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ORIGINAL ARTICLE

Out-of-Pocket Expenditure in Patients admitted to Cardiology Department under AB-PMJAY scheme in a Tertiary Care Hospital in Delhi: A Cross-Sectional Study

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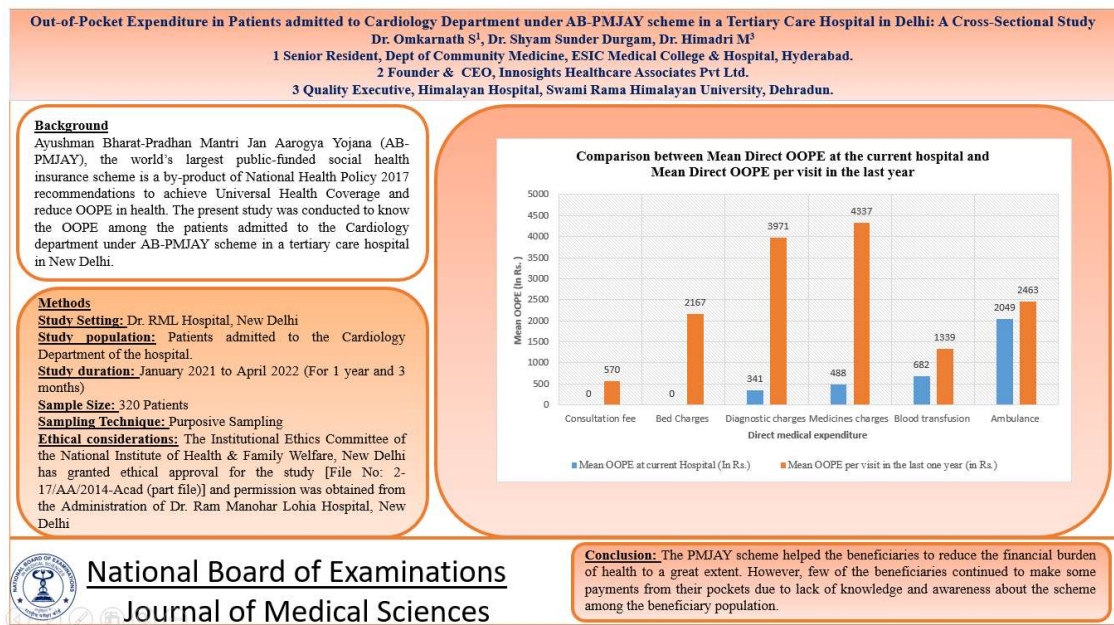
Abstract

Introduction: The recent National Health Accounts 2019-20 data reveals that Out-of-Pocket Expenditure (OOPE) as a percent of Total Health Expenditure is more than 47% which is still higher compared to out-of-pocket health spending in other developing nations. Ayushman Bharat-Pradhan Mantri Jan Aarogya Yojana (AB-PMJAY), the world's largest public-funded social health insurance scheme is a by-product of National Health Policy 2017 recommendations to achieve Universal Health Coverage and reduce OOPE in health. The present study was conducted to know the OOPE among the patients admitted to the Cardiology department under AB-PMJAY scheme in a tertiary care hospital in New Delhi. **Methods:** A descriptive cross-sectional study was carried out from January 2021 to April 2022 among the patients admitted under the PMJAY scheme in the Cardiology Department of Tertiary Care Hospital in New Delhi. A total of 320 patients were interviewed using a structured questionnaire divided into eight sections. The collected data was tabulated in Microsoft Excel and analyzed. **Results:** The study investigated out-of-pocket expenditure (OOPE) for patients, finding the scheme covered doctor consultations, bed charges, physiotherapy, implants, and oxygen, but some patients still faced OOPE for diagnostics (15%), medicines (22.5%), blood transfusions (8.75%), and ambulance with an average direct medical expenditure of approximately Rs. 1511 during the hospital stay at the current hospital. Compared to previous hospitalizations, OOPE for diagnostics, medicines, and blood transfusions significantly decreased under PMJAY. Overall, 60.3% of respondents were satisfied with the PMJAY scheme. **Conclusion:** The PMJAY scheme helped the beneficiaries to reduce the financial burden of health to a great extent. However, few of the beneficiaries continued to make some payments from their pockets for diagnosis, medication, etc. The main reason for this was a lack of knowledge and awareness about the scheme among the beneficiary population.

Keywords: AB-PMJAY Scheme, Out of Pocket Expenditure (OOPE), Cardiology Patients, Public Funded Health Insurance, Universal Health Coverage (UHC)

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Graphical Abstract



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Introduction

The major policy goal in the health sector globally is to achieve Universal Health Coverage (UHC) [1]. The definition of UHC given by the WHO is to provide all people with access to needed health services (Prevention, Promotion, Treatment & Palliation) of sufficient quality to be efficient and ensure that the use of these services doesn't expose the user to financial hardships [2]. Ideally, health care costs should not be paid Out of Pocket (OOP) by users at the time of seeking services but through prepayment mechanisms or tax revenues. Contrary to this, about 60 million Indians fall into poverty annually due to the expenditure on health. Despite the acceptance of UHC at the policy level in India, over 50% of healthcare spending is borne by households in India [3]. The recent National Sample Survey (NSS-75th round) report reveals that only 19.1% of the urban and 14.1% of the rural population is under any health protection coverage [4].

Ayushman Bharat PM-JAY is the largest health assurance scheme in the world which aims at providing a health cover of Rs. 5 lakhs per family per year for secondary and tertiary care hospitalization to over 10.74 crores of poor and vulnerable families (approximately 50 crore beneficiaries) that form the bottom 40% of the Indian population. Except for West Bengal, Odisha, and Delhi, the program is currently being implemented throughout all of India's states and union territories. It aims to provide cashless and paperless health cover up to 5 lacs per family per annum with no cap on family size including 3 days' pre-hospitalization and 15 days' post-hospitalization expenses which covers 1950 procedures and is portable across the country [5]. At the moment, PM-JAY offers 56 cardiac therapy packages with 156 procedures from the cardiology and cardiothoracic and vascular surgery (CTVS) specialties. The study aims to assess the 'Out of Pocket Expenditure' incurred among the Cardiology patients

admitted under PMJAY in a tertiary care hospital in Delhi. The objectives are to assess the direct and indirect health expenditures incurred by the patients admitted in the cardiology department under PMJAY in a tertiary care hospital in Delhi and to compare the expenditure incurred by the patients before PMJAY and after their preauthorization into the scheme.

Methodology and Methods

Study Settings & Design

A Hospital-Based Descriptive Cross-Sectional Study was conducted from January 2021 to April 2022 (For 1 year and 3 months). A purposive method of sampling was applied to select the study area. High inpatient admissions under the PMJAY scheme and the willingness of the hospital authorities to give permission are considered key factors in selecting the study area. The study was undertaken in Dr. Ram Manohar Lohia Hospital, New Delhi after obtaining permission from the concerned hospital authorities.

Study Population

For this hospital-based study, the population comprised of patients who were admitted to the Department of Cardiology to seek treatment under the PMJAY scheme during the study period were interviewed and the relevant information was sought from beneficiaries. The study included patients admitted directly to the Department of Cardiology and those referred from other departments under the PMJAY scheme during the study period whereas severely ill patients, those seeking non-PMJAY treatment packages, ineligible or uncovered patients, and those unwilling to participate were excluded from the study.

Sample size

The sample size was calculated, according to NSSO 75th round [4], OOPE in health is about 66%. Assuming it to be 70%, ($p = 0.70$) and taking a 95% confidence level with $\pm 5\%$ precision, Using the formula, $n = z^2 pq/d^2$ where, n = number of participants, Z = Standard normal variant at the confidence level of 95% (Normal value is 1.96) p = prevalence = 0.70 $q = 1-p = 0.30$, absolute precision (d) = 0.05, Thus, bringing the sample size to 320. Considering the proposed sample size and the average number of In-Patient admissions in the cardiology department in the hospital from the records, all the patients admitted to the department of cardiology during the study period were included in the study to meet the proposed sample size.

Data Collection tool & technique

Data was collected from the patients in the inpatient area, they were approached about their willingness to participate in the current study, and informed consent was obtained, after providing them with a detailed participant information sheet. The data was collected using a pretested, semi-structured interview schedule developed after a thorough literature review and consultation with various stakeholders. Details sought are included in eight sections i.e., Socio-demographic profile of the study population, Patient, Household characteristics, Awareness of the PMJAY scheme, Utilization of the PMJAY scheme, Details of current hospitalization, The total expenditure incurred to avail the treatment of the diagnosed health issue till the admission to the current hospital, OOPE for the last one year for treating the particular illness, Mean OOPE per visit in the last year compared to the OOPE at the current health

facility and the Patient satisfaction with the scheme. The questionnaire was pre-tested as a part of a pilot study before administering the same to the study population. The source of finances to meet the expenses was also recorded. The satisfaction of the patients regarding the scheme was also obtained in a graded manner using a Likert scale. Any queries were promptly addressed during the entire duration of the interview. After the interview was over, the participants were thanked for their valuable time and support in the study.

Data Analysis

All case forms were given a unique Case ID and raw data were tabulated in a Microsoft Excel sheet (MS Office 2019). All entered cases were rechecked for correctness and any typographical errors were removed. Any missing information noticed at this juncture was filled out after contacting the participant on a phone call. The personal information was de-linked before doing data analysis. The collected data were tabulated in an Excel sheet (MS Office 2019) and were analyzed using Descriptive statistics such as frequency and percentage to analyze the socio-

demographic profile of the subjects. Average OOP expenditure (mean and median) incurred for the period of hospitalization due to illness and up to 1 year before hospitalization for the same diseases was calculated and represented as tables, graphs, and figures.

Results

Socio-demographic Characteristics of Participants

A total of 320 patients admitted to the cardiology department under PMJAY were interviewed for this study. Out of 320 respondents, 63 % of the beneficiaries were male (n=202) and 37% of the beneficiaries were female (n=118). The majority of participants, 33.1% belonged to the age group of 45 to 59 years (n=106) followed by 26.3% of beneficiaries belonging to the age group of 30 to 44 years (n=84), 21.2% of beneficiaries belonging to the age group >60 years (n=68), 12.2% of beneficiaries were belonging to the age group of 15 to 29 years (n=39) and 7.1% of the beneficiaries belonging to the age group <14years (n=23). 77.5% of the beneficiaries were married (n=248), 13.4% were never married and 9.1% of them were married by widowed or divorced (Table 1).

Table 1. Socio-demographic Characteristics of Participants

Characteristics		Frequency (n)	Percentage
Age	>60	68	21.20%
	45-59	106	33.10%
	30-44	84	26.30%
	15-29	39	12.20%
	<14	23	7.10%

Gender	Male	202	63%
	Female	118	37%
Marital Status	Married	248	77.5%
	Never Married	43	13.4%
	Widowed/Divorced	29	9.1%
History of Chronic Illnesses	Known Chronic illnesses present	233	72.8%
	No History of chronic illness in the recent past	38	11.9%
	Status not known	49	15.3%
	Total	320	100%

The state-wise distribution of beneficiaries was 43.5% of beneficiaries belonging to Bihar state (n=139) followed by 38.4% of beneficiaries belonging to Uttar Pradesh state (n=123), 5.3% of the beneficiaries belonging to Haryana state (n=17), 4.1% of the beneficiaries belong to Uttarakhand state (n=13), 2.2% of the beneficiaries belong to Madhya Pradesh state (n=7), 6.5% of the beneficiaries belong to Punjab state (n=21). Most of the beneficiaries i.e., about 68.4% are from rural areas (n=219) and 31.6% are from

urban areas (n=101). Out of 72.8% of the beneficiaries (n=233) who are suffering from chronic illnesses, 30.3% of the beneficiaries are suffering from only Hypertension (n=97), 19.3% of them are suffering from only Diabetes Mellitus (n=62), 15.9% of them are suffering from both Hypertension and Diabetes Mellitus, and 7.1% of the beneficiaries are suffering from Thyroid related diseases (Both Hypothyroidism and Hyperthyroidism) (Table 2).

Table 2: Educational Status & Occupation of Participants

Characteristics		Frequency (n)		Total	Percentage (%)
		Male	Female		
Education	Illiterate	13	22	35	11%
	Literate	44	17	61	19%
	Primary	62	35	97	30.3%
	Junior High School	24	18	42	13.1%
	High School	19	12	31	9.7%
	Intermediate	14	09	25	7.8%
	Graduate	16	05	21	6.6%
	Postgraduate & above	08	00	08	2.5%

Occupation	Unemployed	61	6	67	20.9%
	Student	21	8	29	9.1%
	Housewife	0	51	51	15.9%
	Daily labourer	54	23	77	24.1%
	Farmer	35	19	54	16.9%
	Skilled worker	19	7	26	8.1%
	Self-employed	12	4	16	5%
	Total	202	118	320	100%

The majority of the study population about 30.3% have completed their primary education (n=97). Of them, 62 were males and 35 were females. 11% of the respondents, 13 males, and 22 females were illiterate among the study population. 24.1% of the beneficiaries are daily laborers (n=77). Of them, 54 were males

and 23 were females. 16.9% of them are farmers (n=54), 8.1% of them are skilled workers (n=26), 9.1% of them are students (n=29), 15.9% are house-wives (n=51), 5% are self-employed (n=16), and 20.9% of the beneficiaries are unemployed (n=67). (Table 3).

Table 3. Average Family Size of the study population

No. of members in the family	Frequency (n)		Total	Percentage (%)
	Rural	Urban		
Only Single member	4	7	11	3.4%
2	13	5	18	5.6%
3	23	8	31	9.7%
4	91	37	128	40%
5	77	32	109	34.1%
≥6	11	12	23	7.2%
Total	219	101	320	100%

Household Characteristics of the Study Population

It was found that comparatively, the family size in the rural areas is slightly higher than the family size in the urban areas. 39.7% of the respondents are living in the Pucca house (n=127), 17.2% in the semi-pucca house (n=55), 23.1% are living in the serviceable Kutcha house and 20% of them are living in the unserviceable Kutcha house. 74.1% of the beneficiaries are living in their own house (n=237) whereas 25.9% of them are living in a rented house (n=83). It was found that 52.5% of the family had a monthly income of less than Rs. 5,000 (n=168). 34.1% had it between Rs. 5,000-10,000. While 13.4% were those who had a monthly income of more than Rs. 10,000. The monthly per capita income of 41.5% of the family was less than Rs. 1,000. And 37.8% had it between Rs. 1,000-1,500. 11.6% of the beneficiaries had a monthly per capita income of between Rs. 1501-2000, and 3.7% of them had a monthly per capita income between Rs. 2001-2500. While only 5.4% were those who had a monthly per capita of more than Rs. 2,500.

Details of Hospitalization and Health Expenditure to Treat the Particular Illness at the Current Hospital

The majority of patients were diagnosed with Percutaneous Transluminal Coronary Angioplasty with a diagnostic angiogram (n=132), followed by Percutaneous Transluminal Coronary Angioplasty with Double Medicated Stent and diagnostic angiogram (n=56), and Percutaneous Transluminal Coronary Angioplasty with Single Medicated Stent and diagnostic angiogram (n=43). Other diagnoses included Permanent Pacemaker (VVI) implantation (n=31), Permanent Pacemaker implantation - single chamber (n=19), Patent Ductus Arteriosus device closure (n=18), Percutaneous Transluminal Coronary Angioplasty with additional stent (n=7), Atrial Septal Defect device closure (n=5), Temporary Pacemaker implantation (n=4), Permanent Pacemaker (DDR) implantation - double chamber (n=2), Peripheral angiography with medicated stent (n=1), and Unspecified package (n=2) (Figure 1 and Table 4).

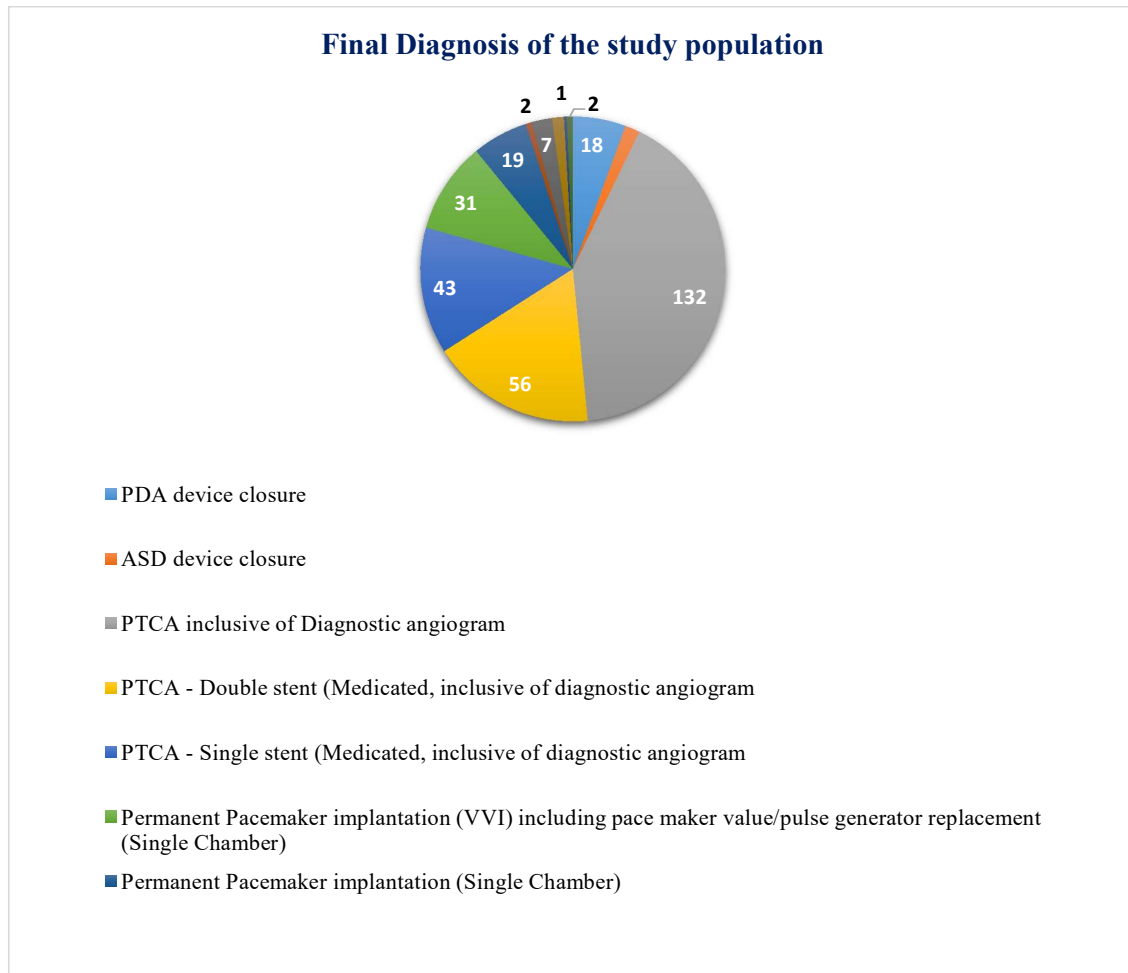


Figure 1. Diagnosis of the patients admitted under the scheme

Table 4. Direct Out-of-Pocket Expenditure by the Patient for availing the treatment

Characteristics		Frequency (n)	Percentage
Duration of hospitalization	Only 1 day	83	26%
	2 days only	117	37%
	3-5 days	71	22%
	6-7 days	32	10%
	>7 days	17	5%
Amount spent on Diagnostic charges	Did not pay any amount	273	85%
	<2000	28	9%
	2001-5000	8	2%
	>5000	7	2%
	Did not pay any amount	247	77.5%

Amount spent to purchase Medicines	<2000	61	19%
	2001-3000	7	2%
	>3000	5	1.5%
Amount spent on Blood Transfusion charges	Blood Transfusion not indicated	293	91.5%
	Did not pay any amount	18	6%
	<2000	5	1.5%
	2001-3000	4	1%
Amount spent on patient transfer by ambulance	Have not utilized Ambulance service	237	79.5%
	Did not pay any amount	21	6.5%
	<2000	15	5%
	2001-3000	33	10%
	>3000	14	4%

The majority of patients (37%) stayed in the hospital for 2 days, 26% for 1 day, 22% for 3-5 days, 10% for 6-7 days, and 5% for more than 7 days. Among the 320 respondents, none paid for doctor consultations or bed charges during their hospital stay. Most patients (85%) did not pay for diagnostic services, but 47 patients (15%) incurred diagnostic test charges. Approximately 22.5% (73 patients) paid for medicines, with 19% (n=61) spending less than Rs. 2000, due to non-availability in the hospital pharmacy, often during emergencies. Of the 27 patients who underwent blood transfusions, 18 did not

pay, 5 paid less than Rs. 2000, and 4 paid between Rs. 2000 and Rs. 3000 due to specific blood types being unavailable in the blood bank. Out of 320 patients, 53 required physiotherapy, 188 needed implants or prosthetic devices, and 39 required oxygen support. None of these patients had to pay for these services. Additionally, 83 patients (20.5%) used ambulance services. Of these, 21 used public emergency services without cost, 15 paid less than Rs. 2000, 33 paid between Rs. 2001 and Rs. 3000, and 14 paid more than Rs. 3000 (Table 5).

Table 5. Indirect Out-of-Pocket Expenditure by the Patient for availing the treatment

Characteristics	Amount Paid (In Rs.)	For patient		For attendant(s)	
		Frequency (n)	Percentage	Frequency (n)	Percentage
Amount spent on Food during the hospital stay	Did not pay any amount	142	44.4%	0	0
	<1000	137	42.8%	252	78.8%
	1001-2000	41	12.8%	31	9.7%
Amount spent on accommodation for seeking treatment	Did not pay any amount	289	90.3%	242	75.6%
	<1000	27	8.4%	36	11.2%
	1001-2000	4	1.3%	5	1.6%
Amount spent on transport for seeking treatment	<1000	113	35.3%	104	32.5%
	1001-2000	129	40.3%	137	42.8%
	2001-3000	78	24.4%	42	13.1%
Daily wage loss during treatment	No wage loss	125	39.1%	157	49.1%
	<300	103	32.2%	71	22.1%
	301-500	77	24%	55	17.2%
	>500	15	4.7%	0	0
Total		320	100%	283	88.4%

Food for patients was free during the hospital stay, but some had to spend on specific diets like fruits and nutrient-rich food. Food for attendants was not provided, with 78.8% (n=252) spending less than Rs. 1000, and 9.7% (n=31) spending between Rs. 1000 and Rs. 2000. About 9.7% of patients (n=31) incurred accommodation costs. Most attendants (75.6%, n=242) did not spend on accommodation, while 11.2% (n=36) spent less than Rs. 1000, and 1.6% (n=5) spent between Rs. 1001 and Rs. 2000. This was mainly due to waiting times for pre-authorization and subsequent appointments. Regarding travel expenses, 35.3% of patients (n=113) spent less than Rs. 1000, 40.3% (n=129) spent between Rs. 1001 and Rs. 2000, and 24.4% (n=78) spent between Rs. 2001 and Rs. 3000. Among attendants, 32.5% (n=104) spent less than Rs. 1000, 42.8% (n=137) spent between Rs. 1001 and Rs. 2000, and 13.1% (n=42) spent

between Rs. 2001 and Rs. 3000. Regarding wage loss, 39.1% of patients (n=125) and 49.1% of attendants (n=157) experienced no wage loss as they were students, housewives, or unemployed. Of those who experienced wage loss, 32.2% of patients (n=71) and 22.1% of attendants (n=71) lost Rs. 300 per day, 24% of patients (n=77) and 17.2% of attendants (n=55) lost between Rs. 301 and Rs. 500 per day. Around 4.7% of patients (n=15) lost over Rs. 500 per day, while no attendants lost more than Rs. 500 per day.

Majority of the patients (n=134) borrowed some money from their friends or relatives, 87 patients spent amount from their wages/salaries, 73 patients utilized their savings while 19 of them had to mortgage some property and 7 of them had to sell their property to meet the expenses at the hospital (Figure 2).

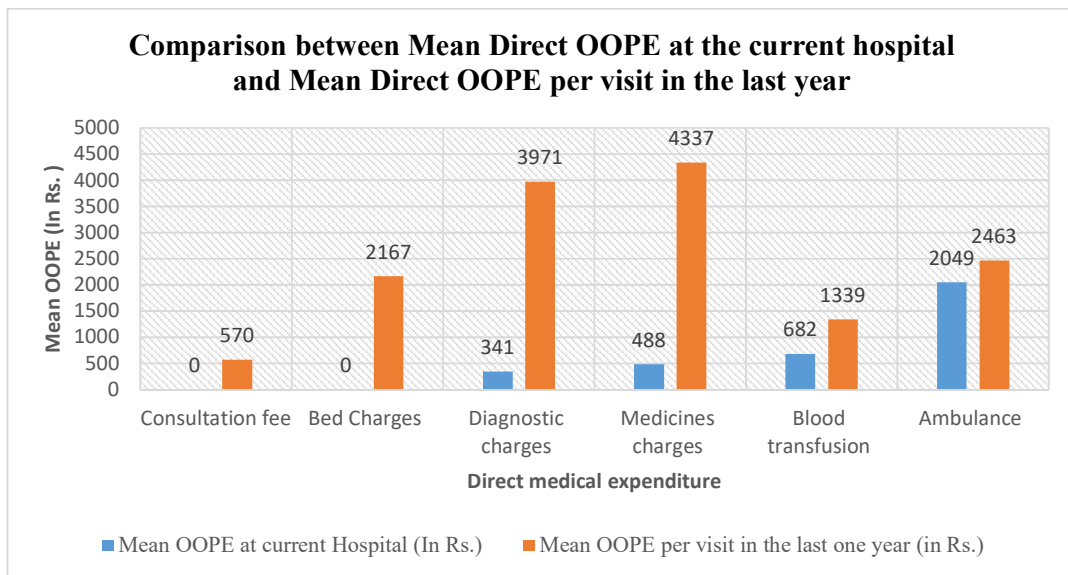


Figure 2. Comparison between Mean Direct OOPE at the current hospital and Mean Direct OOPE per visit in the last year

Comparison of Mean OOPE Per Visit in the Last Year with OOPE at the Current Health Facility

During the study, it was found that none of the respondents had any OOPE on consultation fees and bed charges in the current health facility. It was seen that the mean OOPE at the current hospital on

diagnostic charges and medicines charges is drastically decreased by approximately ten-fold and almost halved in the case of blood transfusion when compared with the Mean OOPE per visit in the last year. It was observed that there is no significant change in the OOPE spent on ambulance services. (Figure 3)

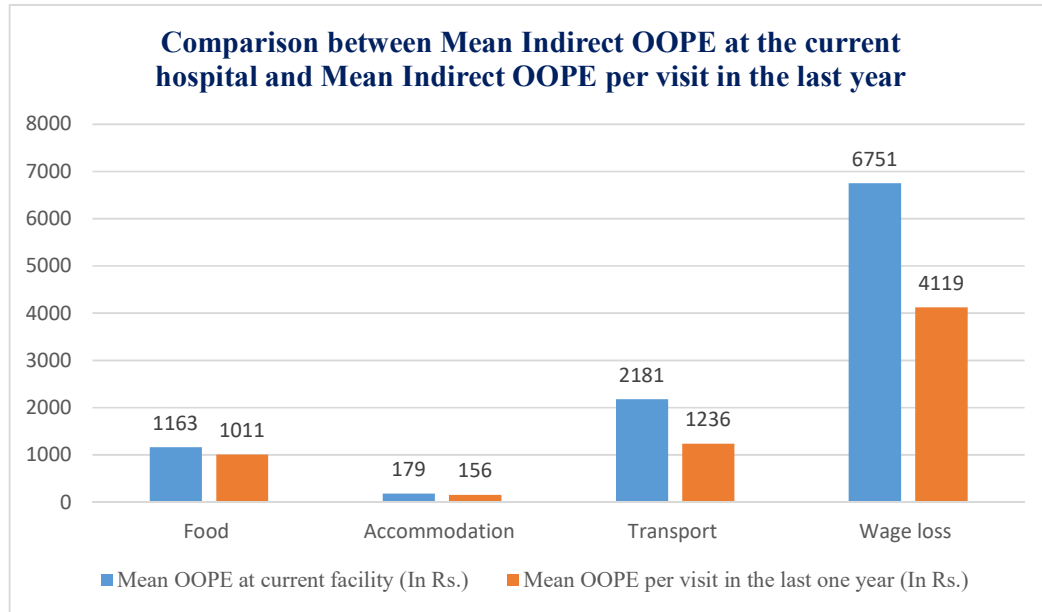


Figure 3. Comparison between Mean Indirect OOPE at the current hospital and Mean Indirect OOPE per visit in the last year

The study revealed that there is no significant change in the indirect OOPE when the Mean Indirect OOPE at the current hospital and Mean OOPE per visit in one year is compared. On the contrary, it was seen that there is a slight increase in the mean OOPE at the current hospital on food, accommodation, transport, and also wage loss. The reason for the increase in indirect health expenditure in the current hospital may be because the majority of the respondents were from surrounding states and they had to travel a long distance, arrange for food and accommodation in Delhi, and also had a greater number of days of wage loss.

Patient Satisfaction with the Scheme

Among all participants, 60.3% were very satisfied with the treatment and benefits provided under the scheme, while 25.3% (n=81) were satisfied. Less than 1% (n=2) were very unsatisfied, and around 10% (n=31) had a neutral opinion on the scheme's functioning and services.

Discussion

The results of this study were consistent with a study conducted by Dash et al. (2020) in three states (Bihar, Haryana, and Tamil Nadu) that showed that 71% of the beneficiaries were aware that all the members of the family were eligible to

avail benefits of the PMJAY scheme in the state of Haryana. The study also found that 95% (n = 111) of the beneficiaries were aware that a maximum coverage of 5,00,000 rupees per family per year was being provided under the scheme. The current study found that 77% of the respondents were aware of the maximum amount of coverage under the PMJAY, i.e., annual coverage of up to Rs. 5,00,000 per family [6]. A similar study conducted in the Thanjavur district of Tamil Nadu state by Pugazhenthii (2021) that emphasized mainly awareness of cancer care among the beneficiaries under PMJAY found that the level of awareness among beneficiaries about the amount covered under PMJAY was 42% [7]. In this study, the majority of patients were treated for Percutaneous Transluminal Coronary Angioplasty with diagnostic angiogram (n=132), followed by Double Stent PTCA (n=56), Single Stent PTCA (n=43), and other procedures. These findings align with Pulkit et al.'s study, which highlighted that PTCA with a single stent was the most utilized cardiac package, followed by double-stent PTCA. The top five cardiac packages in their study accounted for over 70% of total cardiac claims under PMJAY [8]. The study found that respondents had no out-of-pocket expenses for consultation fees or bed charges at the current health facility. The mean out-of-pocket expenditure (OOPE) for diagnostic and medicine charges decreased significantly—by about ten-fold—compared to the previous year, and blood transfusion costs were almost halved. This suggests that without the PMJAY scheme, more households might face financial hardship or forgo treatment. However, there was no significant reduction in out-of-pocket costs for ambulance services, which averaged Rs.

2049. This remains a concern since the scheme is supposed to be cashless, with many patients resorting to private ambulances due to a lack of free government services. During the study, it was found that about 22.5% of the beneficiaries (n=73) paid some amount to buy medicines. Ideally, all medicines have to be provided free of cost under the PMJAY scheme. But there are certain instances where the beneficiaries were asked to buy some medicines from outside. The main reason for this is the non-availability of the medicines in the pharmacy attached to the hospital (AMRIT Pharmacy). In some cases, the patients were already on some medication and they preferred to take those medicines from private pharmacies as the drugs given in the hospital are of different brands.

Conclusion

Despite the majority of patients benefiting from cost-free consultations and bed charges, some incurred expenses for diagnostics, medicines, and specific treatments due to service availability issues. The socio-demographic profile revealed that middle-aged males from lower-income rural areas were the majority of users. Although there were gaps in knowledge regarding empaneled hospitals and service providers, awareness of PMJAY's coverage was generally strong. The scheme's effect on financial burdens was demonstrated by the study's comparison of OOPE over time, which revealed a significant decrease in direct expenses at the current hospital, such as diagnostics and medications. To optimize the scheme's benefits, it is essential to address knowledge gaps and provide equal opportunities for rural and lower-income communities. Maintaining PMJAY's aim to provide universal access to

high-quality, reasonably priced healthcare requires continuous improvements and dedicated support systems.

Ethical Considerations

The Institutional Ethics Committee has granted ethical approval for the study [File No: 2-17/AA/2014-Acad (part file)] and permission was obtained from the Administration of Dr. Ram Manohar Lohia Hospital, New Delhi for collecting the data from the patients admitted to the Cardiology Department of the hospital.

Conflicts of interest

The authors declares that they do not have conflict of interest.

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