

Coronary Heart Disease Patients Under the Chief Minister's Comprehensive Health Insurance Scheme: A Study in Tamil Nadu

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Abstract: Coronary Heart Disease (CHD) remains a major public health challenge in India and ensuring equitable access to quality healthcare is essential for reducing its health and economic burden. The Chief Minister's Comprehensive Health Insurance Scheme (CMCHIS) in Tamil Nadu provides financial risk protection to economically disadvantaged and vulnerable households by covering expensive like cardiac procedures such as angioplasty and Coronary Artery Bypass Graft (CABG) surgery, thereby contributing to Universal Health Coverage (UHC). This study examined patient experiences, satisfaction levels and barriers encountered while accessing CHD-related healthcare services under the CMCHIS. A cross-sectional study was conducted using telephone surveys among 95 CMCHIS beneficiaries with CHD, selected from a sampling frame of 1,600 CMCHIS beneficiary CHD patients obtained from five hospitals. The sample size was calculated using Fisher's formula for a finite population with a 10% margin of error. Data were collected on participants' awareness of the scheme, enrollment process, quality of healthcare services, out-of-pocket expenditure and overall satisfaction. Descriptive statistics, including frequencies, percentages, proportions and means, were used to summarize the data, while an independent samples t-test was performed to compare group means. Statistical analyses were conducted using IBM SPSS Statistics version 23.0. The findings revealed that CMCHIS substantially reduced the financial burden of CHD treatment for most beneficiaries, thereby promoting health equity and improving healthcare accessibility. However, 6.3% of respondents reported incurring out-of-pocket expenses for medicines, diagnostic tests or post-operative care. Overall satisfaction with the scheme was high (77.9%), particularly regarding the quality of treatment received. Nevertheless, challenges remained in terms of waiting time, clarity of information and administrative procedures. Strengthening beneficiary awareness, streamlining administrative processes and integrating digital follow-up systems could further enhance quality health services, improve continuity of care and contribute to health system strengthening, supporting the achievement of Sustainable Development Goal 3 (Good Health and Well-being) through inclusive healthcare and Universal Health Coverage.

Key Words: Chief Minister Comprehensive Health Insurance Scheme, Coronary Heart Disease Patients, Patient Satisfaction, Mortality rate, Sustainable Development Goals, Universal Health Coverage, World Health Organisation and Poor

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INTRODUCTION

According to the WHO [1], Non-Communicable Diseases (NCDs) report for 2023, 74% of global deaths each year are attributed to NCDs, amounting to 44 million people. Of these, 77% occur in low- and middle-income countries. Cardiovascular diseases account for the largest proportion of NCD-related deaths globally, with 17.9 million deaths, equivalent to 32% of the total [2]. Among these, 85% are due to heart attacks and strokes, with Coronary Heart Disease (CHD)/Coronary Artery Disease (CAD) being the primary causes [3].

According to the World Bank report, India falls under the Lower-Middle-Income Countries category. In India, 63% of mortality is due to NCDs, with Cardiovascular Diseases (CVD) being the leading cause, accounting for 27% of deaths [4]. The National Crime Records Bureau (NCRB) report in 2022 noted a 12.5% increase in CHD mortality in India [5].

In Tamil Nadu, 75% of mortality rate is attributed to NCDs, with 36% of these deaths caused by CHD [6]. This data clearly shows that CHD-related mortality in Tamil Nadu is higher than the national average. Additionally, healthcare services for CHD, such as angioplasty and bypass surgeries, are costly and need to be administered promptly. For the poor, accessing these services is even more burdensome, leading to many CHD-related deaths due to Catastrophic Health Expenditure (CHE). CHE is defined as health expenditure that exceeds 10% of a household's total expenditure.



Beyond financial accessibility, patient trust plays a significant role in determining healthcare utilization, treatment adherence and satisfaction with healthcare services. Studies on healthcare branding suggest that institutional identity and patient-centered communication strategies, including the use of fluid trademarks, can positively influence patients' psychological trust and foster long-term confidence and loyalty toward healthcare providers. Such trust is particularly relevant in publicly funded health insurance schemes, where beneficiaries' perceptions of healthcare institutions can shape their overall experience and willingness to utilize available services [7].

To address this issue in Tamil Nadu, the Kalaigarn Kappittu Thittam was introduced in 2009, later renamed the Chief Minister's Comprehensive Health Insurance Scheme (CMCHIS) in 2011 under the leadership of J. Jayalalithaa [8]. In 2018, it was integrated into the Ayushman Bharat Pradhan Mantri Jan Arogya Yojana Scheme (National Scheme) for Universal Health Coverage. The main objective of the scheme is to provide lifesaving treatment with world-class services free of cost for the poor [9].

Under this scheme, beneficiaries (individuals/families) below the poverty line, with a family income of less than INR 1,20,000 per annum, are eligible for up to INR 5,00,000 worth of treatment services in both government and scheme-empanelled private hospitals in Tamil Nadu [8,9]. The scheme covers a total of 1,090 procedures, including 8 continuous procedures and 52 diagnostic procedures [9]. It also covers CHD-related services, such as angioplasty and bypass surgery.

To enroll in this scheme, the beneficiary and family should be Tamil Nadu residence then the head of the family must fill the information in the application form for the Chief Minister's Comprehensive Health Insurance Scheme and submit the following documents to the kiosk operator: the original and a photocopy of the ration card listing the family members' names, the Aadhaar cards of all family members, an income certificate from the VAO/revenue authorities of the resident's location and a self-declaration from the head of the family [10]. After verification, a smart card will be issued, allowing access to these services free of charge. According to the official 2022 report, nearly 1.37 crore families have utilized this service [8]. However, previous studies have shown that even when healthcare services are available under government-supported programmes, beneficiaries may continue to experience barriers related to awareness, accessibility, utilization and unmet healthcare needs, thereby affecting the effective use of healthcare services [11]. Although CMCHIS has been implemented to reduce financial barriers to cardiac care, limited research has examined whether CHD beneficiaries are satisfied with the scheme, the barriers they continue to face and the extent to which the scheme protects them from out-of-pocket expenditure.

Statement of the Problem

Although this scheme provides numerous health services to the poor, offering coverage of up to ₹500,000 for individuals or families, this study focuses specifically on CHD (coronary heart disease) patients who underwent angioplasty and bypass surgeries through the CMCHIS. The reason for this focus is that CHD-related mortality in India, particularly in Tamil Nadu, is higher compared to other diseases. Additionally, many CHD-related deaths go untreated due to the high cost of these treatments, which is often unaffordable for the poor. Therefore, it is important to assess the satisfaction of beneficiaries regarding their treatment, as well as the challenges they face in accessing life-saving services like angioplasty and bypass surgeries under the CMCHIS.

Based on the above discussion the following objectives was framed

- To examine the socio-economic conditions of the patients.
- To assess the challenges faced in accessing the services.
- To evaluate patient satisfaction with the quality of treatment and surgeries

METHODS

A cross-sectional survey [12] was conducted in five selected hospitals in Chennai, Tamil Nadu, comprising three government hospitals and two private hospitals. A list of 1,600 Tamil Nadu Chief Minister's Comprehensive Health Insurance Scheme (TNCMCHIS) beneficiaries, along with their contact numbers, who had undergone cardiac surgery between 1 January 2024 and 30 April 2024, was obtained from the selected hospitals. The sample size was estimated using Fisher's formula, assuming a 50% patient satisfaction rate, a 95% confidence level ($\alpha = 0.05$) and a precision of 10%, resulting in a required sample size of 160. Participants were selected from the sampling frame using a simple random sampling technique.

All selected beneficiaries were contacted through telephone. Verbal informed consent was obtained before conducting the interview. Each unreachable telephone number was attempted at least three times on three different days. Of the 160 beneficiaries selected, 50 could not be contacted because the telephone numbers were incorrect, switched off or unreachable, with such cases occurring more frequently among government hospital beneficiaries. In addition, 12 beneficiaries had died and 3 declined to participate. Consequently, only 95 beneficiaries were successfully interviewed during the one-month data collection period.

All interviews were conducted by the principal investigator using a standardized interview protocol. The investigator was familiar with the study objectives, questionnaire administration, ethical considerations and standardized interviewing



techniques. Neutral, non-leading questions were used throughout the interviews and participants were assured of the confidentiality of their responses to minimize interviewer and response bias.

A semi-structured questionnaire consisting of 25 items (Patient Satisfaction) was initially developed in English to collect information on socio-demographic characteristics, surgical characteristics and access to the TNCMCHIS scheme. The questionnaire was translated into Tamil using a forward-backward translation procedure to ensure linguistic equivalence. The translated version was reviewed by experts in public health and social sciences to establish content validity. Prior to the main survey, the questionnaire was pre-tested among 16 beneficiaries to assess its clarity and feasibility. The reliability of the instrument was evaluated using Cronbach's alpha, which yielded a coefficient of 0.80, indicating good internal consistency.

Socio-economic status was assessed using the Modified Kuppuswamy Scale for urban participants [13] and the Parikh Scale for rural participants [13]. Patient satisfaction with hospital services was assessed using the K.D. Rao Patient Satisfaction Questionnaire, a standardized instrument developed for the Indian population [14]. The questionnaire was translated into Tamil and pre-tested before administration. Participants were familiarized with the five-point Likert scale prior to the interview, where a score of 5 indicated "completely agree," 4 "agree," 3 "neutral," 2 "disagree," and 1 "completely disagree." Verbal informed consent was obtained from all participants before data collection.

Data were entered into Microsoft Excel and analyzed using SPSS version 24. Descriptive statistics were used to summarize the socio-demographic, surgical and TNCMCHIS-related characteristics of the study participants. Continuous variables were expressed as mean $\pm$ standard deviation, whereas categorical variables were presented as frequencies and percentages. The normality of continuous variables was assessed using the Shapiro-Wilk test. As the data satisfied the assumption of normality, differences between two independent groups were analyzed using the Independent Samples t-test. A two-tailed p-value of <0.05 was considered statistically significant.

One limitation of the study is the potential for selection bias arising from non-response. Although 1,600 eligible TNCMCHIS beneficiaries who had undergone cardiac surgery were identified from the hospital records, only 95 of the 160 randomly selected beneficiaries could be successfully interviewed because several participants could not be contacted, had died or declined to participate. Consequently, the findings may not fully represent the experiences of all eligible beneficiaries. Nevertheless, participants were selected using simple random sampling from the available sampling frame and

a standardized interview protocol was followed throughout the study to minimize selection and interviewer bias.

RESULTS

Total 1600 patients underwent surgeries for Coronary Heart Disease utilizing TNCMCHIS scheme (1074, 67.1% in government and 526, 32.9% in Private). Out of these 1210 (75.6%), were males and 390 (24.4%) were females. The average duration of stay in government hospitals was 16 days and in private 9 days. INR 55212/patient was reimbursed to government hospitals as compared to INR 66607/patient in private hospitals. Out of 1600, 472 (29.5%) had Cardiac Bypass; 958 (59.8%) Angioplasty and 170 (10.7%) had Conservative Management with Angiogram for Acute Myocardial Infarction (Secondary Data Analysis).

Mean age of 95 interviewed beneficiaries, 54.33 years (Male=54.05 years; Female=56.45 years). Most of them were males (88.4%). Two fifths (45.3%) belonged to Other Backward Castes, 16.8% to Scheduled Caste or Tribe and 22.1% to other Minority castes. Sixty three of beneficiaries lived in urban areas and the remaining came from distant rural areas. Most (63.1%) belonged to lower socio-economic status while 36.8% belonged to the middle class (Table 1).

Almost half of the beneficiaries were operated by Coronary Balloon Angioplasty (CBA) followed by Coronary Artery Bypass Graft Surgery and Cardio-Myogram. Only 4 patients from govt. and 2 from private hospitals reported any complications post-surgery. On an average patients stayed 14.25 days in govt. hospitals and only 6.95 days in private hospital while average money reimbursed per patient was less in government hospitals (INR 81238) as compared to private hospitals (INR 102375) Only one patient complained of any problem in accessing CMCHIS Scheme. More than half, 79(83.3%) first contacted Doctors for seeking support to avail CMCHIS Scheme benefits.

Eighteen beneficiaries (12 in govt.and 6 in private) had to spend money on medicines; 8 (6 in government and 2 in private) had spent on diagnostics and 7 in government and 1 in private gave money to hospital attendant staff. The mean amount spent on diagnostics was INR 14600 in government and INR 6667 in private institutions. On an average INR 2382 was spent on transportation in both. Overall 77.9% were very satisfied with accessibility of CMCHIS Scheme while 15.7% thought it could be improved and 6.4% were not satisfied.

Results regarding each question asked for patient Satisfaction are shown in Table 2. There was not much difference in absolute mean scores for patient satisfaction in government and private facilities. However, the statistical test showed significant p values in most of the attributes favourable towards private institutions.



Table 1: Characteristics of CMCHIS Scheme Beneficiaries for Cardiac Surgeries

Characteristics	N = 95	Percentage
Age		
30-40	11	11.5
41-50	22	23.1
51-60	37	38.9
>60	25	26.5
Gender		
Male	84	88.4
Female	11	11.6
Education		
Illiterate	48	50.5
Primary/Middle School	23	24.2
High School	19	20
Intermediate and above	5	5.3
Religion		
Hindu	70	73.7
Muslim	25	26.3
Caste		
General	15	15.8
Other backward caste	43	45.3
Scheduled Caste / Tribe	16	16.8
Minorities	21	22.1
Place of living		
Urban	63	66.3
Rural	32	33.7
Type of family		
Joint Family	52	54.7
Nuclear Family	43	45.3
Socio-economic status		
Lower class	60	63.1
Middle class	35	36.8
Type of surgical procedure		
Cardio-Mayogram	10	10.5
Coronary Balloon Angioplasty	53	55.8
Coronary Artery Bypass Graft (CABG)	32	33.7
CABG with Labp pump	0	0
First person to approach for availing the Scheme		
Directly this Hospital	79	83.3%
Local Govt. Health Institution	7	7.3
Local Private Physician	9	9.4
Satisfaction in accessing CMCHIS Scheme		
Very Satisfied	74	77.9
Can be better	15	15.7
Not Satisfied	6	6.4

Table 2: Patient Satisfaction of CMCHIS Scheme Beneficiaries for Cardiac Surgeries Independent T-test

S. No.	Question	Govt. n = 48, Mean (S.E.)	Pvt. N = 47, Mean (S.E.)	Total n = 95, Mean (S.E.)	p-value (<0.005)
1	Hospital has all medicines	4.64 (0.124)	4.91 (0.041)	4.77 (0.067)	0.000
2	I easily got medicines	4.63 (0.112)	4.81 (0.065)	4.73 (0.065)	0.029
3	Doctor (Dr.) gave me advice about Prevention and control measures	4.89 (0.053)	4.82 (0.092)	4.86 (0.053)	0.225
4	Dr. gave me complete information about diseases	4.85 (0.078)	4.93 (0.036)	4.89 (0.043)	0.054
5	Dr. gave me complete inform About treatment.	4.81 (0.092)	4.97 (0.021)	4.89 (0.048)	<0.001
6	Hospital employees talked politely.	4.72 (0.082)	4.97 (0.021)	4.85 (0.044)	0.000
7	Hospital employees offered Help.	4.71 (0.111)	4.98 (0.021)	4.84 (0.059)	<0.000
8	Dr. gave me enough time to express.	4.87 (0.070)	5	4.93 (0.036)	0.000
9	Dr. listened carefully to what I said	4.94 (0.035)	5	4.97 (0.018)	0.000
10	Dr. were eager to answer all my question.	4.91 (0.065)	5	4.95 (0.033)	0.011
11	I could easily find place for giving sample.	4.87 (0.076)	4.91 (0.085)	4.89 (0.056)	0.525
12	Hospital employee asked money for free service.	1.60 (0.185)	1.08 (0.085)	1.34 (0.105)	<0.000
13	Cleanliness of Hospital is satisfactory	4.45 (0.162)	4.89 (0.087)	4.67 (0.095)	0.000
14	Hospital toilets were in satisfactory condition.	4.20 (0.201)	4.82 (0.106)	4.51 (0.118)	0.000
15	Drinking water easily available.	3.95 (0.212)	4.93 (0.063)	4.44 (0.122)	<0.000
16	This Hospital Has all the utility Service.	4.56 (0.136)	5	4.77 (0.072)	<0.000
17	Dr. explained the need for Diagnostic tests	4.89 (0.085)	5	4.94 (0.043)	0.016
18	I could meet the specialist when I needed	4.81 (0.092)	4.93 (0.063)	4.87 (0.056)	0.037
19	Treatment were given attentively	4.79 (0.111)	5	4.89 (0.056)	0.000
20	Patient had to wait for longer emergency period	1.20 (0.107)	1.34 (0.155)	1.27 (0.097)	0.137



Table 2: Continued

S. No.	Question	Govt. n = 48, Mean (S.E.)	Pvt. N = 47, Mean (S.E.)	Total n = 95, Mean (S.E.)	p-value (<0.005)
21	I felt difficulties in getting dates and surgeries	1.43 (0.162)	1.21 (0.121)	1.32 (0.101)	0.033
22	I am dissatisfied with some care I got	1.33 (0.161)	1.10 (0.087)	1.22 (0.092)	0.012
23	I was able to access the service when I required	4.91 (0.065)	4.74 (0.144)	4.83 (0.078)	0.024
24	I am completely satisfied with the service	4.81 (0.092)	4.97 (0.021)	4.89 (0.048)	0.001
25	If in need I will come back to this hospital	4.87 (0.087)	4.93 (0.063)	4.90 (0.054)	0.283

DISCUSSION

CMCHIS Scheme is a well-known scheme in the state of Tamil Nadu and benefitted the people below poverty line. More proportion of subjects went to Government hospitals for treatment. It shows that Private hospitals are not showing interest in using CMCHIS. Duration of stay in private hospitals was almost half than the government hospitals however; the money reimbursed per patient was more for private hospitals. There was a gender imbalance as the proportion of female beneficiaries was lesser. Male being the bread earner and the dominant one is more likely to seek care than females. A similar kind of result was reflected in the study done by (Gopalan et al., 2025) Among the interviewed beneficiaries, only 16% belonged to the general caste, the rest all belonged to another backward or scheduled tribe or scheduled caste. The scheme is for below poverty line families but our study found that about 36.8% of beneficiaries belonged to the middle socio-economic class. Every beneficiary had to incur some transportation cost which was not reimbursed. A few had to spend some money on diagnostics and medicines [15]. Some mentioned that these expenses were incurred during the diagnosis elsewhere before reaching the institute for surgery. The Doctors provided support for most of the beneficiaries. Overall the beneficiaries were satisfied with the CMCHIS scheme.

CONCLUSIONS

While CMCHIS has significantly enhanced access to critical healthcare services for Tamil Nadu's underprivileged populations, there remain areas that require policy attention. Addressing gender disparities, refining eligibility assessments, enhancing the participation of private hospitals and mitigating out-of-pocket expenses are essential steps toward making CMCHIS more equitable and effective. Continued monitoring and responsive reforms will ensure the scheme continues to meet its objectives of universal and inclusive healthcare access.

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