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Original Article

Paediatrics Section

Public–Private Partnership in Health Care: A Comparative Cross-sectional Study of Perceived Quality of Care Among Parents of Children Admitted in Two Government District-hospitals, Southern India

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ABSTRACT

Introduction: Perceived better quality of care draws lower socio-economic classes of Indians to more expensive private setups, leading to poverty illness poverty cycle. Urgent measures need to be taken to improve perceived quality of public hospitals. The present study compares the difference in perceived quality of care among parents of children admitted at two government district hospitals.

Materials and Methods: A cross-sectional, comparative, questionnaire based study was conducted between February 2011 and February 2012 at Government medical college hospitals of two district headquarters in South-India: one with private-public-partnership (PPP-model); another directly operated by government - Public Hospital-model (PH-model).

A total of 461 inpatients from the PH model hospital and 580 from the PPP model hospital were eligible. Patients who left against advice (LAMA) (n=44 in PH and 19 in PPP) and expired (n=25 in PH and 59 in PPP) were excluded. Fourteen incomplete forms from PH and 10 from PPP model hospital were also excluded. Responders rated perception on a 1-5 scale in each domain: accessibility of health-facility, time spent waiting, manner and quality of physician, manner and quality of nurse, manner and quality of supporting staff, perception of equipment, explanation of treatment details and general comfort. The responders also rated overall satisfaction on a 1-10 scale. In the 1-5 scale, rating≥4 in each domain was considered good. Rating≥8 in 1-10 scale was considered satisfaction.

Results: Responders from PPP-model hospital were significantly more satisfied than those from PH-model {n=529 (91.2%) vs. n=148 (32.1%) p<0.001}. This was true even when controlled for age-group, sex, maternal education, family-type, days of hospital-stay and socioeconomic class {O.R.(CI) =23.58 (16.13-34.48); p<0.001} by binary logistic regression model. In the PPP-model hospital the time spent waiting for treatment {4.28(2.07-8.82), p<.001} and manner of support staff {3.64(1.02-12.99), p=0.04} significantly predicted satisfaction. In PH-model hospital explanation given regarding treatment details significantly predicted overall satisfaction {2.99(1.61-5.54), p<.001}.

Conclusion: Perceived quality of hospital care, as evidenced by the satisfaction and perception ratings of responders, was better in PPP-model hospital. This model could be emulated in developing countries to draw patients of lower socio-economic classes to tertiary-care public hospitals which are less expensive.

Keywords: PPP, Public hospitals, Paediatric, Patient satisfaction

INTRODUCTION

Patient expenditure in public hospitals of India is considerably lesser as compared to the private facilities. However the quality of care in private facilities is perceived to be better [1]. The patients treated in the public hospitals are not satisfied due to overcrowding, poor infrastructure and longer waiting time [2]. These factors contribute to patients seeking care at private facilities despite the higher costs [3]. The costs are managed by selling assets or borrowing money for interest [1]. These spending results in further deepening of poverty among the poor [4]. This process could be halted by improving the perceived quality at public hospitals.

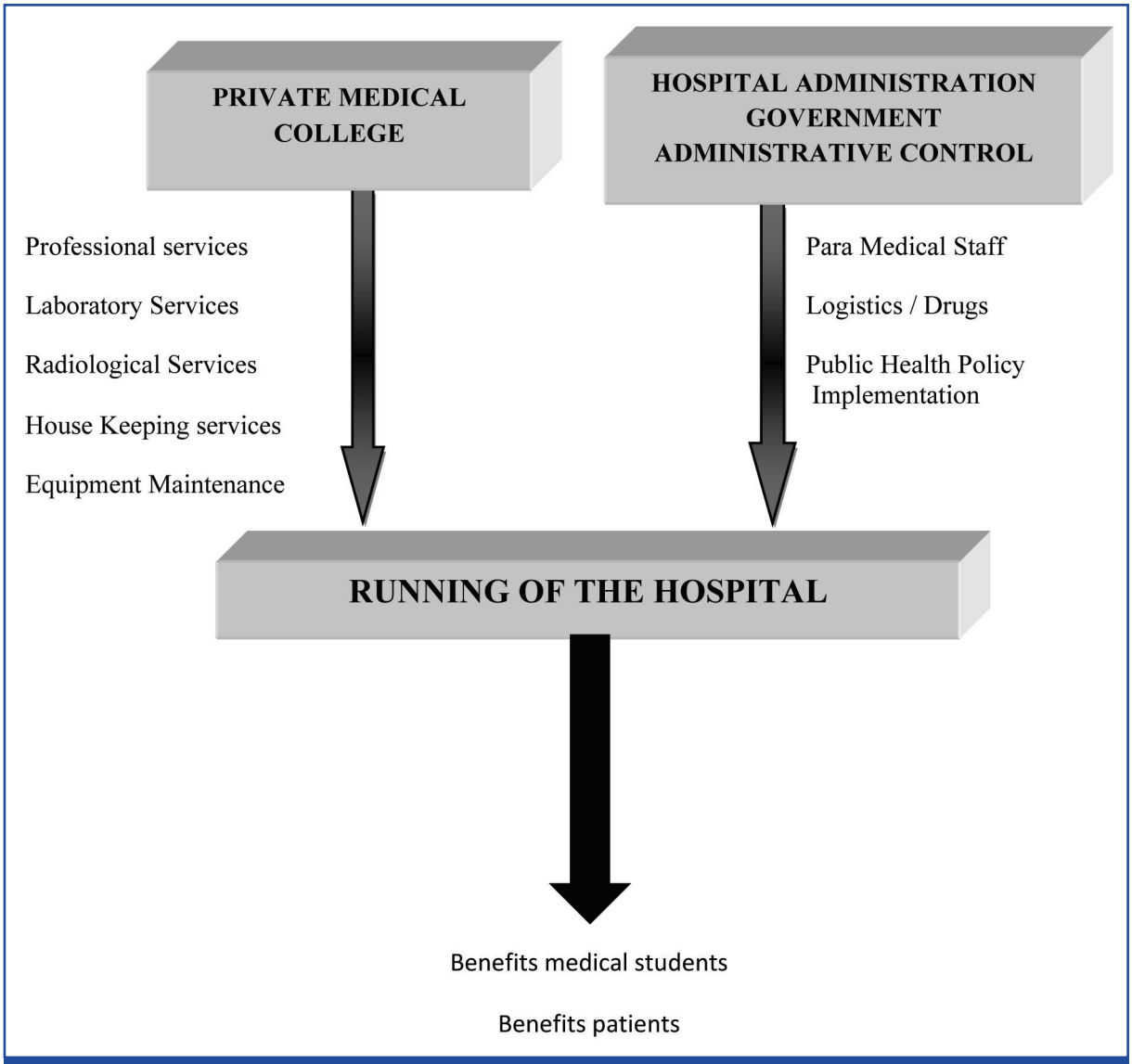
Government district hospitals cater to the tertiary medical care needs of the local community at free cost or subsidized rates. Few such district hospitals have been upgraded to government medical college hospitals. More such hospitals are being upgraded in a phased manner to tackle the shortage of doctors and to provide better quality of health care. Wherever resources become a constraint, the upgradation would be based on a private partnership (PPP) model [5-7].

The present study was to probe if there was a difference in the perceived quality of care among parents of children admitted at two medical college hospitals in two district headquarters of Southern India, one run with PPP model and the other directly operated by the government (PH model).

MATERIALS AND METHODS

Cross-sectional, hospital based study was conducted in two tertiary care medical college hospitals which were situated at two district headquarters in southern India. The Public Health model (PH model) hospital was fully controlled by the government whereas the public private partnership (PPP) model hospital was under the administrative control of the government with routine services being provided by the private medical college. The summary of the public private partnership model in one of the hospitals is depicted in [Table/Fig-1].

The sample was a convenience sample. Patients admitted between 10am to 12 noon on weekdays were enrolled. Data was collected after Institutional ethics committee permission by pretested questionnaires, filled by parents of inpatients from February 2011



[Table/Fig-1]: PPP Model

to February 2012. Informed consent was obtained from parents of enrolled patients.

A minimum sample size of 448 in each hospital was required based on an earlier study done in a government medical college hospital in Northern India [8] that showed 74% satisfaction, to detect a difference of 10% in the satisfaction levels among the responders in the two hospitals with a power of 90% with a pα 5%.

Parents who left against advice (LAMA) (n=44 in PH and 19 in PPP) and parents of children who expired (n=25 in PH and 59 in PPP) were excluded from the study. Incomplete forms from PH (14) and PPP model (10) hospital were also excluded. A total of 461 in patients from the PH model hospital and 580 from the PPP model hospital were finally eligible to be included in the study.

Structured pretested questionnaire in local language Kannada was used to collect details of the perceived quality of health care. The questionnaire had domains regarding the location and accessibility of health facility, time spent waiting, manner and quality of physician, manner and quality of nurse, manner and quality of other supporting staff, perception of equipment, explanation of treatment details and the general comfort. Details of parent's perception were rated on a 5 point scale ranging from 1-5 in each of these domains. Besides this the parent was also asked to rate the overall satisfaction on a scale ranging from 1-10. Four or more in the 5 point scale in each domain was considered good rating. Parents of patients were considered to be satisfied overall when they rated eight and more in the scale of 10 points. Questionnaire was filled by parents of paediatric patients at discharge and anonymity was maintained. A pre-trained medical social worker helped the parents in case they could not fill it by themselves.

STATISTICAL ANALYSIS

Data were entered in SPSS version 17. Descriptive statistics like mean, percentages were calculated. Chi-square test and t-test were used to compare the data of the two hospitals. Binary logistic regression analysis was done to see if difference in patient satisfaction between the two hospitals was due to socio-demographic factors. Overall satisfaction was considered dependent and hospital type with various demographic factors as covariates. Age group was divided into newborn and child; socio-economic class by Kuppuswamy classification [9] into higher (classes 1,2 and 3 combined) and lower (class 4 and 5 combined); hospital stay into more than 10 days or less. The predictive value of the individual perception domains on the overall satisfaction was calculated for each hospital using binary logistic regression by entering overall satisfaction as dependent and each of the domains as covariates. The p-value of less than 0.05 was considered significant.

RESULTS

[Table/Fig-2] shows the comparison between PPP model hospital and PH model hospital with regards to clinical work, infrastructure, human resources and outcome. The PH model had greater number of inpatients and deliveries. However the overall intensive care facilities and were better in PPP model hospital enabling it to manage very sick children in contrast to PH model hospital.

Parameter for comparison	PPP model District Hospital	PH model District Hospital
Clinical inpatient work load, absolute numbers in year 2012		
Neonatal Intensive Care Unit admissions	1250	1779
Pediatric Intensive Care Unit + pediatrics ward admissions	2540	6453
Deliveries	5545	6094
Neonatal Intensive Care Unit cases ventilated	128	4
Pediatric Intensive Care Unit cases ventilated	78	None
Beds and equipments in intensive care units		
Total NICU beds available	23	07
Level III beds in NICU available	3	Nil
Human resources, in absolute numbers		
Doctors		
Consultants	17	20
Residents	26	10
Nursing personnel	61	20
House- keeping staff	24	12
Death/ LAMA statistics, as percentage of admissions (absolute numbers)		
Deaths in the hospital	6.2% (236)	3.6% (276)
LAMA in the hospital	1.5%(57)	14.6% (1204)

[Table/Fig-2]: Basic comparison between PPP model and PH model district hospitals. Abbreviations used in [Table/Fig-1]
NICU- neonatal intensive care unit, PICU- pediatric intensive care unit, LAMA- left against medical advice

	PPP model, n=580, n (%)	PH model, n=461, n (%)	p*
Age group			
Neonate	197 (34)	156 (33.8)	0.96
Child	383 (66)	305 (66.2)	
Sex, male	366 (63.1)	283 (61.4)	0.57
Fathers education, High-school and above	233 (40.2)	129 (28)	<.001
Mothers education, High-school and above	223 (38.4)	89 (19.3)	<.001
Socioeconomic class (Kuppuswamy)			
Upper	0	0	<.001
Upper middle	36 (6.2)	18 (3.9)	
Lower middle	142 (24.5)	172 (37.3)	
Upper lower	390 (67.2)	269 (58.4)	
Lower	12 (2.1)	2 (0.4)	
Family type, nuclear	445 (76.7)	246 (53.4)	<.001
Hospital stay, days, mean (SD)	14.18 (11.74)	10.67 (7.14)	<.001†
Hospital stay>10 days	307 (52.9)	214 (46.4)	0.03
Outcome			
Cured	545 (94)	437 (94.8)	0.64
Uncured	21 (3.6)	12 (2.6)	
Referred	14 (2.4)	12 (2.6)	
Satisfaction rating, mean (SD)	8.9 (1.34)	6.7 (1.35)	<.001†
Satisfied overall (rating≥8/10)	529 (91.2)	148 (32.1)	<.001
Visit hospital again	550 (94.8)	337 (73.1)	.001
Recommend others	565 (97.4)	334 (72.5)	<.001

[Table/Fig-3]: Comparison of the demographic features and overall satisfaction ratings between study population of PPP model and PH model hospitals.
* - chi-square test used to compare frequencies
†–'t' test used to compare means.

Socio-demographic features of inpatients enrolled are depicted in [Table/Fig-3]. There were no significant differences in the age-group, sex and outcomes of inpatients of two hospitals. Socio-economic class and parental education were higher in parents of children admitted at PPP model hospital. Hospital stay at PPP model hospital was longer.

The parents of inpatients of PPP model hospital were significantly more satisfied than those of PH model hospital {O.R. (CI)=23.58 (16.13-34.48); p<0.001} even when controlled for age-group, sex, maternal education level, type of family, hospital-stay and socioeconomic class by binary logistic regression model.

[Table/Fig-4] shows comparison of perception among parents of inpatients admitted in two hospitals with regards to different domains. Among the category of responders who had overall satisfaction (satisfaction rating ≥8 in the 1-10 scale) from PPP model, perceived the care as good (rating ≥4 in the 1-5 scale) in most domains compared to their counterparts from PH model.

The domains of patient perception that were significant predictors of overall satisfaction are shown in [Table/Fig-5]. In PPP model hospital duration of time spent waiting for treatment and manner of other support staff were significant predictors for overall satisfaction while other domains were less influencing on parental satisfaction. In the PH model hospital counseling regarding treatment was a significant positive influencing factor of overall satisfaction. However, lack of equipment had negative influence on satisfaction in PH model hospital.

DISCUSSION

The present maiden study reports advantage of public private partnership (PPP) in improving functioning of a public tertiary care hospital with regards to perceived quality of care by the beneficiaries. There was significantly increased satisfaction level among parents of children treated as inpatients at PPP model government district hospital compared to the other directly managed and operated by the government (PH model). These differences were present even when the various demographic parameters were controlled thus indicating positive influence of the model in providing better health care. The overall satisfaction level among responders of PPP model hospital was 91.2% which was similar to 93% reported in a private-for -profit setup in India [10]. It was higher than 74.1% reported in another tertiary care public hospital [8] and 79.5% in a charity hospital [11]. A 97.4% of the responders in the PPP model hospital would recommend it to others compared to 91.2% reported in a private hospital of North India [10]. Thus associating a district hospital to a private medical college could be considered as one of the measures to improve health care delivery to poorer sections of the community.

A study done in Bangladesh comparing private and public hospitals reported better satisfaction of patients treated in private sector

	Overall Satisfied, n=676 Rating≥8/10			Overall not satisfied, n=364 Rating≤7/10		
Parameter*	PPP, n=529 (100%)	PH, n=148 (100%)	p	PPP, n=51 (100%)	PH, n=313 (100%)	p
Convenience of location of health facility, good	114 (21.6)	37 (25)	NS	2 (3.9)	82 (26.2)	<.001
Length of time spent waiting, good	389 (73.5)	76 (51.4)	<.001	14 (27.5)	101 (32.3)	NS
Personal manner of physician, good	364 (68.8)	92 (62.2)	NS	17 (33.3)	153 (48.9)	.039
The quality of physician, good	377 (71.3)	96 (64.9)	NS	19 (37.3)	170 (54.3)	.024
Personal manner of nurse, good	347 (65.8)	50 (33.8)	<.001	16 (31.4)	48 (15.3)	.01
The quality of nurse, good	345 (65.2)	51 (34.5)	<.001	16 (31.4)	52 (18.8)	.021
Personal manner of other support staff, good	302 (57.1)	30 (20.3)	<.001	9 (17.6)	20 (6.4)	.013
The quality of other support staff, good	302 (57.1)	30 (20.3)	<.001	11 (21.6)	18 (5.8)	<.001
Equipment, good	323 (61.1)	45 (30.4)	<.001	20 (39.2)	95 (30.4)	NS
General comfort	321 (60.7)	33 (22.3)	<.001	20 (39.2)	19 (6.1)	<.001
Explanation of what was done for the child, good	344 (65)	43 (29.1)	<.001	20 (39.2)	25 (8)	<.001

[Table/Fig-4]: Comparison of patient perception of health care at the 2 hospital models PPP and PH.
*Rating≥4/5 indicates good

in all respects except physician attributes [12]. Thus the quality of patient care as evidenced by patient satisfaction in the PPP model government tertiary care hospital of the present study is similar to the private-for-profit sector with an added advantage of it being within the monetary reach of the middle and lower socio-economic classes.

The poor satisfaction and patient perception ratings noted in the PH model hospital of the present study can be attributed to increased workload, poor infrastructure, inadequate facilities and human resources [Table/Fig-2]. Similar observations were made in a study done in a public tertiary care hospital in central India [2].

In the present study, among the group of responders who were overall satisfied, there were significant inter-hospital differences in perception of parents in all the domains of care except towards physician attributes. This suggests inability to provide quality care by 'doctor centric' approach. In the group of responders from PH model hospital who was unsatisfied also perceived that hospital lagged in every domain except for physician attributes in addition to accessibility of health facility. Thus importance needs to be given to ensure paramedical and housekeeping personnel along with good uninterrupted logistic support. The above findings are in concurrence with studies which reported that patient dissatisfaction was due to factors other than nursing and physician care [2,11].

	PPP model Hospital Odds-ratio (95% C.I.)	PH model Hospital Odds-ratio (95% C.I.)
Convenience of location of health facility, good	4.08 (0.93-17.86)*	0.76 (0.46-1.25)*
Length of time spent waiting, good	4.28 (2.07-8.82), p<.001	1.64 (0.96-2.79)*
Personal manner of physician, good	1.14 (0.32-4.03)*	0.81 (0.41-1.57)*
The quality of physician, good	1.40 (0.34-5.67)*	0.95 (0.51-1.76)*
Personal manner of nurse, good	1.31 (0.42-4.06)*	1.26 (0.56-2.81)*
The quality of nurse, good	0.85 (0.27-2.62)*	1.38 (0.63-3.01)*
Personal manner of other support staff, good	3.64 (1.02-12.99), p=0.04	1.77 (0.61-5.15)*
The quality of other support staff, good	1.21 (0.36-4.03)*	1.18 (0.40-3.47)*
Equipment, good	0.58 (0.19-1.81)*	0.49 (0.28-0.86), p=0.01
General comfort, good	0.54 (0.17-1.74)*	1.80 (0.83-3.90)*
Counseling of parents, good	1.22 (0.43-3.44)*	2.99 (1.61-5.54), p<.001

[Table/Fig-5]: The impact of patient perception of health care in the various domains on overall satisfaction.
*p-value- not significant
The predictive value of the individual perception domains on the overall satisfaction was calculated for each hospital using binary logistic regression by entering overall satisfaction (satisfaction rating >8 in the 1-10 scale) as dependent and each of the domains (good rating ≥4 in the 1-5 scale) as covariates

In the PPP model hospital, duration of time spent in waiting for treatment and personal manner of other support staff predicted overall satisfaction. This finding concurs with findings of studies done in different settings and in various countries [13-18]. A systematic review article also points that the public sector frequently lacks in timeliness and hospitality towards patients [19]. In the PH model hospital, the explanation of treatment details to bystanders had a significant positive effect and perception about lack of equipment had a significant negative impact on overall satisfaction. Physician communication and information given to patients has found to impact patient satisfaction in other studies [18,20]. [Table/Fig-6] compares the findings of the present study with studies done in private and public hospitals in similar settings [8,10-12, 21].

Various PPP models are being implemented in healthcare sector in India. Radiological, pharmacy, canteen services have been contracted out to the private. Services of private have been availed for emergency transport and mobile diagnostic/healthcare facilities. Chiranjeevi Yojna provides institutional deliveries to poor women through private obstetricians. Besides these health insurance schemes like Yashaswini involves private hospitals. The management of primary health centers, community health centers and super-specialty hospital has been outsourced to the private in several states [22]. [Table/Fig-7] compares the present model with the models where private organization runs the hospital services. The PPP model in the present study has several advantages. The government gains by reduced expenditure on salary head, high end treatment, available professional expertise and effective budget utilization. The trained doctors contribute to addressing the problem of shortage of doctors in the country. The private organization operates the medical college and gains in terms of available clinical material for teaching medical students and reduced capital expenditure. The private medical college runs the hospital services efficiently so as to ensure that there is an increased influx of patients to train its students and meet medical council requirements. The public gains by the advanced modalities of treatment at free cost or highly subsidized rates. This model could bring patients to the more affordable public hospitals thereby reducing families getting trapped in the poverty–illness-poverty cycle.

Study	Setting	Findings
Sodani PR et al., [21]	Inpatients of a multi super speciality hospital in North India.	Highest level of satisfaction was found for interpersonal manner (86.3%) followed by communication (85.4%), general satisfaction (79.3%), and technical quality (77.3%). Least level of satisfaction was found for financial aspects (61.6%), followed by hospital services (68%), accessibility and convenience (73.5%), and time spent with doctor (76.9%).
Siddiqui N et al., [12]	Bangladeshi citizens who were in-patients in public or private hospitals in Dhaka city or in hospitals abroad within the last one year.	The quality of service in private hospitals scored higher than that in public hospitals for nursing care, tangible hospital matters, i.e. cleanliness, supply of utilities, and availability of drugs.
Kodali RR et al., [11]	Inpatients of a private medical college hospital, Andhrapradesh India.	The satisfaction expressed was more with nursing services followed by doctors and billing and least with housekeeping.
Kumar S et al., [10]	Inpatients of a private tertiary care hospital in India.	The participants reported a high level of overall satisfaction (93%) as well as high satisfaction with physicians (95%), the doctor's interpersonal skills (99%), nursing-care (93%), general services (94%), and pharmacy (88.1%).
Akoijam BS et al., [8]	Inpatients of a government medical college hospital (Regional Institute) of northeast India.	Most of the patients (74.1%) were satisfied with the overall care received. Patients were found to be unsatisfied in the domains pertaining to admission procedure (41.3%), comfort and cleanliness (46.7%), food service (55.3%).
Present study Baliga S et al.,	Parents of inpatients admitted in a government hospital in PPP with a private medical college and another government hospital fully operated by government (PH-model).	Responders from PPP-model hospital were significantly more satisfied than those from PH-model [n=529 (91.2%) vs. n=148 (32.1%) p<0.001]. In the PPP-model hospital the time spent waiting for treatment [4.28 (2.07-8.82), p<.001] and manner of support staff [3.64 (1.02-12.99), p=0.04] significantly predicted satisfaction. In PH-model hospital explanation given regarding treatment details significantly predicted overall satisfaction [2.99 (1.61-5.54), p<.001].

[Table/Fig-6]: Table comparing the findings of present study with those done in various private and public hospitals with similar settings.

Case	Private partner	Services	Benefits to public
Present study: Regional Advanced Pediatric Care Center, Government Wenlock Hospital, Mangalore, Karnataka	Private Medical College	Medical, surgical, Laboratory, Radiological, House Keeping services, Maintenance of Equipment.	The public gains by the advanced modalities of treatment at free cost or highly subsidized rates.
Shamlaji Hospital, Sabarkantha District, Gujarat	NGO	Quality health care, through community health center.	Free immunization; sterilisation, diagnosis and treatment of poor people.
Karuna Trust, Bangalore Karnataka	NGO	Management of Primary Health centres (PHC).	Services free of cost for diagnosis, treatment, medications.
Arpana Swasthya Kendra, Delhi	NGO	Management of a maternity health centre.	Medical and diagnostic services, maternal and child care services, Lab tests, select surgeries are free to the poor patients.

[Table/Fig-7]: Table comparing the benefits and services of various public private partnership models similar to the present study

LIMITATION

This is a cross-sectional study with a convenience sample of in patients. The differences observed in the two hospitals may be due to different expectations in the responders [23]. Since the study was questionnaire based socially appropriate responses cannot be ruled out. However this deficiency has been partially offset by usage of a 5 point scale.

CONCLUSION

In conclusion the perceived quality of health care as evidenced by the satisfaction and perception ratings of responders was significantly better with the PPP model hospital. This model could be emulated in other tertiary care public hospitals of developing countries.

Contributors: BSB conceived and designed the study, acquired data, involved in analysis and interpretation of data, revised it critically for important intellectual content; SRR analysed and interpreted the data, drafted the article; SSR and AJ co-conceived the study, acquired data; revised it critically for important intellectual content;, AC was involved in data acquisition and critical revision. The final manuscript was approved by all the authors.

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