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Differentials in Health Care Seeking Behaviour and Health Care Expenditure among Diabetes Mellitus Patient in India

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Abstract

The level of morbidity and mortality due to diabetes and its potential complications are enormous and pose significant healthcare burden on both families and society. In India almost 9% people are affected by diabetes mellitus. Furthermore, in recent years, health seeking behaviour of the people has been affected due to increasing Health Care Expenditure. The healthcare burdens in this regard pose a major challenge to the sustainable development goals (SDGs) which are dedicated to decrease one-third of early mortality from non-communicable diseases by 2030 (UN, 2015). The present study aims to examine the socioeconomic and demographic factors that affect Utilization of Health Services and health care expenditure across socio-economic backgrounds of the Diabetes Mellitus patients. The purpose is to identify those vulnerable to these costs and implement policies on improving the health systems. The study used data from the 71st round of the National Sample Survey Organisation (NSSO 2014-2015). Statistical tests of association were conducted to identify the significant variables and bivariate logistic regression was applied to study the effect of these variables on the outcome. The study revealed that there exists a statistically significant difference in utilization of health services and health care expenditure among socioeconomic groups. Rural residents, Scheduled Tribes and poorer sections were the ones who utilize the public health care facilities more. Health care expenditure in private health care facilities was higher as compared to the public health care facilities. It was found that there are considerable Socioeconomic differentials in utilization of health services. Thus, experiencing higher health care expenditure as well as depending more on inefficient mechanism to finance their health expenditure. Considering the Socioeconomic differentials in utilization of health services and health care expenditure, the study recommends that making accessible availability of health care services and implementing policy of public health as first choice for health care, particularly for Rural residents, Scheduled Tribes and poorer sections should be taken as priority. We also suggest reducing health care costs by improving availability of affordable health care facilities for all may go long way in reducing the burden of Diabetes Mellitus epidemic in India.

Introduction and review of literature

Diabetes mellitus constitutes a group of metabolic disorders characterised by hyperglycaemia arising as a result of defects in insulin action or secretion or both [01]. The disease is very challenging to manage as it affects almost all the body tissues giving rise to several comorbidities and complications [02-03]. The WHO global report on diabetes says that the burden of diabetes has almost doubled since 1980s, the age -standardised prevalence in the adult population being 4.7% in 1980s and 8.5% in 2014. To address the growing burden of diabetes, the 'Global Action Plan' for the Prevention and Control of NCDs '2013-2020' was sanctioned over 190 countries under the leadership of the WHO with the aim of reducing the diabetes burden [04-05]. Once thought of as a disease of the affluent sections of the society, this disease is now emerging as a pandemic with India being a major epicentre. Studies have suggested that almost 75% of the diabetic population resides in low and middle-income countries which are expected to witness the highest increase in the burden of this disease. Thus, further contributing to the heightened economic crisis situation for these countries [06].

India is emerging as a diabetes capital on the global map. The country stands at second position after china with over 69 million people suffering from diabetes (IDF, 2013 and IDF, 2015). Around 9.3% Indians are affected by diabetes and the burden is increasing at a daunting rate in the first quarter of the 21st century (IDF, 2013). Hence, it poses a huge challenge to the ambitious target of reducing the premature mortality from NCDs (including diabetes) by 1/3rd as a part of the Sustainable Development Goals (SDG) by 2030 (UN, 2015).

The explosive increase in the burden of Diabetes in the country is to a large extent due to rapid changes in lifestyle associated with increased urbanisation and socioeconomic development. The situation is even more concerning as Indians have a higher likelihood of developing Diabetes, and that too at a lower age and BMI, than rest of the world [07]. Thus, the financial burden of Diabetes, in a developing country like India, is a very crucial subject. Moreover, there are huge differences in both,

the burden of diabetes and availability and quality of health care services as far as the rural and urban parts of India are concerned [07]. Hence, it's very important to know and understand the differentials in health care seeking behaviour and expenditure in India for proper health planning and implementation of health policies.

Need for the Study

A few studies have assessed the basic questions associated to Utilization of Health Services and health care expenditure. In this previous background a few significant questions that need to be studied are as follows:

1. What is condition of Utilization of Health Services and health care expenditure among Diabetes Mellitus Patient in India?
2. Does Utilization of Health Services and health care expenditure vary by socioeconomic backgrounds of patients? If yes, what are the main socio-economic predictors?

To answer the above questions, this study examines the Utilization of Health Services and health care expenditure across socio-economic backgrounds of patients as it plays main role in households' general economic welfare in both short time and long time and finally an evidence would be able to suggestions for policies in strengthening the health care financing and coping strategies of Diabetes Mellitus Patient.

Study Setting, Data and Methods

Data source and sample size

Data related to morbidity, Utilization of Health Services and health care expenditure was retrieved from nationally representative survey data collected by the National Sample Survey Organisation (NSSO 71st round) during January to June 2014 on 'Social Consumption and Health in India'. NSSO is a national organization under the Ministry of Statistics, established in 1950 to regularly conduct surveys and provide useful statistics on socio-economic status of households, demography, health, industries, agriculture, consumer expenditure, etc. NSSO 71st round survey covered 36 states/union territories 4577 villages, 3720 urban blocks and 65 932 households (36480 household in rural and 29452 household in urban). A total, 333 104 persons were interviewed. A stratified multistage sampling design was adopted. The details of the sampling weights as well as extensive information on survey design, data collection, and management procedures are described in the NSS report [08]. In the present study, 3923 patients who had taken treatment from OPD in the last 15 days preceding the survey were analyzed.

Outcome Measurements

This study examines the two main outcomes namely health Care Seeking Behaviour and health care expenditure. For health care seeking behaviour, this study used the information on type of health facility used by Diabetes patient for treatment. Based on the availability of data, the type of health facility is divided into two categories, Public facility and Private facility. For health care expenditure, this study used direct medical costs, indirect medical cost and non-medical expenditure. Total OPD patient health care expenditure comprises both direct medical costs (Doctor's/surgeon's fee, Medicines, Diagnostic tests, Bed charges) and Indirect medical cost (Attendant charges, physiotherapy, personal medical appliances, blood, oxygen, etc.) as well as Non-medical expenditure (Transport for patient).

Defining Predictor Variables

Important Socioeconomic and demographic predictors such as age of persons, education, sex, marital status, religion, social group, wealth quintile, place of residence and regions of residence were included as predictor variables in the present study based on the literature review [09-11].

Analytical approach

To meet the objective this study used the bivariate, multivariate and regression model. In the first step of analysis the multivariate analysis was used to understand the condition and variation of treatment seeking behaviour by selected socioeconomic and background characteristics of Diabetes mellitus patient. Second, the mean health care expenditure (medical cost, non-medical cost, transportations cost and Out of pocket expenditure) for outpatient treatment by selected background

characteristics was carried out. In the third part of analysis the Multivariate analysis using multiple linear regression analysis was carried out to estimate the adjusted effects of selected covariates on out of pocket expenditure for Diabetes mellitus patient by selected background characteristics.

Results

Profile of Diabetes mellitus -affected individuals

Table 1 presents the profile of Diabetes mellitus-affected individuals by their selected socioeconomic and demographic characteristics in India. Results shows that a significant proportion of the sample belongs to the adults aged 41–59 years (more than two third) and older aged 60 years and above (more than two third) were suffering/suffered from Diabetes mellitus. The proportion of self-reported Diabetes mellitus is high in the richest wealth quintile (almost one forth) and only 16 percent belong to the poorest wealth quintile. The southern region of the country as compared to other states had a greater share of diabetic subjects.

Some difference between male and female was also noticed in the pattern of diabetes, with male diabetes patients having a slight higher proportion than females. As far as marital status is concerned, currently married individuals had the highest share of diabetes. Result from the analysis exhibit that share of diabetics was slightly high in urban area as compared to their counterpart rural area.

Table 1. Profile of Diabetes mellitus-affected individuals by their selected socioeconomic and demographic characteristics in India, NSSO 2014

Background Characteristics	Sample #	Weighted proportion	95% CI
Individuals characteristics			
Age (in years)			
15-40	294	08.26	[06.56-10.35]
41-59	1,827	47.96	[44.65-51.29]
60 and above	1,802	43.78	[40.45-47.16]
Education			
Illiterate	1,028	27.69	[24.44-31.20]
Up to Primary	1,005	24.53	[021.6-27.72]
Middle completed	583	14.33	[12.11-16.86]
Secondary and above	1,307	33.45	[30.11-36.98]
Gender			
Male	1,953	51.93	[48.71-55.13]
Female	1,970	48.07	[44.87-51.29]
Marital Status			
Never married	1.48	02.12	[01.22-03.66]
Currently married	78.21	77.43	[74.43-80.17]
Others	20.32	20.45	[17.86-23.31]
Household characteristics			
Religion			
Hindu	2,956	77.66	[73.96-80.98]
Muslim	540	11.10	[08.89-13.77]
Others	427	11.24	[08.65-14.48]
Caste			
ST	116	02.36	[01.47-03.77]
SC	467	13.44	[10.63-16.85]
OBC	1,793	47.26	[43.15-51.39]
Others	1,547	36.94	[33.18-40.88]
MPCE quintile			
Poorest	660	16.23	[13.52-19.37]

Poorer	680	19.03	[15.84-22.70]
Middle	707	18.71	[15.88-21.92]
Richer	861	21.41	[18.50-24.64]
Richest	1,015	24.61	[21.29-28.26]
Community characteristics			
Place of residence			
Rural	1,338	41.88	[38.11-45.75]
Urban	2,585	58.12	[54.25-61.89]
Region			
North	314	07.54	[05.72-09.88]
Central	281	05.29	[03.97-07.03]
East	471	10.42	[08.40-12.84]
Northeast	48	00.28	[00.10-00.82]
West	491	10.14	[08.06-12.67]
South	2,138	65.16	[61.26-68.87]
Union Territories	177	01.17	[00.76-01.80]
Total	**3923**	**100**	
Sources: Based on author's computation from NSSO 71st round, (2014).			
# The total may not be equal due to some missing cases			

Level of care by health facilities

To examine the health seeking behavior of diabetes patients, this study examines the bi-variate differentials by the selected socioeconomic and demographic characteristics. Table 2 shows the percentage distribution of Treatment seeking Behaviors of Diabetes mellitus patients by different health facilities and their selected socioeconomic, demographic and health care related factors, in India. Results indicate that about one forth (23.4%) Diabetes mellitus patients seek treatment from government health care facilities while very large section (76%) of Diabetes mellitus patients seeks treatment from private health care facilities. It can be seen that the highest preference for private health care facilities is amongst younger patients (15-40 years) as compared to older age groups. Furthermore, higher the literacy more is the preference for private facilities. Around 83% of individuals who have secondary education or above seek private facilities while the percentage is around 73% in illiterate individuals. The preference for healthcare facilities is similar in males and females, with male diabetic patients seeking private facilities exceed female patients by a mere 3%. It is interesting to note that the least percentage of diabetic patients seeking private facilities is seen in never married individuals while the currently married patients, probably because of more cautiousness and spending ability, show highest percentage of preference for private facilities as far as marital status is concerned.

When we see religion wise behavior, around 82% of Muslim diabetes patients prefer private facilities followed by Hindu (76.7%) and other religions (70.2%). Amongst different castes, SC and ST diabetes subjects show the least preference for private facilities (62.6 and 62.3% respectively). Also, there is a huge gap in preference of private facilities when we consider the richest (86.1%) and poorest (61.7%) wealth quintiles. Urban areas witness higher preference for private facilities compared to rural areas. Region wise, a strikingly low (23.9%) number of diabetes patients in the north east region of the country prefer private healthcare facilities.

Table 2. Percentage distribution of Treatment seeking Behaviors of Diabetes mellitus patients by selected socioeconomic and demographic, in India, NSSO 2014

	Health facilities			
	Government Facility		***Private facilities***	
	%	**95% C. I**	**%**	**95% C. I**
Individuals characteristics				

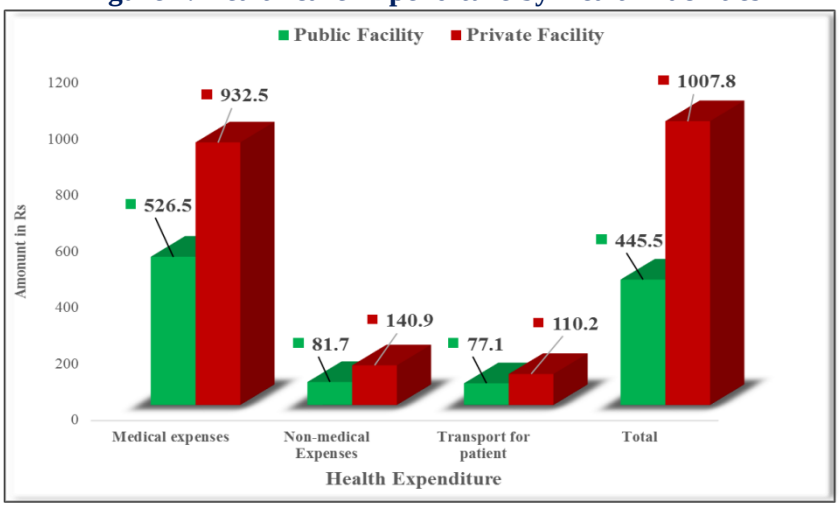
Age (in years)	*χ2= 33.160, P-value=0.019*			
15-40	13.8	[07.9-23.1]	86.2	[76.9-92.1]
41-59	27.0	[22.2-32.3]	73.0	[67.7-77.8]
60 and above	21.4	[17.0-26.5]	78.6	[73.5-83.0]
Education	*χ2= 53.100, P-value=0.018*			
Illiterate	27.1	[20.4-35.1]	72.9	[64.9-79.6]
Up to Primary	27.7	[22.2-33.9]	72.3	[66.1-77.8]
Middle completed	25.5	[18.2-34.6]	74.5	[65.4-81.8]
Secondary and above	16.5	[12.1-22.3]	83.5	[77.7-87.9]
Gender	*χ2= 4.832*	*P-value=0.317*		
Male	22.0	[17.4-27.3]	78.0	[72.7-82.6]
Female	25.0	[20.9-29.6]	75.0	[70.4-79.1]
Marital Status	*χ2= 5.949, P-value=0.544*			
Never married	32.1	[14.5-57.0]	67.9	[43.0-85.5]
Currently married	22.7	[19.0-26.9]	77.3	[73.1-81.0]
Others	25.3	[19.0-32.8]	74.7	[67.2-81.0]
Household characteristics				
Religion	*χ2=16.689*	*P-value=0.380*		
Hindu	23.3	[19.7-27.3]	76.7	[72.7-80.3]
Muslim	18.1	[11.4-27.6]	81.9	[72.4-88.6]
Others	29.8	[16.5-47.7]	70.2	[52.3-83.5]
Caste	*χ2=125.153, P-value=0.000*			
ST	37.7	[18.9-61.1]	62.3	[38.9-81.1]
SC	37.4	[25.8-50.6]	62.6	[49.4-74.2]
OBC	25.6	[20.4-31.5]	74.4	[68.5-79.6]
Others	15.1	[11.2-19.9]	84.9	[80.1-88.8]
MPCE quintile	*χ2=138.690*	*P-value=0.001*		
Poorest	38.3	[28.6-49.2]	61.7	[50.8-71.4]
Poorer	28.1	[19.3-38.9]	71.9	[61.1-80.7]
Middle	20.7	[14.9-28.0]	79.3	[72.0-85.1]
Richer	21.7	[15.3-29.7]	78.3	[70.3-84.7]
Richest	13.9	[09.2-00.3]	86.1	[79.7-90.8]
Community characteristics				
Place of residence	*χ2= 50.433, P-value=0.009*			
Rural	29.1	[22.8-36.4]	70.9	[63.6-77.2]
Urban	19.3	[15.9-23.3]	80.7	[76.7-84.1]
Region	*χ2=95.209, P-value=0.000*			
North	14.9	[08.3-25.4]	85.1	[74.6-91.7]
Central	22.4	[12.2-37.6]	77.6	[62.4-87.8]
East	19.1	[12.5-28.1]	80.9	[71.9-87.5]
Northeast	76.1	[38.3-94.2]	23.9	[05.8-61.7]
West	11.6	[07.0-18.5]	88.4	[81.5-93.0]
South	26.2	[21.5-31.6]	73.8	[68.4-78.5]
Union Territories	52.9	[36.9-68.4]	47.1	[31.6-63.1]
Total	**23.4**	**[20.0-27.3]**	**76.6**	**[72.7-80.0]**
Sources: Based on author's computation from NSSO 71th round, (2014).				

Health care Expenditure by Health Facilities

Figure, 1 presents the average expenditure incurred for treatment of diabetes mellitus as OPD patient of a hospital during the last 15 days preceding the survey. On an average, expenditure per

outpatient care amount to Rs 1007.8 in private facilities while in public set ups it was found to be Rs 445.5. Further analyzing it into more granular level the results exhibited that in private set ups, on an average Rs 932.5 is spent directly on medical expenses, while the non-medical and transport expenses are Rs 140.9 and 110.2, respectively. The medical expenses are much lower in public facilities (Rs 526.5) compared to private ones. Moreover, the expenditure for non-medical expenses is Rs 81.7 and for patient transport is Rs 77.1 in public facilities.

Figure 1. Health care Expenditure by Health Facilities



Socioeconomic Differentials in Health Care Expenditure

Table 3 presents the average treatment expenditure in diabetes patient's different socioeconomic categories. The highest expenditure (Rs 1063.53) was seen in younger patients (15-40 yrs) compared to older patients. With increase in education levels, increased expenditure was observed. As far as gender is concerned, males (961.57) spent more than females (Rs 798.37). In case of marital status, currently married individuals had the highest average expenditure followed by never married individuals, while the other groups spent least. On analyzing average expenditure between religions, highest (Rs 1092.56) was seen in patients belonging to religions other than Hindus and Muslims. Amongst various castes, the scheduled caste people spent least compared to other castes people. The average expense amongst the richest was Rs 1181.42 while amongst the poorest was Rs 680.91. Rural-urban differences in average expenditure were also seen, for urban (Rs 913.47) areas it was higher than rural (Rs 815.04) areas. The central region of the country showed highest mean expenditure (Rs 1573.31) in diabetes individuals while the lowest was seen in the southern region (Rs 706.91).

Table 3. Mean treatment expenditure in diabetes patients by selected socioeconomic and demographic characteristics, India. NSSO 2014

Background Characteristics	Health care expenditure			
	Medical expenses	Non-medical Expenses	Transport for patient	Total
Individuals characteristics				
Age (in years)				
15-40	1001.31	219.69	113.68	1063.53
41-59	858.71	112.33	87.26	869.98
60 and above	836.76	115.33	110.38	859.85
Education				
Illiterate	716.43	96.24	99.48	729.86
Up to Primary	668.58	96.34	77.71	676.47
Middle	810.13	129.96	79.95	841.43
Secondary and above	1122.97	170.69	129.56	1165.74

Gender				
Male	937.06	142.13	107.31	961.57
Female	781.85	103.30	92.47	798.37
Marital Status				
Never married	742.60	173.61	196.12	884.25
Currently married	888.20	122.93	99.27	907.20
Others	758.24	113.20	94.82	775.41
Household characteristics				
Religion				
Hindu	852.58	120.81	91.81	862.25
Muslim	729.82	152.21	136.90	807.94
Others	1069.62	82.69	110.74	1092.56
Caste				
ST	747.38	107.82	166.82	840.81
SC	754.13	118.97	83.34	747.37
OBC	806.94	113.41	92.93	841.76
Others	952.41	137.41	111.04	996.88
MPCE quintile				
Poorest	657.32	104.44	82.06	680.91
Poorer	851.56	131.57	94.86	871.12
Middle	763.95	130.84	75.91	778.13
Richer	730.94	95.61	96.13	759.39
Richest	1141.74	149.50	146.44	1181.42
Community characteristics				
Place of residence				
Rural	790.73	114.73	102.70	815.04
Urban	894.02	127.01	97.88	913.47
Region				
North	880.51	144.49	143.06	957.87
Central	1472.90	368.65	143.16	1573.31
East	879.08	69.74	98.08	920.15
Northeast	1113.56	97.67	108.55	1240.18
West	1081.17	149.50	112.55	1159.81
South	706.54	93.48	79.66	706.91
Union Territories	821.15	180.28	165.72	718.86
Total	**859.57**	**121.82**	**99.87**	**879.86**
Sources: Based on author's computation from NSSO 71th round, (2014).				

Table 4. Proportion of out of pocket expenditure on Diabetes mellitus patient by selected background characteristics

Background Characteristics	Out of pockets expenditure			
	β (Logit)	**Standard Error**	**p-value**	**[95% Conf. Interval]**
Individuals characteristics				
Age (in years)				
15-40				
41-59	-0.038	0.055	0.486	[-0.146-0.070]
60 and above	-0.006	0.057	0.914	[-0.117-0.105]
Education				
Illiterate				
Up to Primary	-0.011	0.030	0.708	[-0.071-0.048]

Middle	-0.017	0.033	0.608	[-0.082-0.048]
Secondary and above	0.055	0.037	0.136	[-0.017-0.126]
Gender				
Male				
Female	0.037	0.029	0.211	[-0.021-0.094]
Marital Status				
Never married				
Currently married	-0.095	0.064	0.135	[-0.220-0.030]
Others	-0.128	0.069	0.064	[-0.264-0.007]
Household characteristics				
Religion				
Hindu				
Muslim	0.051	0.045	0.263	[-0.038-0.140]
Others	0.061	0.045	0.176	[-0.028-0.151]
Caste				
ST				
SC	0.038	0.043	0.369	[-0.045-0.122]
OBC	0.113	0.054	0.038	[0.006-0.220]
Others	0.053	0.040	0.184	[-0.025-0.130]
MPCE quintile				
Poorest				
Poorer	0.107	0.073	0.146	[-0.037-0.250]
Middle	0.064	0.031	0.037	[0.004-0.125]
Richer	0.044	0.033	0.182	[-0.021-0.109]
Richest	0.142	0.045	0.002	[0.054-0.230]
Community characteristics				
Place of residence				
Rural				
Urban	0.001	0.027	0.957	[-0.052-0.055]
Region				
North				
Central	0.179	0.204	0.380	[-0.221-0.579]
East	-0.025	0.059	0.674	[-0.141-0.091]
Northeast	-0.113	0.087	0.196	[-0.284-0.058]
West	-0.004	0.065	0.946	[-0.133-0.124]
South	-0.082	0.056	0.138	[-0.191-0.026]
Union Territories	0.010	0.112	0.926	[-0.210-0.231]
Sources: Based on author's computation from NSSO 71th round, (2014), Schedule 25.0.				

Determinants of out of pocket expenditure

Table 4 shows the result of regression analysis for out of pocket expenditure on diabetes mellitus patients by various background characteristics. It can be seen that there were significant differences in OOPE between different wealth quintiles, the richest spent the most. Further, the OOPE by OBC patients was significantly lower compared to all other castes. Differences were also seen between males and females, the females spending lesser, although not statistically significant. Currently married individuals had higher OOPE than divorced, widows, etc. Higher the education level, greater was the OOPE, although no statistically significant results were obtained here also.

Discussion

Diabetes mellitus is emerging as a catastrophic peril in India. The country shelters the highest number of diabetics in the world with prevalence estimates ranging from 5.6 to 12.4 percent in urban area and 2.4 to 2.7 percent in rural area [12]. This study throws some light on several determinants of

healthcare seeking behavior and healthcare expenditure in diabetes mellitus patients in India. It was seen that a huge proportion of diabetics prefer private healthcare facilities which are definitely heavier on the pocket than public set ups. This can be due to greater comfort and ease with which the patients get treated in the former. Furthermore, the trust factor of the patients and availability of diabetes specialists in the two sectors also needs to be monitored as a contributing factor in these differences. There was a greater preference for private healthcare facilities with increase in wealth as well as education which can be taken as a proxy for awareness and prudence. Even the rural population gives preference to private facilities over public healthcare facilities. In the socially disadvantaged groups (viz. SC, ST, OBC, rural population) this increased visits to private health facilities can further push them towards poverty.

In a recently published study by ICMR, it was found that diabetes is increasingly affecting the lower socio economic groups in India; this epidemiological transition further creates a more worrisome situation as it suggests that the poor might turn poorer because of the need to spend on diabetes treatment [13]. In fact, studies have suggested that poverty and NCDs are linked through several pathways. Simple and affordable measures aimed at primary prevention, early diagnosis and treatment, using inexpensive technologies, pharmacologic and non-pharmacologic means can greatly help [14]. Our study also revealed that the average expenditure was higher in case of younger diabetics, similar findings were obtained in another study where it was seen that the spending on the costlier anti diabetic drugs was higher in children and young adults compared to older population [15]. The higher burden of diabetes observed in Urban, compared to rural, areas has also been seen in other studies and this can be attributed to the "modern", less physically active lifestyle, higher level of stress along with unhealthy food habits in the urban regions [16].

Conclusion and policy Implications

Our study provides an insightful analysis of the attitude of people in seeking health care services for the treatment of diabetes mellitus as well as the health care expenditure for the disease in India. It can be inferred from our findings that the public healthcare facilities need to be strengthened in a way that they attract more diabetes patients so that affordable and timely care can be provided to the masses in a cost effective way. Efforts are needed for the optimization of strategies aimed at diabetes primary and secondary prevention also in order to reduce the OOPE for the people. Educating and spreading awareness among masses along with capacity building of the public healthcare facilities are very essential to break the vicious cycle of poverty and diseases.

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Strengths and Limitations

The strengths of the study arise from the fact that the National Sample Survey Organization (NSSO), Ministry of Statistics, Government of India is a nationally representative and one of the largest surveys conducted from time to time in India. Even so, this study had certain limitations. Firstly, the study couldn't differentiate between the two types of diabetes. The risk factors associated with the types of diabetes might be underestimated. The findings might also be underestimated as individuals of lower age group are likely to suffer from type 1 diabetes. Information on treatment expenditure and different types of dietary habits with physical activity levels was not available.

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