majority of the people [126 (70%)] mobilized cash savings to cope-up with this financial burden, which was followed by borrowing money from friends /professional lenders in 52 (30%) individuals. None of our study subjects sold any assets to meet this expenditure and none of our patients had access to any health insurance scheme.
Conclusion: The present study points to the ever-increasing cost of diabetes care. The major economic impact of type II DM was due to high cost of the drugs. There is a glaring deficit of social insurance schemes that needs to be addressed.

Key Words: Diabetes Mellitus; Financial; Cost; Rural.

INTRODUCTION

The global prevalence of diabetes has been estimated to be 9% among adults more than 18 years of age. In 2012, an estimated 1.5 million deaths were directly attributed to diabetes mellitus (DM), with more than 80% of these occurring in low and middle-income countries. [1] The World Health Organization projects that diabetes mellitus will be the 7th leading cause of death by the year 2030. [2] DM is a chronic disease that not only drains the body but also drains the pocket of the patient. DM affects quality of life, requires close monitoring and control. The persistent hyperglycaemia and associated complications demand intensive care and frequent visits to health care facilities thus increasing the cost of care. [3] The per capita cost of managing DM is 2 – 4 folds higher than the non-diabetics. [4] Healthcare expenditures on diabetes accounted for 11.6% of the total healthcare expenditure in the world in 2010. By 2030, this amount is projected to exceed USD 490 billion. [5] For obvious reasons, the treatment costs increase with disease duration, presence of complications, and hospitalization.

One of the most bothersome facts is that despite the United Nations raising the status of non-communicable diseases to that of communicable diseases; there is neither support, nor financial risk protection/

exemption for DM, which is presently assuming an epidemic proportion. [6] Every year more than 150 million individuals in the world face financial catastrophe and more than 100 million individuals are pushed into poverty as a direct result of paying for health care related to DM. According to the World Bank, out-of-pocket expenditure in India was one of the highest in the world (around 87%) between 2008-2012 in terms of direct and indirect costs incurred on managing DM, and this was mainly borne by family members of diabetic individuals who used various coping up mechanisms. [7]

Survey data on these coping mechanisms provide overall direction by helping to pinpoint the obstacles in society, region specific issues and weaknesses in services that need to be overcome. Program managers also need to look at the total cost incurred on managing complications of diabetes to gauge whether they need to raise awareness of the benefits of early detection and proper control of blood sugar levels. In the absence of insurance, most of the patients pay out of their own pockets, more so in the rural areas. Hence to address these views, the present study was carried out to assess the financial burden and their coping strategies among patients living with diabetes mellitus in rural India.

MATERIALS AND METHODS

The present observational community based, cross-sectional study was carried out in the rural field practice area of Sri Siddhartha Medical College Tumkur which consists of 23 villages around the rural health-training center (RHTC) located in Nagvelli, and caters to a total population of 8223. This study targeted all the individuals over the age of 30 years who were permanent residents of the area and were living with type-II DM for at least 1 year. Persons with type I DM and those who didn't consent were excluded from the study. The proportion of income spent in rural areas in managing DM as reported elsewhere [7] in rural India was 27%. The sample was calculated by the formula $n = Z^{2*}P*(1-P)/e^2$, where, z = Level of confidence at 95 %(1.96); P = Proportion of income spent and e = Margin of error taken (absolute error of 1.5%). Thus the calculated sample size came out to be 162, which after adding 10% non-response was rounded off to 180. Systematic random sampling did the selection of participants.

A semi-structured pre-tested proforma, which included socio-demographic profile of the participants and questions based on knowledge of DM and its complications, was used. Data was collected using this pre-tested questionnaire, which was administered as a face-to-face interview during house-to-house visits by the second author. Information was specifically collected regarding the financial coping mechanisms used to deal with cost of managing DM. Before the study was formally conducted, this questionnaire was translated into local language and was tested on 30 diabetics of the same area for reliability and consistency as part of a pilot project. The questionnaire was asked in the local language understood to them. If any of the selected individual was not found during the first visit, a second visit was given at some other time.

The data thus collected was compiled and analyzed using SPSS version 21 for Mac (IBM Corporation, 2012). Qualitative variables were expressed as proportions in percentages. For quantitative data, mean and standard deviation was calculated. The association between variables was calculated for 95% confidence intervals by using "Chi square test" and "One-way ANOVA". "Unpaired t – test" was used to compare the means. A P-value <0.05 was taken as significant. All procedures performed in this study were in accordance with the ethical standards of the 1964 Helsinki Declaration and its later amendments or comparable ethical standards. The Institutional Ethical Committee approved this study. All the subjects were fully informed about the purpose and nature of the study. A written

and informed consent was obtained in the language they understood, and assurance regarding confidentiality was given. The study posed no financial burden on the participants.

RESULTS

The mean age of the participants was 62.68 ± 8.4 years. There were more male patients [94(53%)] as compared to females [85(47%)]. Most of the patients were in the age group of 50-59 years [94 (52%)]. Sixty-seven (37%) patients were illiterate and only six (3%) patients were having a diploma degree. One-hundred-and-twenty-six (70%) patients were living in joint families. Agriculture was the predominant occupation and was seen in 86 (49%) patients; but in case of females the predominant occupation was "engaged in homemaking" and was seen in a total of 60 (33%) participants. According to Modified B.G. Prasad's classification of socio-economic status, 74 (41%) patients belonged to class V. Majority of the study subjects [128(71%)] were diabetic for 1-4 years, with mean years of duration being 4.8 ± 1.2 years.

Table 1: Mean Direct and Indirect Costs incurred on managing DM.

Type of Cost	Purpose	Monthly Cost (INR)
Direct Cost	Consultation	160
	Diagnostics	62
	Drugs	186
Total Direct Cost		*408*
Indirect Cost	Wages Lost	70
	Refreshments	5
	Transportation	70
Total Indirect Cost		*145*
TOTAL COST INCURRED		553

The mean total direct cost incurred on managing diabetes was 408.12 ± 23.37 INR/month [Table 1], while as the total indirect cost was 145.88 ± 11.42 INR/month. This difference was statistically significant [P<0.001]. A total of 21 (12%) patients required hospital admissions over the study period for managing DM. The total cost incurred during hospitalization was 201600 INR, which when calculated for individual admissions turned out to be 9600 INR. Majority of the people [126 (70%)] mobilized cash savings to cope-up with this financial burden, which was followed by borrowing money from friends /professional lenders in 52 (30%) individuals. None of our study subjects sold any assets to meet this expenditure and none of our patients had access to any health insurance scheme.

DISCUSSION

Diabetes mellitus imposes a large economic burden on the global health-care system and the wider global economy. This burden can be measured through direct medical costs, indirect costs associated with productivity loss, premature mortality and the negative impact of diabetes on nation's gross domestic product. [8] Direct costs are those generated by the resources used in treating or coping with the condition. It includes expenditures on inpatient treatment, physician and other specialist consultation fees, prescriptions, drugs (insulin and oral hypoglycaemic agents) and, laboratory tests, etc. It also includes any cost incurred on any co-morbidity attributed to DM. While the major diabetes cost drivers are hospital inpatient and outpatient care, a contributing factor to this increase is the rise in expenditure on patented, branded medicines used to treat people with diabetes. Indirect costs of diabetes address the potential resources that are lost as a result of one having diabetes. They include the time absent from work due to illness or attendance to healthcare, inability to work because of disability, cost of transportation, premature mortality because of acute or chronic complication of diabetes, and time taken off work by care takers of the diabetics. [9]

The mean monthly cost of consultation, as reported by our study, is 160 INR, which is more than as reported elsewhere. [7-10] A study conducted in Haryana in 2014, showed that the mean cost of consultation per month was 106 rupees. [7] Another study reported the cost on consultation at 116 rupees per month. [10] Increased cost on consultation in our study could be due to increase in consultation fee by private practitioners over the years. Also

there has been an increase in the awareness to consult a specialist doctor, which may also have contributed to the higher cost.

There is an increase in expenditure on investigations with passing of years. This can be attributed to inflation with the resultant increase in cost of investigations at diagnostic centers and the availability of better and more expensive investigation modalities like HbA1C. In our study, the mean cost incurred on investigations of diabetes is 62 INR/month. Again, this cost was higher than reported earlier. [7-11] Loganathan et al reported a mean expenditure on investigations at 28 rupees per month. [11] A study in northern India showed that the mean expenditure on investigation was 47 rupees. [7] Similar trend was seen as regards the cost of medications; even though the patients were using free drugs available at the rural health centers.

In the present study, total monthly indirect diabetic expenditure is reported at 145 INR, which is comparable to as reported by Kapur et al. [12] Though the cost of transportation and refreshment costs were similar to other reported studies, [7-12] however, the costs incurred due to loss of wages by accompanying persons were much lesser [70 INR] in our study as compared to others. This is probably due to the fact that our study included only rural population and a major chunk of this population was "engaged in homemaking". Hence the wages lost by them were not accounted for. The total cost (direct & indirect) incurred by our subjects was 553 INR/month, which was higher than that reported by Ramachandran et al. [13] This is attributed to the inflation and overall increase of cost of living.

Most of the patients used cash savings as a coping-up strategy, which has also been reported elsewhere. [10-13] But, this carries an important caveat as using money saved for other basic items like food could jeopardize the health of the patients and further push them into poverty because total expenditure is inflated and necessary consumption is temporarily sacrificed to pay for healthcare. Respondents may choose other risky coping mechanisms like skipping appointments, skipping doses of drugs when feeling well, or using alternative healthcare believing it to be cheaper to save or evade the costs, which can lead to catastrophic complications and poor control of diabetes, and thus indirectly increasing the cost. Borrowing and trading out assets may push respondents deeper into poverty especially if borrowed from money lenders as interest on the money will further increase the cost burden while disposal of assets may provide immediate cushion but the persons are denied the value and comfort of their use. Borrowing was preferred to selling out assets in our study.

One of the major findings of our study is the lack of health insurance schemes being used by the rural population, and most of the patients were forced to spend out of their pockets. Thus, there is a need to strengthen the basic health care facilities and the provision of free health care schemes like Ayushman Bharat. Also, the use of generic drugs should be encouraged, to offset the cost of branded medications. Hospitalization costs occur in the setting of diabetes complications, which can be minimized by proper screening and counseling of the patients. There is a need to regulate the cost of investigations by the private diagnostic centers, which can further help in alleviating this financial burden.

Our study has some potential limitations. First, it was not possible to calculate the wages lost by housewives that could have affected the indirect costs. Second, duration of stay in hospitals was not accurately calculated which could affect total hospital expenditure. We agree to the fact that hospitalization could have been due to other reasons and wrongly attributed to DM, owing to recall bias. Our study may also be criticized on the plea that these results cannot be extrapolated to the national or global scenario, as the sample was not a nationally representative one. The strengths of this study were that the subjects were

selected using random sampling technique, which helped to avoid selection bias.

CONCLUSIONS

The present study points to the ever-increasing cost of diabetes care. The major economic impact of type II DM was due to high cost of the drugs, which can be addressed by proper marketing strategies. There is a glaring deficit of social insurance schemes that needs to be given a boost.

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