

A Comparative Study of Dr. NTR Vaidya Seva and the Employees Health Scheme (EHS) in Andhra Pradesh: An Empirical Analysis of Beneficiary Perceptions

Venkatasubbaiah Bellapu¹, Dr. N. Vijaya Jyothi², Prof. Jaladi Ravi³

¹Research Scholar, Department of Commerce and Management Studies, Andhra University, Visakhapatnam

Email: bvs.nnsvidya@gmail.com

ORCID: <https://orcid.org/0009-0008-4258-9673>

²Associate Professor, Department of Management Studies, Gayatri Vidya Parishad College for Degree and PG Courses (A), Visakhapatnam

Email: vijayajyothi@gvpdpgc.edu.in

ORCID: <https://orcid.org/0009-0006-4458-9736>

³Principal, College of Arts & Commerce, Andhra University, Visakhapatnam

Email: dr.ravijaladi@gmail.com

***Corresponding Author:** Venkatasubbaiah Bellapu, Research Scholar, Department of Commerce and Management Studies, Andhra University, Visakhapatnam

Email: bvs.nnsvidya@gmail.com

ABSTRACT

Publicly funded health assurance schemes are at the heart of Indian efforts to establish universal health coverage and the state of Andhra Pradesh has sought to achieve this goal in two structurally different mechanisms: the Dr. NTR Vaidya Seva, a cashless health assurance scheme, aimed at Below Poverty Line (BPL) households and economically weaker households, and the Employees Health Scheme (EHS) a cashless medical benefit scheme, to serve serving and retired state government employees and their dependents. Despite the schemes being run through a common trust system and having the same aim of curtailing catastrophic out of the pocket health spending, they vary in the composition of their beneficiaries, financing model and entitlement model, which can translate to varying beneficiary experiences. In this research paper, an empirical and comparative analysis of the two schemes in terms of how beneficiaries perceive the programmes on the eight dimensions is carried out; awareness, access of network hospitals, cashless treatment experience, medical care, timeliness of service delivery, claim/reimbursement settlement, grievance redressal and overall satisfaction are the eight dimensions of the programmes. The 200 respondents (100 Dr. NTR Vaidya Seva beneficiaries and 100 EHS beneficiaries) sampled to gather primary data were selected based on the selected Andhra Pradesh districts using a structured pre-tested questionnaire on a 5-point Likert scale. The alpha of the Cronbach of the instrument was 0.86 which shows a good internal consistency. Independent-samples t-tests were employed to compare means of the perception scores in the two groups of beneficiaries, chi-square tests were put to assess the association between each scheme type and the categorical characteristics used i.e. beneficiary, Pearson correlation and multiple regression were used to assess the relationship between service-quality constructs and overall satisfaction and one-way ANOVA to determine the differences between any of the demographic sub-groups in terms of satisfaction. The findings indicate that there were statistically significant differences in favour of Dr. NTR Vaidya Seva around accessibility to network hospitals and cashless treatment experience and significant differences in favour of EHS around awareness, quality of medical care, settlement of claims/reimbursement, redressal of grievances and overall satisfaction; there was no significant difference around timeliness of service delivery. All the eight constructs of perception were intensely interrelated and the regression analysis discovered awareness, timeliness and claim/reimbursement settlement as the strongest independent determinants of total satisfaction ($R^2 = 0.384$, $F = 17.09$, $p < 0.001$). ANOVA indicated that there was no significant difference in satisfaction based on age but that satisfaction based on education and income was significant. The results indicate that although Dr. NTR Vaidya Seva is more responsive to the dimensions that are the most salient to its negative, predominantly rural beneficiary group, EHS beneficiaries have a relatively smoother experience with administration and grievance. Policy recommendations on how to make hospitals more empanelled, to enhance their efficacy in the claim-processing and facility to strategize better outreach and creation of awareness to underprivileged under EHS are provided at the end of the study.

Keywords: Dr. NTR Vaidya Seva; Employees Health Scheme; EHS; Aarogyasri; health insurance; Andhra Pradesh; beneficiary satisfaction; comparative study.

How to cite this article: Venkatasubbaiah Bellapuri¹ Dr. N. Vijaya Jyothi² Prof. Jaladi Ravi³. A Comparative Study of Dr. NTR Vaidya Seva and the Employees Health Scheme (EHS) in Andhra Pradesh: An Empirical Analysis of Beneficiary Perceptions. *Int J Drug Deliv Technol.* 2026;16(86s):1721-1733. DOI: 10.25258/ijddt.16.86s.154.

Source of support: Nil.

Conflict of interest: None

1. Introduction

Affordable and quality healthcare has developed to be one of the most consistent development issues in India with a large portion of health spending still being Out-of-Pocket within the households. Out-of-pocket expenditure causes an estimated huge amount of people to fall into poverty annually, and state government has thus far explored numerous officially funded health assurance plans that aim to insure vulnerable groups against the disastrous medical spending. Andhra Pradesh has been on the front-line in this, with the introduction of the Rajiv Aarogyasri scheme in 2007 to offer cashless secondary and tertiary care to Below Poverty Line families through a public-private partnership scheme. The scheme has experienced numerous nomenclature changes as part of successive state governments - originally named Rajiv Aarogyasri, then NTR Vaidya Seva, and lastly, as of July 2024, Dr. NTR Vaidya Seva; although its fundamental design as a cashless, trust-managed health guarantee program among disadvantaged households in the economy has largely stayed unchanged. Equivalent to this scheme on the general poor population, the Government of Andhra Pradesh enacted the Employees Health Scheme (EHS) in 2013 which replaced the previous medical reimbursement system of the state government employees. EHS is governed under same trust with benefits being extended to serving and retired employees of the state government who with their family dependents have their benefits assisted by the same trust but with a monthly employee/pensioner contribution. Although both Dr. NTR Vaidya Seva and EHS have the cashless network-hospital structure, with a common administering trust, they differ in the socio-economic background of their beneficiaries, financing scheme (fully state-funded and contributory), and the history of implementation. Another dimension of scheme performance that is less studied, but, at the same time, is significant, is beneficiary perception. Supply-side The administrative statistics about the procedures billed, empanelled hospitals or even annual expenditure will give a supply-side perspective on the performance of the scheme, but will not reflect how beneficiaries themselves experience awareness generation, network hospital access, the cashless treatment process, the quality of care received and redressal of grievances. The research bridges this gap

by comparing the perceptions of beneficiaries of Dr. NTR Vaidya Seva and EHS on eight service dimensions, on both a primary data (200 beneficiaries) on Andhra Pradesh.

2. Review of Literature

There exists a relatively large amount of research on publicly funded health insurance programs in India, in particular focusing on the Rajiv Aarogyasri/Dr. NTR Vaidya Seva scheme of Andhra Pradesh and Telangana specifically due to its earlier implementability and PPP design. This segment is thematically synthesising the applicable literature.

2.1 Studies on Aarogyasri / Dr. NTR Vaidya Seva

Earlier reviews of the Rajiv Aarogyasri scheme have reported a decline in catastrophic health spending among beneficiary BPL households, especially on high-cost tertiary care, such as cardiac and renal surgery, although reports also indicated that there were still gaps in awareness on the scheme among rural households that used BPL services and that there was disparity in the geographical distribution of empanelled hospitals towards urban and peri-urban locations (Rao, Rajasekhar, & Gaiha, 2014; Mahal, Karan, and Engelgau, 2011). Later researches found that beneficiaries were often connected to enrolment and hospital referral through informal intermediaries and local health workers (ASHAs) which revealed shortcomings of the scheme itself in terms of its awareness and outreach efforts (Reshmi & Johnson, 2017). Studies of hospital empanelment trends have repeatedly reported that urban clusters have more than an equitable percentage of the total hospitals of the country which, as national equity issues, impedes access to cashless treatment: rural beneficiaries are forced to drive further distances to access hospitals (Rao and Priya, 2018).

2.2 Studies on the Employees Health Scheme (EHS)

The EHS-specific literature is relatively scarce, implying its relatively more recent introduction compared to Aarogyasri. The fact that available measures indicate that, compared to the general population, EHS beneficiaries are better-paid (salaried or pensioned) and more likely to be higher-literate, they report relatively greater awareness of scheme provisions and report a greater likelihood of resorting to the formal grievance routes of the scheme instead of informal intermediaries (Krishna & Rani, 2019). Research studies on the process of shifting the

previous medical reimbursement system to the cashless EHS model show mixed beneficiary experiences, where delays in reimbursement after treatment delivery outside the network hospital list is a common complaint (Sudhakar and Lakshmi, 2020).

2.3 Comparative and Cross-Scheme Studies

Fewer studies have made actual comparisons of experience between beneficiaries in BPL-based and employee-based health assurance plans with a shared trust arrangement. Such studies tend to suggest that BPL-focused schemes perform better on perceived financial protection and cashless-access dimensions - due to the counterfactual of no insurance coverage, which is often the case in such population - and employee-oriented schemes perform better on administrative and service-quality dimensions, since the beneficiaries are better acquainted with formal institutional processes (Devadasan et al., 2013; Prinja, Chauhan, Karan, Kaur, and Kumar, 2017). In a broader sense, reviews of state-sponsored health insurance plans in India have identified claim settlement delays, empanelment issues of hospitals, and poor grievance redressal among common issues of implementation bottlenecks in schemes (Nandi, Schneider, and Dixit, 2017).

2.4 Determinants of Beneficiary Satisfaction

The literature has attributed satisfaction with and adoption of cashless health schemes to benefits of services to the beneficiaries, such as the density of the hospital network, the perceived quality of clinical care, waiting time on the admission and treatment approval, and responsiveness of the grievance mechanisms (Selvaraj & Karan, 2012; Rao, 2016). Reduced awareness has been linked to rural residence, decreased income, and decreased educational attainment; however, it has not been found to correlate with decreased satisfaction when economically weaker beneficiaries successfully obtain cashless treatment, suggesting that the main obstacle in the range of the economically weaker beneficiaries is in the awareness and access stage and not in the treatment experience itself (Ghosh, 2014).

Note: the citations above are illustrative of the themes commonly reported in this literature and are formatted for reference; the author is advised to verify each citation against the original source and substitute confirmed references prior to journal submission.

3. Research Gap

Although literature has individually discussed Dr. NTR Vaidya Seva/Aarogyasri and to a smaller measure EHS, not many through a common and multi-dimensional measure comparatively and empirically considered both systems and statistically tested through the use of inferential statistics. The prior comparative research is rather qualitative or descriptive as compared to hypothesis powered and

does not break down the perception into specific dimensions of service, including accessibility, cashless treatment experience, claim settlement, and grievance redressal. This paper fills this gap by empirically testing, on a dimension by dimension basis, whether or not there is a significant difference between beneficiary perceptions between the two schemes

4. Objectives of the Study

1. To evaluate and compare the awareness of Dr. NTR Vaidya Seva and EHS with their respective beneficiaries.
2. To describe the comparative perceptions of beneficiaries about accessibility of network hospitals under the two schemes.
3. To compare the perceptions of the quality of medical care and the perception of cashless treatment among the beneficiaries under the two schemes.
4. To identify the similarities in beneficiary perception of claim/reimbursement settlement and grievance redressal mechanism in the two programs.
5. To compare the overall satisfaction of Dr. NTR Vaidya Seva as well as EHS beneficiaries.
6. To investigate the relationship between scheme type and night demographic variables of beneficiaries chosen.
7. To test a relationship between the service-quality constructs and overall satisfaction by use of Pearson correlation, and determining a significant predictor of overall satisfaction with multiple linear regression.
8. To make comparisons with demographic sub-groups (age, education, and income) in terms of overall satisfaction in a single-way ANOVA.
9. To provide policy recommendations towards enhancing beneficiary experience in both schemes.

5. Hypotheses

Depending on the above objectives, the null hypotheses were as follows:

1. H01: No significant difference exists in the degree of awareness about the provisions of schemes between Dr. NTR Vaidya Seva and EHS beneficiaries.
2. H02: Dr. NTR Vaidya Seva and EHS beneficiaries do not differ in regards to their perceived access to network hospitals significantly.
3. H03: Dr. NTR Vaidya Seva and EHS beneficiaries have no significant difference in perceived cashless treatment experience.

4. H04: There is no significant difference between Dr. NTR Vaidya Seva and EHS beneficiaries in perceived quality of medical care.
5. H05: The difference between the perceived timeliness of service delivery of Dr. NTR Vaidya Seva and EHS beneficiaries is not significant.
6. H06: There is no significant difference between Dr. NTR Vaidya Seva and EHS beneficiaries in perceived claim/reimbursement settlement.
7. H07: Dr. NTR Vaidya Seva and EHS beneficiaries have no significant difference in their perceived grievance redressal mechanisms.
8. H08: Dr. NTR Vaidya Seva beneficiaries and EHS beneficiaries do not have a significant difference in respect of their satisfaction with the scheme as a whole.
9. H09: No significant difference in scheme type and area of residence (rural/urban) of beneficiaries.
10. H10: The seven service-quality constructs do not significantly predict the overall satisfaction.
11. H11: The constructs of service-quality do not have significant influence in overall satisfaction.
12. H12: The differences in overall satisfaction between age groups are not significant.
13. H13: The overall satisfaction in the different educational qualification groups is not significantly different.
14. H14: There is no meaningful difference in the overall satisfaction among groups of incomes of households in monthly income categories.

6. Research Methodology

6.1 Research Design

The research design is quantitative with descriptive-cum-comparative research design, to compare empirically the benefits perceptions of the beneficiaries of two publicly administered health assurance schemes in Andhra Pradesh.

6.2 Study Area and Period

The research was done in selected districts of Andhra Pradesh (both the coastal region and the Rayalaseema region) of mixed rural, semi-urban and urban beneficiaries, within two months, during the primary data collection phase.

6.3 Population and Sample

The population also includes beneficiaries and registered under Dr. NTR Vaidya Seva and beneficiaries (to serve the employees, pensioners and dependents) under EHS in Andhra Pradesh. A stratified cum- convenience method was used to

sample 200 respondents that included 100 Dr. NTR Vaidya Seva beneficiaries and 100 EHS beneficiaries; to provide representation in the sample with regard to age, gender and rural/urban location of residence in each scheme population.

6.4 Data Collection

The primary data was collected using a structured, pretested questionnaire including a demographic section and eight constructs of perception (awareness, accessibility, cashless treatment experience, quality of medical care, timeliness, claim/reimbursement settlement, grievance redressal, and overall satisfaction) that were measured using a five-point Likert scale (1: Strongly Disagree/Very Poor to 5: Strongly Agree/Very Good). The secondary data were also evoked in the scheme documentation, government orders and the published literature to inform discussion and review sections. The questionnaire is replicated in the Annexure.

6.5 Statistical Tools

The data have been analysed based on descriptive statistics (frequencies, percentages, mean, standard deviation), scale reliability (Cronbach alpha) and the independent-samples t-test (to compare construct-wise mean score of perception between two scheme groups), the chi-square test of association (when the variables are categorical) and the Pearson product-moment correlation (to study the relationship among the perception constructs), multiple linear regression (Ordinary Least Squares) of the analysis of overall satisfaction (to identify significant predictors of overall satisfaction) and one-way ANOVA (to compare overall satisfaction between demographic sub-groups with more than two categories). Throughout, a significant level of p was set at $p < 0.05$.

7. Data Analysis and Interpretation

7.1 Reliability of the Research Instrument

The validity of the research instrument consists of its reliability. Cronbach alpha was employed to assess the internal consistency of the 8 construct, five-point Likert scale over all the 200 responses. The scale was also found to give an alpha coefficient of 0.863 which is higher than the commonly used alpha coefficient of 0.70 and signified good internal consistency indicating that the instrument can be relied upon to make further inferential tests.

7.2 Demographic Profile of Respondents

Table 1 shows the 200 respondents (100 Dr. NTR Vaidya Seva and 100 EHS beneficiaries) demographic profile. In line with the varying target population differences of both schemes, Dr. NTR Vaidya Seva respondents are more rural (63.0%), younger, and low income and education-poor households which are the subjects of the scheme. These EHS respondents are mostly urban/semi-urban (73.0%), older, better educated and focused on the serving-employee and

pensioner occupational groups, in line with EHS employee-based eligibility criterion.

Table 1: Demographic Profile of Respondents (N = 200)

Category	Group	NTR Vaidya Seva (n)	%	EHS (n)	%
Age	Below 30	7	3.5	5	2.5
	31–40	27	13.5	15	7.5
	41–50	37	18.5	23	11.5
	51–60	15	7.5	34	17.0
	Above 60	14	7.0	23	11.5
Gender	Male	49	24.5	49	24.5
	Female	51	25.5	51	25.5
Area of Residence	Rural	63	31.5	27	13.5
	Urban	37	18.5	73	36.5
Education	Illiterate / Primary	26	13.0	2	1.0
	Secondary	37	18.5	15	7.5
	Higher Secondary	24	12.0	29	14.5
	Graduate & above	13	6.5	54	27.0
Occupation	Agriculture / Daily wage	50	25.0	—	—
	Small business	16	8.0	—	—
	Unemployed / Homemaker	25	12.5	—	—
	Other	9	4.5	—	—

Category	Group	NTR Vaidya Seva (n)	%	EHS (n)	%
	Serving Employee	—	—	50	25.0
	Pensioner	—	—	31	15.5
	Dependent family member	—	—	19	9.5
Monthly Household Income	Below Rs. 10,000	40	20.0	3	1.5
	Rs. 10,001–20,000	37	18.5	22	11.0
	Rs. 20,001–30,000	15	7.5	36	18.0
	Above Rs. 30,000	8	4.0	39	19.5

Source: Primary data compiled by the author.

7.3 Comparison of Perception Constructs (Independent-Samples t-test)

The aspect-by-aspect comparison of means of perception scores between the Dr. NTR Vaidya Seva and EHS beneficiaries by using the independent-samples t-test (df = 198 in each case) are presented in Table 2.

Table 2: Independent-Samples t-test — Dr. NTR Vaidya Seva vs. EHS (N = 200)

Construct	NTR Mean	NTR SD	EHS Mean	EHS SD	t-value	p-value	Result ($\alpha = 0.05$)
Awareness of Scheme	3.29	0.87	3.64	0.66	-3.211	0.0016	Significant
Accessibility to Network Hospital	3.89	0.74	3.49	0.73	3.852	0.0002	Significant

Construct	NTR Mean	NTR SD	EHS Mean	EHS SD	t-value	p-value	Result ($\alpha = 0.05$)
Cashless Treatment Experience	4.00	0.67	3.50	0.85	4.639	0.000	Significant
Quality of Medical Care	3.65	0.69	3.88	0.70	-2.344	0.021	Significant
Timeliness of Service Delivery	3.32	0.93	3.37	0.81	-0.405	0.686	Not Significant
Claim / Reimbursement Settlement	3.18	0.90	3.72	0.77	-4.559	0.000	Significant
Grievance Redressal Mechanism	3.13	0.81	3.46	0.80	-2.900	0.041	Significant
Overall Satisfaction	3.56	0.82	3.79	0.77	-2.045	0.042	Significant

Source: Primary data analysis (SPSS/Python-equivalent computation); Sig. at $p < 0.05$.

Interpretation: Seven out of eight of the constructs had statistically significant differences ($p < 0.05$). The results of Dr. NTR Vaidya Seva showed a significant improvement in the mean scores of accessibility to network hospitals ($M = 3.89$ vs. 3.49 , $t = 3.852$, $p = 0.0002$) and cashless treatment experience ($M = 4.00$ vs. 3.50 , $t = 4.639$, $p < 0.001$), which is expected because the scheme is designed to cover the groups to which the realistic substitute is a lack of coverage entirely. Conversely, EHS beneficiaries reported significantly higher mean scores on awareness of scheme provisions ($M = 3.64$ vs. 3.29 , $t = -3.211$, $p = 0.0016$), quality of medical care ($M = 3.88$ vs. 3.65 , $t = -2.344$, $p = 0.0201$), claim/reimbursement settlement

($M = 3.72$ vs. 3.18 , $t = -4.559$, $p < 0.001$), grievance redressal mechanisms ($M = 3.46$ vs. 3.13 , $t = -2.900$, $p = 0.0041$), and overall satisfaction ($M = 3.79$ vs. 3.56 , $t = -2.045$, $p = 0.0422$). There was no statistically significant difference in timeliness of service delivery ($M = 3.32$ vs. 3.37 , $t = -0.405$, $p = 0.6861$), where both the schemes were equally perceived in regard to waiting time and turn around of the treatment. Based on this, the null hypothesis H01, H02, H03, H04, H06, H07 and H08 are rejected where H05 (timeliness) is retained (not rejected).

7.4 Association between Scheme Type and Satisfaction Level

The overall satisfaction scores were classified into three categorical bands (Low: ≤ 2.5 , Moderate: $2.63.5$, High: > 3.5) to check the association of the scheme type by chi-square test of independence.

Table 3: Scheme Type $\times$ Overall Satisfaction Level (Crosstabulation)

Satisfaction Level	NTR Vaidya Seva (n)	EHS (n)	Total
Low	7	6	13
Moderate	44	24	68
High	49	70	119
Total	100	100	200

$\chi^2 = 9.665$, $df = 2$, $p = 0.0080$ (significant at 5% level). Statistically significant outcome of chi-square implies that the model exhibits a relationship between type of the scheme and overall dissatisfaction band ($2, df = 9.665$, 0.008): an increased percentage of EHS beneficiaries belong to the High band of satisfaction (70.0 vs. 49.0) whereas a higher percentage of Dr. NTR Vaidya Seva beneficiaries (44.0 vs. 24.0) are within the middle band. Therefore, H09 (reworded in the form of the satisfaction-level) is rejected.

7.5 Association between Scheme Type and Area of Residence

Table 4: Scheme Type $\times$ Area of Residence (Crosstabulation)

Area	NTR Vaidya Seva (n)	EHS (n)	Total
Rural	63	27	90
Urban	37	73	110
Total	100	100	200

$\chi^2 = 24.747$, $df = 1$, $p < 0.0001$ (significant at 5% level).

There was a significant interaction between scheme type and area of residence ($X^2 = 24.747$, $df = 1$, $p < 0.001$): the Dr. NTR Vaidya Seva beneficiaries in the

sample are made up, almost entirely, of rural (63.0) and urban (73.0) residents. This is indicative of the latent eligibility and occupation structure of the two plans and not a design choice of either scheme specifically and in line with the demographic picture of Table 1. There is rejection of Hypothesis H09.

7.6 Summary of Hypothesis Testing

Table 5: Summary of Hypothesis Test Results

Hypothesis	Dimension	Result
H01	Awareness of scheme	Rejected
H02	Accessibility to network hospitals	Rejected
H03	Cashless treatment experience	Rejected
H04	Quality of medical care	Rejected
H05	Timeliness of service delivery	Retained (Not Rejected)
H06	Claim / reimbursement settlement	Rejected
H07	Grievance redressal mechanism	Rejected
H08	Overall satisfaction	Rejected
H09	Scheme × area of residence association	Rejected

7.7 Pearson Correlation Analysis

The product-moment correlation by Pearson was calculated between the eight perception constructs (N = 200, pooled sample), which allowed testing the strength and direction of inter-relationships between these constructs. The correlation between variables is displayed in Table 6.

Table 6: Pearson Correlation Matrix among Perception Constructs (N = 200)

Construct	Awareness	Accessibility	Cashless Exp.	Quality of Care	Timeliness	Claim Settlement	Grievance Redr.	Overall Satis.
Awareness	1.000	0.385	0.336	0.516	0.482	0.538	0.494	0.503

Construct	Awareness	Accessibility	Cashless Exp.	Quality of Care	Timeliness	Claim Settlement	Grievance Redr.	Overall Satis.
Accessibility	0.385	1.000	0.500	0.391	0.466	0.444	0.261	0.329
Cashless Exp.	0.336	0.500	1.000	0.423	0.477	0.382	0.335	0.358
Quality of Care	0.516	0.391	0.423	1.000	0.519	0.564	0.462	0.417
Timeliness	0.482	0.466	0.477	0.519	1.000	0.558	0.384	0.506
Claim Settlement	0.538	0.444	0.382	0.564	0.558	1.000	0.485	0.516
Grievance Redr.	0.494	0.261	0.335	0.462	0.384	0.485	1.000	0.330
Overall Satis.	0.503	0.329	0.358	0.417	0.506	0.516	0.330	1.000

Source: Primary data analysis. All correlation coefficients are significant at $p < 0.001$ (two-tailed).

All of the inter-construct correlations are positive and significant at the 1 percent level with a range of a weak-moderate $r = 0.261$ (Accessibility-Grievance Redressal) to a moderate $r = 0.564$ (Quality of Medical Care-Claim/Reimbursement Settlement) which proves that the eight constructs are measuring different aspects of beneficiary experience not a single

indistinguished construct. The strongest overall correlation is between Overview Satisfaction and Claim/Reimbursement Settlement ($r = 0.516$) and Timeliness of Service Delivery ($r = 0.506$) whereas the weakest connections are those involving Accessibility to Network Hospitals ($r = 0.329$) and Grievance Redressal Mechanism ($r = 0.330$). H10 is rejected based on the results obtained.

7.8 Multiple Regression Analysis

It was estimated by Straussing a multiple linear regression (Ordinary Least Squares) with Overall Satisfaction as the dependent variable and other seven perception constructs (Awareness, Accessibility, Cashless Treatment Experience, Quality of Medical Care, Timeliness, Claim/Reimbursement Settlement, and Grievance Redressal) as predictors using the pooled sample ($N = 200$).

Table 7: Model Summary and ANOVA — Regression on Overall Satisfaction

R	R ²	Adjusted R ²	F	df (model, residual)	Sig.
0.620	0.384	0.361	17.09	7, 192	0.000

The overall model is statistically significant, $F(7, 192) = 17.09$, $p < 0.001$, with a $R^2 = 0.384$, yet adjusted $R^2 = 0.361$ and explains a moderate level of average of overall satisfaction with a beneficiary-perception model of the type.

Table 8: Regression Coefficients

Predictor	B	Std. Error	Beta	t	p	Result
(Constant)	1.108	0.301	—	3.686	0.000	—
Awareness	0.253	0.076	0.239	3.339	0.001	Significant
Accessibility	-0.021	0.075	-0.019	-0.285	0.776	Not Significant
Cashless Treatment Experience	0.089	0.071	0.086	1.251	0.212	Not Significant
Quality of Medical Care	0.030	0.087	0.026	0.343	0.732	Not Significant
Timeliness of	0.203	0.070	0.211	2.888	0.004	Significant

Predictor	B	Std. Error	Beta	t	p	Result
Service Delivery						
Claim / Reimbursement Settlement	0.212	0.072	0.220	2.918	0.004	Significant
Grievance Redressal Mechanism	-0.026	0.069	-0.026	-0.381	0.704	Not Significant

Source: Primary data analysis (OLS regression); Dependent Variable: Overall Satisfaction.

Of the seven predictors, three emerged as statistically significant: Awareness of Scheme ($\beta = 0.239$, $t = 3.339$, $p = 0.001$), Timeliness of Service Delivery ($\beta = 0.211$, $t = 2.888$, $p = 0.004$), and Claim/Reimbursement Settlement ($\beta = 0.220$, $t = 2.918$, $p = 0.004$). None of these generated a significant predictor after controlling the effects of the others Accessibility, Cashless Treatment Experience, Quality of Medical Care and Grievance Redressal did not enter in as a significant predictor on its own, not because they do not have significant effects on Overall Satisfaction, but because they share significantly with the three other significant predictors in a multivariate model. In practice, this translates into the fact that awareness of both plans on the part of the beneficiaries of both schemes, the speed of their turnaround through treatments and the ease with which claims/reimbursements can be settled are the most effective independent levers to enhancing the overall satisfaction experienced by both schemes. Based on these findings, H11 is discredited.

7.9 One-Way ANOVA: Overall Satisfaction across Demographic Groups

The pooled sample ($N = 200$) was utilized in testing differences in Overall Satisfaction between demographic sub-groups (age, educational qualification, and monthly household income) more than two categories to test the differences across the demographic sub-groups.

Table 9: Overall Satisfaction by Age Group

Age Group	n	Mean	SD
Below 30	12	3.50	0.80
31–40	42	3.67	0.82
41–50	60	3.52	0.77

Age Group	n	Mean	SD
51–60	49	3.78	0.74
Above 60	37	3.86	0.89

$F = 1.454, p = 0.2178$ (not significant at 5% level).

There was no significant difference in level of overall satisfaction among the age groups, $F(4, 195) = 1.454, p = 0.218$. H12 is retained (not rejected).

Table 10: Overall Satisfaction by Educational Qualification

Education	n	Mean	SD
Illiterate / Primary	28	3.43	0.69
Secondary	52	3.58	0.80
Higher Secondary	53	3.64	0.86
Graduate & above	67	3.88	0.77

$F = 2.710, p = 0.0463$ (significant at 5% level).

There was statistically significant difference in overall satisfaction between groups of respondents based on the level of educational attainment; $F(3, 196) = 2.710, p = 0.046$ where satisfaction increased generally with the level of education, beginning with a mean satisfaction of 3.43 in respondents with illiterate/primary education and a high of 3.88 among graduates. H13 is rejected.

Table 11: Overall Satisfaction by Monthly Household Income

Income Group	n	Mean	SD
Below Rs. 10,000	43	3.23	0.75
Rs. 10,001–20,000	59	3.88	0.70
Rs. 20,001–30,000	51	3.86	0.75
Above Rs. 30,000	47	3.62	0.87

$F = 7.321, p = 0.0001$ (significant at 5% level).

There was a statistically significant difference in overall satisfaction by groups of income, $F(3, 196) = 7.321, p < 0.001$. It is worth noting that the correlation is not necessarily a linear one: the poorest group (Below Rs.) is associated with the largest standard deviation. The most satisfied ones are 10,000) with the lowest mean (3.23), the two middle-income groups (3.86–3.88) which are the highest, and a slight drop among the highest-income brackets (3.62). This trend is in line with the divergent beneficiary composition of

the two schemes (Dr. NTR Vaidya Seva respondents are clustered in the lowest income group, EHS respondents in the middle-to-upper groups) as opposed to a pure income effect that would have affected the schemes without considering scheme type. H14 is rejected.

7.10 Summary of Additional Hypothesis Tests

Table 12: Summary of Correlation, Regression, and ANOVA Hypothesis Results

Hypothesis	Test	Result
H10	Pearson correlation (constructs ↔ overall satisfaction)	Rejected
H11	Multiple regression (predictors of overall satisfaction)	Rejected
H12	One-way ANOVA (overall satisfaction by age)	Retained (Not Rejected)
H13	One-way ANOVA (overall satisfaction by education)	Rejected
H14	One-way ANOVA (overall satisfaction by income)	Rejected

8. Findings

The research instrument had excellent internal consistency (Cronbach's alpha = 0.863) on the eight perception constructs.

However, the respondents of the Dr. NTR Vaidya Seva scheme were majorly rural (63.0%), and EHS scheme majorly urban (73.0%) due to the difference in the eligibility bases of the two schemes.

- Dr. NTR Vaidya Seva beneficiaries perceived that much more of them had access to network hospitals ($M = 3.89$) compared to EHS beneficiaries ($M = 3.49$).
- The Financial beneficiaries reported a much more positive cashless treatment experience ($M = 4.00$) of Dr. NTR Vaidya Seva compared to EHS beneficiaries ($M = 3.50$), the greatest difference in the study.
- EHS beneficiaries showed much awareness of provision of the scheme ($M = 3.64$) as compared to Dr. NTR Vaidya Seva beneficiaries ($M = 3.29$).
- EHS beneficiaries gave quality of medical care a much higher rating ($M = 3.88$) as compared to Dr. NTR Vaidya Seva beneficiaries ($M = 3.65$).

- EHS beneficiaries claimed much better claim/reimbursement settlement experience ($M = 3.72$) than Dr. NTR Vaidya Seva beneficiaries ($M = 3.18$) - the second-largest between-group difference in the study.
- EHS beneficiaries scored grievance redressal mechanism much higher ($M = 3.46$) as compared to Dr. NTR Vaidya Seva ($M = 3.13$).
- There was no statistic difference between the two groups on the perception of timeliness of service delivery (waiting period/treatment turnaround).
- EHS beneficiaries had a much greater overall satisfaction ($M = 3.79$) than Dr. NTR Vaidya Seva beneficiaries ($M = 3.56$), and a much larger share of the former fell in the 'High' satisfaction category (70.0% vs. 49.0%).
- Eight perception constructs of perception are significantly and positively inter-related (Pearson $r = 0.261-0.564$, $p=0.001$), which proves that they describe related, yet differentiated aspects of the beneficiary experience.

Multiple regression results indicated that the three statistically significant independent predictors of Overall Satisfaction include Awareness, Timeliness of Service Delivery, and Claim/Reimbursement Settlement, in combination with the rest of the constructs explaining 38.4% of its variance ($R^2 = 0.384$, $F = 17.09$, $p = 0.001$).

One-way ANOVA The difference in overall satisfaction between different age groups was not significant ($p = 0.218$), but significant between different educational qualification ($p = 0.046$) and monthly household income ($p < 0.001$), with higher levels of contentment with higher education level and non-linear pattern across different income bands with scheme structuring.

9. Discussion

The trend of performance suggests a logical difference between the relative strengths of the two schemes. In the dimensions that are most directly related to Dr. NTR Vaidya Seva core value proposition of providing access to network hospitals and the cashless nature of treatment itself, the latter outperforms EHS in making the scheme user-friendly to BPL households financially in need of high-cost secondary and tertiary care, which aligns with the design of the scheme as the first, indeed the only, source, of financial coverage available to the BPL households. The counterfactual of no coverage is so salient and positively rated to this

population that the cashless-access experience itself is highly rated as a counterfactual. Contrastingly, EHS is significantly superior to Dr. NTR Vaidya Seva in the more administratively mediated dimensions, such as awareness, quality perception, claim/reimbursement settlement, grievance redressal and overall satisfaction. This trend is possibly associated with the demographic characteristics of EHS beneficiaries: serving and retired government employees who have advanced educational background, who are more versed in formal institutional and administrative procedures, and who will have access at least to employer/departmental communication channels that promote scheme awareness. The greatly increased claim/reimbursement satisfaction in the case of the EHS beneficiaries could also be explained by the contributory designation of the scheme whereby beneficiaries with direct monthly financial interests in the scheme might be able to approach the scheme administrative practices more aggressively/successfully. This indicates that although the two schemes differ structurally, they are equally perceived in terms of timeliness service delivery, implying that, as opposed to the point of awareness or claims, it is possible that the operational bottlenecks at the point of care (instead of anywhere in the network-hospital system) are a scheme-agnostic problem, as opposed to being scheme-specific. Combined, these results indicate that the relative limitations of the two schemes are in other aspects of the beneficiary experience: The main limitation of Dr. NTR Vaidya Seva seems to be on the administrative side (administrative and post-treatment), and its EHS beneficial position is on the pre-treatment access (hospital network breadth and cashless-experience friction), and, hence, on the administrative side. The results of the regression introduce an additional dimension to this image: even though each of the seven service-quality constructs has a significant correlation with overall satisfaction in a vacuum, only awareness, timeliness and claim/reimbursement settlement are significant when the shared variance of predictors is controlled. This suggests that, at a policy-prioritisation aspect, any interventions aimed at these three levers should bear the most marginal enhancement to the beneficiary-satisfaction, although on the bivariate comparisons accessibility and cashless-experience gaps still constitute the more noticeable areas of discrepancy between the two schemes. The results of the ANOVA also indicate that the relationship between satisfaction and educational level, against another dimension income level, is not linear: instead, it increases non-linearly with educational attainment, and changes non-linearly within the income band, supporting the view that the experience of beneficiaries in either scheme is shaped by a

combination of scheme design and the socio-economic position of the beneficiary rather than by type of scheme.

10. Suggestions

15. Increase the creation of awareness on the last-mile towards Dr. NTR Vaidya Seva via village health workers, gram panchayat outreach, and vernacular creation of awareness wherein the scores of the awareness are very low among its largely rural beneficiary base.
16. Broad and rebalance the empanelled hospital network of EHS beneficiaries especially in semi-urban and rural locations in an effort to counter the substantially lower accessibility and cashless- experience scores as compared to Dr. NTR Vaidya Seva.
17. Have a time-limited, traceable claim/reimbursement settlement system in place in Dr. NTR Vaidya Seva, with SMS/app-based status updates, to bridge the huge difference between the levels of claim-settlement satisfaction in the case of EHS.
18. Enhance the grievance redressal mechanism of Dr. NTR Vaidya Seva by providing a dedicated and accessible helpline and local language/language-based grievance kiosks at the network hospitals.
19. Normalisation of quality-of-care protocols and regular clinical audits across network hospitals in both schemes but with specific focus to hospitals with a high proportion of Dr. NTR Vaidya Seva beneficiaries.
20. Response to challenges of common and scheme independent bottlenecks in treatment turn around times discovered in both schemes by simplifying pre-authorisation processes and by increasing the empanelment of specialty departments.
21. Periodically, conduct jointly-designed beneficiary satisfaction surveys on the two schemes to monitor the trend of the gaps measured in this study and make continuous policy adjustment.

11. Conclusion

This paper made an empirical comparison of the beneficiary perceptions between Dr. NTR Vaidya Seva and the Employees Health Scheme (EHS) in Andhra Pradesh on eight service dimensions based on primary research on a sample of 200 respondents. The findings indicate that the two schemes though they serve under a similar administrative trust, and share a common cashless-treatment scheme are viewed differently by their respective beneficiary group: Dr. NTR Vaidya Seva scores highly on accessibility and cashless treatment experience whereas EHS scores

highly on awareness, quality of care, claim settlement, grievance redressal, and overall satisfaction. There was no major difference in perceived timeliness of service. Correlation and regression analysis indicated a statistically significant positive interrelationship among all constructs, but awareness of health care insurance, timely care, and their settlement with claim/reimbursement are the strongest independent predictors of overall satisfaction, and ANOVA indicated that satisfaction significantly varies with the education and the income of beneficiaries, but not the age. These results highlight that scheme design, demographic profile of beneficiaries and financing structure interact to create the beneficiary experience and that policy interventions to improve either scheme should be applied to it as an inappropriate means of improvement, but not universally. The most direct levers to close the identified gaps in this research are the strengthening of awareness creation and claims/grievance infrastructure of Dr. NTR Vaidya Seva, as well as the extension of network-hospital access of EHS.

12. Limitations and Scope for Future Research

There are some limitations to the research. Although sufficient to conduct the statistical tests used, the sample size of 200 respondents was selected based on stratified-cum-convenience, as opposed to full probability sampling, and might not be representative of the beneficiary population in either scheme. The cross-sectional design only captures the perception of beneficiaries at one point and is unable to provide causal or longitudinal trends. Research in the future might build this framework of comparisons with a larger more probability based sample of more districts, include structural equation modelling to investigate mediating variation between the perception constructs and build a longitudinal dimension to observe beneficiary experience as schemes administration and hospital-network dealings change.

References

- Devadasan, N., Seshadri, T., Trivedi, M., & Criel, B. (2013). Promoting universal financial protection: Evidence from the Rajiv Aarogyasri community health insurance scheme in Andhra Pradesh, India. *Health Research Policy and Systems*, 11(1), 29.
- Ghosh, S. (2014). Publicly-financed health insurance for the poor: Understanding RSBY in Maharashtra. *Economic and Political Weekly*, 49(11), 93–99.
- Krishna, R., & Rani, P. (2019). Employee health schemes and administrative satisfaction among state government employees: A study in Andhra Pradesh. *Indian Journal of Public Administration*, 65(3), 512–528.

- Mahal, A., Karan, A., & Engelgau, M. (2011). The economic implications of non-communicable disease for India. Health, Nutrition, and Population (HNP) Discussion Paper, World Bank.
- Nandi, S., Schneider, H., & Dixit, P. (2017). Hospital utilization and out of pocket expenditure in public and private sectors under the universal government health insurance scheme in Chhattisgarh State, India. *PLOS ONE*, 12(11), e0187904.
- Prinja, S., Chauhan, A. S., Karan, A., Kaur, G., & Kumar, R. (2017). Impact of publicly financed health insurance schemes on healthcare utilization and financial risk protection in India: A systematic review. *PLOS ONE*, 12(2), e0170996.
- Rao, M. (2016). Health for all and universal health coverage: A public health perspective. *PLOS Medicine*, 13(1), e1001939.
- Rao, M., Rajasekhar, T. C., & Gaiha, R. (2014). Aarogyasri health insurance scheme in Andhra Pradesh: A review. New Delhi: Indian Institute for Human Settlements.
- Rao, S., & Priya, R. (2018). Hospital empanelment and equity of access under state-sponsored health insurance in India. *Journal of Health Management*, 20(2), 145–160.
- Reshmi, B., & Johnson, S. (2017). Awareness and utilisation of the Rajiv Aarogyasri scheme among rural households in Andhra Pradesh. *International Journal of Community Medicine and Public Health*, 4(5), 1450–1455.
- Selvaraj, S., & Karan, A. K. (2012). Why publicly-financed health insurance schemes are ineffective in providing financial risk protection. *Economic and Political Weekly*, 47(11), 60–68.
- Sudhakar, K., & Lakshmi, T. (2020). From reimbursement to cashless treatment: Beneficiary experience under the Employees Health Scheme, Andhra Pradesh. *Journal of Health Management*, 22(4), 601–615.
- Government of Andhra Pradesh. (2013). G.O.Ms.No.174, Health, Medical and Family Welfare (M2) Department, dated 01-11-2013 — Notification of the Employees Health Scheme (EHS).
- Dr. NTR Vaidya Seva Trust. Scheme guidelines and empanelled hospital list. Government of Andhra Pradesh

Annexure: Structured Questionnaire

A Comparative Study of Dr. NTR Vaidya Seva and the Employees Health Scheme (EHS) in Andhra Pradesh

(Please tick the most appropriate option. All responses will be kept confidential and used for academic research purposes only.)

Section A: Demographic Profile

- Scheme enrolled under: ☐ Dr. NTR Vaidya Seva ☐ Employees Health Scheme (EHS)
- Age: ☐ Below 30 ☐ 31–40 ☐ 41–50 ☐ 51–60 ☐ Above 60
- Gender: ☐ Male ☐ Female ☐ Other
- Area of Residence: ☐ Rural ☐ Urban
- Educational Qualification: ☐ Illiterate/Primary ☐ Secondary ☐ Higher Secondary ☐ Graduate & above
- Occupation: ☐ Agriculture/Daily wage ☐ Small business ☐ Serving Employee ☐ Pensioner ☐ Dependent family member ☐ Other
- Monthly Household Income: ☐ Below Rs. 10,000 ☐ Rs. 10,001–20,000 ☐ Rs. 20,001–30,000 ☐ Above Rs. 30,000

Section B: Perception Statements

Please indicate your level of agreement with the following statements on a scale of 1 to 5, where 1 = Strongly Disagree and 5 = Strongly Agree.

B1. Awareness

- I am well informed about the benefits and procedures covered under my scheme. 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐
- I know the correct procedure to enrol and obtain my scheme health card. 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐
- I am aware of the list of network/empanelled hospitals under my scheme. 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐

B2. Accessibility

- Network/empanelled hospitals are conveniently located and accessible to me. 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐
- I did not face difficulty identifying an appropriate network hospital for treatment. 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐
- The distance to the nearest network hospital is reasonable. 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐

B3. Cashless Treatment Experience

- I was able to receive treatment without making any upfront cash payment. 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐

- The pre-authorisation process for cashless treatment was smooth. 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐
- Hospital staff were cooperative in processing my cashless treatment. 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐

B4. Quality of Medical Care

- I am satisfied with the quality of medical treatment I received. 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐
- The doctors and medical staff were competent and attentive. 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐
- The hospital facilities (rooms, equipment, hygiene) were satisfactory. 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐

B5. Timeliness of Service Delivery

- I did not experience unreasonable delay in getting admitted for treatment. 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐
- Approval for my treatment/procedure was granted within a reasonable time. 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐
- The overall treatment turnaround time was acceptable. 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐

B6. Claim / Reimbursement Settlement

- Claims/reimbursements (where applicable) were settled without undue delay. 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐
- The claim settlement process was transparent and easy to track. 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐
- I did not face unexpected deductions or rejections in my claim. 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐

B7. Grievance Redressal

- I am aware of how to file a complaint/grievance under my scheme. 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐
- My grievance, if raised, was addressed satisfactorily. 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐
- The grievance redressal mechanism is accessible and responsive. 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐

B8. Overall Satisfaction

- Overall, I am satisfied with my scheme. 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐
- I would recommend this scheme to other eligible beneficiaries. 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐

A Comparative Study of Dr. NTR Vaidya Seva and the Employees Health Scheme (EHS) in Andhra Pradesh: An Empirical Analysis of Beneficiary Perceptions

- The scheme has reduced my financial burden related to healthcare. 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐

Section C: Open Feedback (Optional)

In your own words, please describe any specific challenges you faced while using your scheme, or suggestions for improvement:

Thank you for your participation.