

Do Cataract Surgery Is An Economic Burden In India? Looking Into Different Covariates Associated With Out Of Pocket Expenditure: Findings From National Household Survey, NSSO 75th Round

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Abstract: Objectives: Estimate all types of expenditure related to Cataract surgery in India and To Determine out of Pocket Expenditure and its determinants. **Method:** This is a cross-sectional Quantitative study design, and used the data generated by the 75th Round of National Sample Survey 2017, which measured self-reported morbidity with All kinds of expenditure like Medical expenditure, Non-medical expenditure, Transport, reimbursement and we also calculate out of pocket expenditure (OOPE) to measure financial hardship and its determinants with a sample of 1080 Individuals from all across India. **Results:** The overall hospitalization for cataract surgery in India is 1.1 % and the share of the public facility is only 37%. The mean Medical expenditure for a cataract surgery in India cast 11243 rupees, for transport expenditure 1360 rupees, Total Expenditure is 12749 and the Out of Pocket Expenditure is 9327 Rupees. The factors for Out of pocket Expenditure is Urban spends 3709 more than Rural, Graduate spends 8378 rupees more than Not literate, Private healthcare is 10167 expensive then Public, Richest spent 5326 rupees then Poorest and Non-Insured spend 4830 then Insured. **Conclusion:** Addressing the gaps in Financial Hardships, Improve the Insurance coverage, and Increasing Public sector share for cataract Surgery will improve in decreasing financial burdens.

Keywords: Cataract surgery, economic burden, covariates, Out of pocket Expenditure.

Introduction

Blindness, in the global scenario, is less of a health problem and more importantly a social problem with enormous economic implications that needs to be addressed. A review on the economic burden of blindness globally revealed an alarming total direct cost estimated to be \$ 25 billion every year and this figure would triple when the indirect costs are considered(1,2). It contributes to 33.4% of the burden of all blindness and 18.4% of all MSVI worldwide (3-5). If we will see the preventive strategies, there are no such strategies for cataract treatment which is known to be one of the most cost-effective surgical interventions (4).

In India, 50-80% of the bilateral blindness is due to advanced age, it is the single most important risk factor (6-10). Global agencies and collaborations had promised immense help to execute plans to decrease the burden of blindness due to cataracts. But literature on the actual burden of catastrophic health expenditure on the patients is sparse (5). Despite free cataract surgeries being offered through the National Programme for Control of Blindness (NPCB), hidden factors such as out of pocket

expenditures(OOPEs) may be one of the main barriers to accessing appropriate eye care facilities by our population (11,12).

Socio-economic status is a significant barrier for cataract surgery. For this, it became a barrier for those who are indicated to undergo this type of surgery in developing countries (2). The various risk factors such as poor socioeconomic status, transportation facility, gender, lack of awareness, affordability (12, 13). Several vulnerable groups such as aged cataract affected persons in the developing countries including India may not be financially independent. It has been seen that the effective rate of reducing cataract backlog is not limited to surgery but social things such as education, economical status, occupation of patients, or their guardians or family members (2).

Effective implementation of Universal Health Coverage (UHC), together with equity in access and financial protection can be the only long term solution to the persisting problem (15). There have been large surveys looking at the prevalence and causes of blindness across different states in the country but the need of the hour is a disaggregated data at the district level for OOPE realistic planning and infrastructure development (16). This study aims to address the determinants and risk factors of catastrophic health expenditure from the data of patient's profiles of NSSO 75th round held in 2017 July. We are hopeful that useful insights from this study will help in revising the existing health policies on cataract surgeries and consider effective steps to reduce the economic burden on patients in the future.

Methodology:

This is a cross-sectional Quantitative study design and used the data generated by the 75th Round of National Sample Survey 2017, which measured self-reported morbidity with All kinds of expenditure like Medical expenditure, Non-medical expenditure, Transport, reimbursement and we also calculate out of pocket expenditure (OOPE) to measure financial hardship and its determinants with a sample of 1080 Individuals from all across India. This survey contains socio-economic variables like household and individual characteristics with proportion hospitalization, acute illness, chronic illness, type of provider, expenses (Hospitalized-Non Hospitalized), and Insurance status. This present study used only hospitalization cases with cataract surgery and their expenses (medical and non- medical) Medical expenditure includes doctor's/ surgeon's fee, medications fees, various analysis like blood and radiological tests charges, hospital fees other expenses such as (attendant charges, physiotherapy, personal medical appliances, blood, oxygen, etc.) and in non-medical expenses transport (Rs.) other non-medical expenses experienced by the patient like (registration fee, food, transport) for others, expenditure on the escort, lodging charges, etc. The outcome variable OOPE has been adopted from Wag staff and Doorslaer, in the World Bank document.

Study Variables:

Dependent variable OOPE has been calculated by : Total expenditure (Medical and Non Medical expenditure) minus reimbursement amount. Independent variables are in the study : Place (Rural and Urban, age (Upto 60 Years and Above 60 Years) ,Gender (Male and Female) ,caste (Schedule Tribe, schedule Caste , Other Backward caste and Others) , Education (Not literate ,primary ,middle school, secondary , higher secondary and Graduation), occupation (formal sector jobs, informal sector jobs , self employed and others), marital status (never married, Currently married , Widow and separated) , per capita household expenditure quintile (Poorest, Poor, Middle , Rich and Richest), Insurance (Insurance holder and not Insured) and Indian Regions (North, Northeast, East, Central , west and South)

Results:

Table 1: Socio-economic and demographic characteristics of persons with cataract surgery, India, 2017

Variables

Sector		Occupation of Household	
Rural	62.4 %	Formal Sector Job	18.1 (14.1-23.1)
Urban	37.5 %	Informal sector Job	18.4 (14.2-23.5)
Age		Self-employed	39.7 (33.1-46.8)
Mean age	61.3	Others	23.6 (16.1-33.3)
Median age	60 (60-62)	Marital Status	
Up to 60 Years	46.1 (38.9-53.3)	Never Married	1.7 (0.8-3.2)
Above 60 Years	53.9 (46.7-61.1)	Currently Married	74.1 (68.2-79.2)
Gender		Widow	23.4 (18.4-29.2)
Male	48.3 (40.9-55.8)	Separated	0.7 (0.2-1.8)
Female	51.6 (44.1-59.1)	Per capita Household Expenditure Quintile	
Social Group		Poorest	12.4 (8.1-18.5)
ST	6.6 (3.1-13.3)	Poor	17.1 (13.2-21.7)
SC	18.8 (14.6-23.8)	Middle	23.1 (18.1-28.9)
OBC	38.9 (32.4-45.8)	Rich	22.6 (15.3-32.2)
Others	35.5 (28.1-43.8)	Richest	24.8 (19.9-30.5)
Education		Insurance Status	
Not Literate	45.9 (38.7-53.2)	Insured	19.6 (15.6-24.3)
Primary	28.8 (21.1-38.1)	Not Insured	80.4 (75.6-84.3)
Middle school	8.8 (6.5-11.8)	Region	
Secondary	8.5 (6.1-11.8)	North	13.2 (6.7-24.4)
Higher secondary	3.7 (2.9-5.8)	Northeast	1.5 (0.8-2.7)
Graduation and above	4.1 (2.9-5.6)	East	23.3 (18.4-29.1)
House Hold Size		Central	13.3 (9.7-17.9)
Mean	4.5 (4.4-4.7)	West	16.5 (11.8-22.6)
Median	5 (4-5)	South	32.1 (26.2-38.3)

North: J& K Himachal Pradesh, Punjab, Chandigarh, Haryana, Delhi, Rajasthan; **Northeast:** Sikkim, Arunachal Pradesh,, Nagaland, Manipur, Mizoram, Tripura, Meghalaya, Assam; **East:** Bihar, West Bengal, Jharkhand, Odisha; **Central:** Uttar Pradesh, Chhattisgarh, Madhya Pradesh; **West:** Gujrat, Daman and Diu, Dadar and Nagar Haveli, Maharashtra, Goa; **South:** Andhra Pradesh, Karnataka, Lakshadweep, Kerala, Tamil Nadu, Pondicherry, Andaman and Nicobar, Telangana

employed. 74% married population and 23% .12.4% are from the poorest quintile and 24.8 are from the richest quintile. Only 20% of patients are Insured in the sample profile. The regional distribution of cases is 13 % from North, 1.5% from northeast 23.3% from Central, 16.5% from the west, and 32% from south India.

Table 2: describes all different Types of expenditure a patient can have from all this socio-economic and demographic background. The medical expenditure for cataract Surgery is 11243 in India Rural 8542 and Urban 15594, Male 9174 Female 9746, ST spends 5519 SC spends 7647, and others are 13118, the poorest quintile 36666 and the richest quintile 18406 and Insured 7031 not Insured 10066. The Transport expenditure is 543 rupees and Total expenditure is 12749 (Rural 7587 Urban 15094, Male 10010 Female 10749, ST 2925 sc 6829 Others 13600, Poorest 4326 Richest 19308 and Insured 6948 Not Insured 11234). Reimbursement for cataract surgery is 1360 rupees (Rural 1013 Urban 16113, Male 1396 Female 1096, ST 35 SC 703 Other 1705 Insured 2807 Not Insured 858 and Poorest 78 Richest 3702) and The

out of pocket expenditure for Cataract surgery is 9327 (Rural 6827 Urban 13281, Male 8941 Female 9652, ST 2889 SC 6285 Other 11895 Insured 4947 Not Insured 10376 and Poorest 4247 Richest 16244). These tables give a descriptive idea of the type of expenditure and later Linear regression model has been used for the significance of OOPE.

Table: 2 Descriptive analysis of all Kind of Expenditure during Inpatient:

	Medical Expenditure	Transport Expenditure	Total	Reimbursement	OOPE
Sector					
Rural	8542	377	7587	1013	6827
Urban	15594	431	15094	1613	13281
Age					
Upto 60 years	10252	390	11122	1484	9916
Above 60	8787	403	9798	1028	8825
Gender					
Male	9174	394	10010	1396	8941
Female	9746	400	10749	1096	9652
Social Group					
ST	5519	191	2925	35	2889
SC	7647	433	6829	703	6285
OBC	11584	333	10458	1284	9504
Others	13118	488	13600	1705	11895
Education					
Not Literate	5611	356	6499	449	6049
Primary	8801	318	9493	567	9029
Middle school	14948	642	17192	1984	15208
Secondary	14748	378	13624	4573	10553
Higher secondary	18622	483	22038	3735	18302
Graduation and above	26203	835	28282	4032	24250
Marital Status					
Never Married	27193	483	27623	370	27252
Currently Married	9787	385	10735	1480	9468
Widow	7256	442	8134	576	7558
Separated	6755	177	7640	319	7321
Occupation of Household					
Formal Sector Job	11450	406	12863	2522	10505
Informal sector Job	3775	290	4599	26	4572
Self-employed	10166	418	11078	636	10441
Others	11211	436	11850	2218	10174
Per capita Household Expenditure Quintile					

Poorest	3666	267	4326	78	4247
Poor	7958	404	8880	225	8654
Middle	6814	395	7998	301	7696
Rich	6697	378	7520	903	6616
Richest	18406	477	19308	3702	16244
Insurance Status					
Insured	7031	307	6948	2807	4947
Not Insured	10066	418	11234	858	10376
Region					
North	7918	322	8807	1355	7452
Northeast	6026	636	7155	123	7031
East	7948	413	8789	441	8476
Central	6589	341	7806	530	7276
West	10965	394	12183	860	11322
South	11787	436	12571	2316	10655
Total	11243	12749	1360	543	9327

Table: 3 Linear Regression of Out of Pocket Expenditure:

Linear Regression	Coefficient	Standard error	P Value	[95% Conf. Interval]	
Sector					
Rural	1				
Urban	3709	1013	0	1720	5697
Age					
Up to 60 Years	1				
Above 60 Years	-1453	905	0.11	-3228	323
Gender					
Male	1				
Female	717	909	0.43	-1066	2501
Social Group					
ST	1				
SC	-1508	1959	0.44	-5353	2336
OBC	914	1842	0.62	-2699	4528
Others	1868	1951	0.34	-1959	5696
Education					
Not Literate	1				
Primary	1532	1070	0.15	-567	3631
Middle school	5612	1550	0	2569	8654
High School	-1231	1660	0.46	-4489	2026
11/12 and Diploma	4688	2331	0.05	114	9261
Graduation and above	8378	2251	0.00	3962	12794
Occupation					
Formal Sector Job	1				
Informal sector Job	1194	1445	0.41	-1641	4028

Self-employed	2660	1233	0.03	241	5080
Others	849	1360	0.53	-1820	3517
Type of Provider					
Public	1				
Private	10167	926	0	8351	11984
Duration	400	208	0.05	-7	808
Per capita Household Expenditure Quintile					
Poorest	1				
Poor	1966	1560	0.21	-1096	5028
Middle	1806	1499	0.23	-1136	4748
Rich	-277	1645	0.87	-3504	2950
Richest	5326	1732	0.00	1928	8724
Insurance Status					
Insured	1				
Not Insured	4830	1133	0	2607	7053
Region					
North	1				
Northeast	-2034	3509	0.56	-8919	4852
East	-1197	1521	0.43	-4182	1787
Central	-1294	1743	0.46	-4714	2127
West	1220	1619	0.45	-1958	4397
South	504	1600	0.75	-2635	3644

Linear Regression:

Table 3 shows the determinants of Out of pocket expenditure for cataract surgery in India. Though we have descriptively reported all the determinants but we have used the Linear regression model to see the significance of each factor and Adjusted by Insurance. The urban population tends to spend 3709 more than Rural. We found when the level of education improves the expenditure also increases, people who have studied up to middle school are spending 5612 then Not literate, People studied up to 11/12th are spending 4688 then Not literate and a graduate spend 8378 then Not literate. Formal sector Employees are spending 2660 rupees more than Self employed. Private sectors are charging 10167 rupees more than the Public sector. We found duration have not any impact on expenditure in Cataract surgery but when the socio-economic status improves the paying capacity is increasing like: People from Richest quintile are spending 5326 rupees more than the poorest quintile. One of our major findings is that Insurance has a signify factor to reduced OOPE with 4830 rupees. There is no such difference we found in the different parts of India.

Discussion:

The health rounds of the National Sample Survey are one of the Surveys available in India to study the cost of care and morbidity pattern of diseases. The proportion of people who have hospitalized for cataract surgery is 1.4% and global trends are also similar (17). Reported morbidity is higher in rural (62%) as compared to Urban as like other studies. The proportion of patients with cataract surgery who received care with public healthcare providers was only 40%. This study concluded that important reasons for this could be the lack of appropriate public services at primary health care levels. This study shows that hospitalization from Urban, Socially high offs and Not-Insured are going through financial hardship as measured by the Linear regression Model (18-23).

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