PATIENT SATISFACTION SURVEY OF AYURVEDA TEACHING HOSPITALS OF KARNATAKA, INDIA

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ABSTRACT

Background: Patient satisfaction in health care system is regarded as an outcome variable to assess the quality care since yester years. It also measures the degree of accomplishment of any therapy. Patient satisfaction largely depends up on the service, care, facility, cost, availability, approachability, communication, appearance and perceived benefit of the system. Hence there is a need to explore these aspects in teaching hospitals attached to Ayurveda colleges in India as there is no work is conducted so far on the basis of Chikitsa Chatushpada (therapeutic quadruple) mentioned in Ayurveda.

Methods: Cross-sectional survey study (using prevalidated self-administered questionnaire) was conducted on patient satisfaction based upon qualities of therapeutic quadruple (Chikitsa Chatushpada) of Ayurveda. Pre-validated questionnaire was administered to 527 patients treated in in-patient departments of teaching hospitals attached with nine Ayurveda colleges spread across Karnataka state, India.

Results: Service rendered by physician has highest ranking with 88.06% score; followed by nursing service with 82.69% score. Patient (self-assessment) stands in 3rd place with 80.69% and medication / treatment in 4th place with least score of 77.64%. ($p<.001$). Even the average percentage of agreement on individual pada also followed same order.

Conclusion: The results reflect the patient satisfaction about Ayurveda healthcare system especially selected nine teaching hospitals.

Keywords: Ayurveda, therapeutic quadruple, Chikitsa Chatushpada, healthcare evaluation, patient satisfaction, quality of care, survey study, questionnaire method

INTRODUCTION:

Success in therapeutics is one of the goal of any healthcare system. This involves various factors influencing the efficiency from both the provider and user end. In Ayurveda, among the various factors, the four aspects of therapeutics dealing with the physician, medication / therapy, medical attendant and patient occupy an important position to deliver quality healthcare and patient satisfaction [1]. Patient satisfaction is the extent to which the patients feel that their needs and expectations are being met by the service provided [2]. There is evidence that satisfied patients are more likely to comply with treatment, keep follow up appointments and utilize health services [3]. Current literature search did not yield any reference in the field of Ayurveda. In the present scenario, where Ayurveda is gaining global acclaim, there is strong need for Ayurveda health professionals to take patient satisfaction seriously as a measurement of quality healthcare extended to community.

Hence the study was planned to do survey on patient satisfaction who are receiving the care from in-patient departments of hospitals attached to Ayurveda College spread across Karnataka state using prevalidated questionnaire. Conceptual frame work of whole study was based upon the 16 qualities of 4 quadruple (pada) namely physician (Vaidya), medicine (Aushadha), medical attendants (Upasthata), and patient (Rogi); each having four qualities [4]. Based on these, questionnaire was designed to elicit feelings, belief, experience and response / agreements of patients toward these qualities of therapeutic components [5].

Objective: The survey study was conducted to assess patient satisfaction of in-patients about the quality of healthcare service and patient self-assessment in nine teaching hospitals attached to Ayurveda academic institutions in Karnataka state, India.

METHODS:

SURVEY STUDY:

Survey study was conducted using pre-validated self-administered questionnaire [5], which was prepared by pooling information on patient-satisfaction with reference to physician (Vaidya), medication / therapy (Aushadha), medical attendant (Paricharaka) and patient (Rogi). The same were distributed to patients treated in in-patient departments of teaching hospitals of nine Ayurveda Colleges of Karnataka state, India. The responses were summarised and outcome were assessed.

Methodology of Survey Study:

Study Design: Cross-sectional survey study conducted between August, 2012 and February, 2013. Written informed consent was obtained from all study participants. Ethics clearance was obtained from Institutional Ethics Committee of Sri Dharmasthala Manjunatheshwara College of Ayurveda and hospital, Hassan, Karnataka

Survey Method: Self-administered questionnaire in Kannada language (local dialect). In **Table 1** validated questionnaire with details of domains and subdomains with items graded in Likert scale from 5 to 1 format with maximum score presented. Score 5 on the Likert scale representing strong non-agreement and score 1 indicating strong agreement and score 3 presenting neutral position as 'don't know'.

Table 1: Domains and subdomains of prevalidated questionnaire

Component	Quality	No. of items	Item	Maximum score
Physician (Vaidya)	Dexterity or technical quality of the doctor (Daksha)	3	1-3	15
	Physician with excellence in medical knowledge gained from preceptor (Shruta/ Teerthartha Shastrartha)	3	4-6	15
	clinical expertise or the wisdom gained through demonstrations, extensive practical experience through constant persuasion (Drustakarma)	2	7-8	10
	Cleanliness or hygiene with respect to personal, social and behavioural aspects (Shuchi)	2	9-10	10
	Subtotal Score			50
Medication (Dravya)	Availability of medicine in abundance (Bahuta)	3	11-13	15
	Medication having desired quality (Bahuguna)	2	14-15	10
	Medications having required potency/ effectiveness to cure the disease (Sampat)	2	16-17	10
	Prescription of suitable medications (Yogya)	3	18-20	15
	Subtotal	10		50
Medical attendant (Paricharaka)	Affectionate, involved towards patients (Anurakta)	3	21-23	15
	Knowledge regarding disinfection, personal, social and behavioral hygiene(Shoucha)	2	24-25	10
	Skilfulness in nursing care according to type ailments and in assisting in all types of therapies (Dakshya)	3	26-28	15
	Intelligent, expertness in the work (Buddiman) / effective care taking including preparation of diet, medicines and nursing (Upacharajnata)	3	29-31	15
	Subtotal	11		55
Patient (Rogi)	Fearlessness (Abhirutva) / affordability (Adhya)	3	32-34	15
	Obedience/ treatment compliance (Nirdeshakaritva)	3	35-37	15
	Ability to withstand (Sattvan)	2	38-39	10
	Good memory for comprehensive ecommunication (Smruti)	3	40-42	15
	Subtotal	11		55

Sampling Frame: It consists of the patients treated in in-patient departments of teaching hospital attached with nine Ayurveda colleges spread across Karnataka state.

Sample Size: The sample size was calculated using the formula, n = Z2 $_{(1-\alpha/2)}$pq / d2(where Z$_{(1-\alpha/2)}$ = 1.96 at 95% confidence; p = prevalence of patient satisfaction, q=1p ; d=absolute allowable error). For this study, research presumed maximum variability, hence p=0.8; q=0.2; d =10%. Sample size thus yielded is of 500 Adding 10% for incomplete answers, the total number was 550. 557 filled questionnaires were received out of which 527 were complete and rest incomplete. Incomplete questionnaires were excluded.

Sampling Technique: Purposive sampling

Inclusion Criteria: Patients admitted in in-patient department whose length of stay in the hospital was 5 days and longer were counted.

Exclusion Criteria: A "new" or "referred" patient admitted in inpatient department of the respective health care facility, patients working in the healthcare facility and too ill to fill the questionnaire were excluded.

Collection, tabulation of data and statistical tests:

Patients were given sufficient time from half an hour to 24 hours to complete the questionnaire. The completed questionnaires were collected and the data entry was carried out in SPSS software version 20 **[6]**. The responses to the questionnaire were entered in the 'numerical' format and data entry, data cleaning was performed. The responses were summarised and outcome were assessed with relevant statistical tests like Chi square and one sample t test to elicit patient satisfaction.

Patient satisfaction was calculated by points scored for each quadruple (Pada) and percentage score was calculated.

Results:

Demographic profile of 527 participants with respect to teaching hospital surveyed, type of institution, ward, gender, age, education, profession and socio-economic status are presented in **Table 2**. Percentages of response of related to agree and strongly agree (Likert scale 1-5) are added to give summated % of agreement on particular item. Non-parametric Chi-square test shows that there is significant difference between observed and expected values (df=4, x^2= 731.814 p=.000). Chi-square test was performed to test the quality of distribution data among the population selected for survey.

Table 2: Demographic profile of 527 participants

Teaching hospitals surveyed		
College-1 - 43 (8.2%)	College-4 -41 (7.8%)	College-7 -87 (16.5%)
College-2 - 40 (7.6%)	College-5 -3 (.6%)	College-8 -78 (14.8%)
College-3 -18 (3.4%)	College-6 -176 (33.4%)	College-9 -41 (7.8%)
Type of Institution		
Govt 130 (24.7%)	Aided-60 (11.4%)	Private 337 (63.9%)
Ward		
General Ward – 380 (58.4%)	Semispecial ward – 83 (15.7%)	Special ward – 136 (25.8%)
Gender		
Male – 250 (47.4%)	Female – 277 (52.6%)	
Age		
<18 yrs - 15 (2.8%)	41-50 yrs – 122 (23.1%)	>70 yrs – 21 (4%)
19-30 yrs – 121 (23%)	51-60 yrs – 94 (17.8%)	
31-40 yrs – 103 (19.5%)	61-70 yrs – 51 (9.7%)	
Education		
Uneducated – 76 (14.4%)	Degree – 184 (34.9%)	Did not responded – 19 (3.6%)
Primary – 76 (14.4%)	Postgraduate – 11 (2.1%)	
Pre university – 127 (24.1%)	other education – 34 (6.5%)	
Profession		
Unemployed – 195 (37%)	Skilled worker – 42 (8%)	Profession – 23 (4.4%)
Unskilled worker – 31 (5.9%)	Clerical, Shop-owner, Farmer – 128 (24.3%)	Did not responded – 43 (8.2%)
Semi-skilled worker – 8 (1.5%)	Semi-Profession – 57 (10.8%)	
Socio Economic Status		
Upper (I) – 11 (2.1%)	Lower Middle (III) – 103 (19.5%)	Lower (V) – 73 (13.9%)
Upper Middle (II) – 96 (18.2%)	Upper Lower (IV) – 201 (38.1%)	Did not respond – 43 (8.2%)

Questionnaire findings on perceived quality of care rendered by attending physician, perceived quality of medication, perceived service extended by medical attendant, self-assessment of patients are presented in **Table 3, 4, 5 and 6** respectively.

Table 3: Questionnaire findings on perceived quality of care rendered by attending physician

Sl	Quality	Item	Patient Agreement (n=527)	X^2	P
1	Dexterity or technical quality of the doctor (Daksha)	Patients believe and feel that the treating physician is experienced in treating the kind of health problem that they are suffering with	96.2%	731.81	<.001
2		Patients opined that doctor who is treating him listens carefully to what I have to say	97.5%	727.848	<.001
3		patients believe and feel that doctor never exposes them to unnecessary risks	92.6%	621.87	<.001
4	Physician with excellence in medical knowledge gained from preceptor (Shruta/ Teerthartha Shastrartha)	Patients feel and believe that doctor has planned treatment after necessary investigations needed for diagnosis of ailment	94.9%	664.148	<.001
5		Patients believe that doctor who is treating them have good knowledge about various diseases	88%	556.273	<.001
6		Patients opined that doctor has answered questions asked by him about the treatment symptoms and complication	94.3%	657.886	<.001
7	clinical expertise or the wisdom gained through demonstrations, extensive practical experience through constant persuasion (Drustakarma)	Patients feel that the doctor who is treating them is having good practical knowledge	93.9%	642.630	<.001
8		Patients feel that doctor who treats them is more thorough in treatment aspect	94.3%	650.410	<.001
9	Cleanliness or hygiene with respect to personal, social and	Patients opined that doctor who treats him is patient and replies to all questions regarding the diseases	93.1%	626.899	<.001
10		Patients opined that doctor has pleasant body	97.9 %	775.154	<.001

| behavioural aspects (Shuchi) | language during the examination as well as in rounds, who treats them is more thorough in treatment aspect, doctor who treats him is patient and replies to all questions regarding the diseases | | | |

Table 4: Questionnaire findings on perceived quality of medication (n=527)

Sl.	Quality	Item	Patient agreement	X^2	P
1	Availability of medicine in abundance (Bahuta)	Patients gave opinion that the medicines prescribed to them could be consumed in various forms like Kashaya, churna etc	86.7%	500.277	<.001
2		Paitents said that doctor has changed form of medicine as per their request	56.6%	173.142	<.001
3		Patients opined that all the medicines are prescribed by the doctor are easily available in all the Ayurvedic medical shops.	46.2%	90.486	<.001
4	Medication having desired quality (Bahuguna)	Patients felt that prescribed medicines helped them in getting relieffrom almost all health problems	76.7%	81.074	<.001
5		Patients felt that patent medicines like capsules syrups etc. are more effective than classical medicines like Kashaya-churna etc.	36.9%	613.332	<.001
6		Patients have observed that they have not come across any ADR after consuming Ayurveda medicines during their stay in hospital.	93%	685.609	<.001
7	Medications having required potency/ effectiveness to cure the disease (Sampat)	Majority of patients have recorded that they have noticed date of manufacture and expiry date of Ayurveda medicines they are prescribed with	77.6%	375.989	<.001
8		Majority of patients have found that the prescribed Ayurveda medicines were effective on disorders from which they are suffering	78.9%	367.791	<.001
9	Prescription of suitable medications (Yogya)	Majority of patients have found relief after using medicine	88.4%	615.590	<.001
10		About medications maximum of patients have opined that they have been prescribed with medicines that are suitable for concerned disease	90.1%		<.001

Table 5: Questionnaire findings on perceived quality of service extended by medical attendant (n=527)

Sl	Quality	Item	Patient Agreement	X^2	P
1	Affectionate, involved towards patients (Anurakta)	Patients have opined that nursing attendants listen carefully to their complaints	90%	659.442	<.001
2		Patients have said that they are kind enough to describe physicians' instructions for them	89.7%	646.083	<.001
3		Patients have observed that nursing staff attending them are alwayspolite and affectionate	90%	623.844	<.001
4	Knowledge regarding disinfection, personal, social and behavioral hygiene (Shoucha)	Patients observed that dressing code of nursing staff are appropriate	94.1%	713.769	<.001
5		Patients have agreed that medicine preparation unit is neat and clean	72.7%	365.211	<.001
6	Skilfulness in nursing care according to type ailments and in assisting in all types of therapies(Dakshya)	Patients assess the knowledge of nursing staff about the preparation of diet and medicines	83.1%	588.854	<.001
7		Patients feel that nursing attendants were well trained	87.9%	651.207	<.001
8		Patients have agreed that skill fullness of nursing staffs to perform their duties	90.1%	724.300	<.001
9	Intelligent, expertness in the work (Buddiman) / effective care taking including preparation of diet, medicines and nursing (Upacharajnata)	Patients have said that nursing staff are having good relationship with them about treatment aspects	89%	668.664	<.001
10		have agreed that helpfulness of hospital workers during their stay in hospital	91.6%	763.446	<.001
11		Patients respondents have opined that nursing staffs are having proper mannerism	84.9%	787.526	<.001

Table 6: Questionnaire findings on self-assessment of patients (n=527)

Sl	Quality	Item	Patient Agreement	X^2	P
1	**Fearlessness (Abhirutva) / affordability (Adhya)**	Patients have agreed that they have the capacity of patients to bear the cost of treatment	73.9%.	306.065	<.001
2		Majority of have said that their illness is hampering the routine activity	80.2%	214.528	<.001
3		Patients could be able to explain about my difficulties to the doctor with hesitation/fear.	93.7%	648.417	<.001
4	**Obedience / treatment compliance (Nirdeshakaritva)**	Patients opined that they are obedient to doctor who is treating them	92.1%	652.535	<.001
5		Patients have disagreed that there is no need of following restriction advised by the doctor	51.8%	127.677	<.001
6		Patients have opined that they are highly compliant with prescribed treatment	88.2%	552.421	<.001
7	**Good memory for comprehensive communication (Smruti)**	Patient had good memory to explain in detail about the health related to physician	89.7%	568.285	<.001
8		Patients who remembered to taken medicine in-time	90%	292.991	<.001
9	**Ability to withstand (Sattvan)**	Patients opined that they could be able to withstand the disease,	93.5%	701.719	<.001
10		Patients said that they are following rules explained by doctor	96.4%	714.964	<.001
11		Patients felt that it is necessary to come for repeated follow up till disease is completely cured.	93.5%	646.046	<.001
12		Average score of all four Pada is	82.24%,	-	-

Analysis of scores of patient satisfaction on four components of therapeutics i.e. various qualities of physician **(Table 7)**, medicine / therapies **(Table 8)**, medical attendants **(Table 9)** and self assessment of patients as well as overall score are given **(Table 10)**. Analysis of patient satisfaction on four components of therapeutics:

Table 7: Results on scores of various qualities of physician

Parameter (Average score) (n=527)	Mean (□SD)	SEM	t	P
Dexterity (Daksha) (3 items)	13.23 (1.55)	0.07	29.39	<.001
Excellence in medical knowledge (Drusta Karma) (2 items)	8.79 (1.17)	0.05	25.37	<.001
Cleanliness (Shuchi) (2 items)	8.93 (1.14)	0.05	28.8	<.001
Extensive practical experience (Teerthatta Shastrartha) (2 items)	13.08 (1.63)	0.07	25.78	<.001

Test: one sample t test, SD – standard deviation, SEM- standard error of mean

Table 8: Results on scores of various qualities of medicines / therapies

Parameter (Average score) (n=527)	Mean□□SD)	SEM	T	P
Medication having desired quality (Bahuguna) (2 items)	7.36 (1.56)	0.068	-2.051	<.001
Availability of medicine in abundance(Bahuta) (3 items)	10.82 (2.13)	0.093	-4.61	<.001
Effective medication (Sampanna) (2 items)	8.40 (1.26)	0.05481	16.46	<.001
Suitable prescription Yogya (3 items)	12.24 (2.11)	0.09211	10.74	<.001

Test: one sample t test, SD – standard deviation, SEM- standard error of mean

Table 9: Results on scores of various qualities of medical attendant

Parameter (average score)(n=527)	Mean (□SD)	SEM	t	P
Affectionate (Anurakta) (3 items)	12.48 (2.11)	0.091	13.39	<.001
Intelligent, expertness in the work(Buddhiman) (3 items)	12.51 (1.76)	0.077	16.46	<.001
Skilfulness in nursing care(Daksha) (3 items)	12.27 (1.89)	0.082	12.44	<.001
Hygience (Shuchi) (2 items)	8.22 (1.26)	0.055	13.08	<.001

Test: one sample t test, SD – standard deviation, SEM- standard error of mean

Table 10: Results on scores related to self-assessment of patients

Parameter (average score)(n=527)	Mean (□SD)	SEM	t	P
Affordable & fearless (Adhya) (3 items)	11.91 (1.79)	0.08	8.493	<.001
treatment compliance (Bhishakvashya) (3 items)	11.73 (1.77)	0.08	6.219	<.001
Good remembrance(Jnapaka) (3 items)	12.95 (1.62)	0.07	24.01	<.001
Ability to withstand the disease (Satvavan) (2 items)	7.79 (1.56)	0.07	4.339	<.05

Test: one sample t test, SD – standard deviation, SEM- standard error of mean

Service rendered by physician has highest ranking with 88.06% score; followed by nursing service with 82.69% score. patient (self-assessment) stands in 3rd place with 80.69% and medication / treatment in 4th place with least score of 77.64%. (p<.001). Even the average percentage of agreement on individual pada also followed same order. Average sum score of 42 items is 172.72 out of maximum 210. Average score of all four components is 82.24%, which shows that the patients are satisfied **(Table 11, 12)**.

Table 11: Average scores of four components of therapeutics (n=527)

Parameter (Average score) (n=527)	Mean (□SD)	SEM	t	P
Physician quadruple (Vaidya) 10 items and maximum score 50 points)	44.03 (4.79)	0.21	31.32	<.001
Medicines / therapies (Dravya) (total 10 items and maximum score 50 points)	38.82 (5.35)	0.23	5.677	<.001
Medical attendant (Paricharaka (total 11 items and maximum score 55 points)	45.48 (6.05)	0.26	15.12	<.001
Patient self-assessment (Rogi) (total 11 items and maximum score 55 points)	44.38 (4.55)	0.20	14.55	<.001
Four quadruple (42 items)	172.72 (16.85)	0.73	20.74	<.001

DISCUSSION:

Physician: Patients have highest percent of agreement (94.27%) with score 44 out of maximum score of 50 (88.06%, p<.001) on physician component; the score stands in first place among four components of therapeutics. This may be because in teaching hospitals, expert Ayurveda doctors belonging to 14 specialties are available. Study shown that patients were satisfied with depth of knowledge of treating physician and this is supported by the study treatment by the doctor and medical care had high impact and ranking **[7]**.

Observation on perceived quality of physicians by patients about practical knowledge and thoroughness in treating the patient shown high degree of agreement. This is supported by the study as the information regarding treatment by doctor reported high-rate indicative of wide spread need for provision to adequate information to patients **[8]**.

Ayurveda physician were well appreciated by the patient in terms of mannerism, impressiveness and attracting nature. This is supported by the study that the doctors were accorded significantly high rating on friendliness and politeness **[9]**. A number

of studies have related physician nonverbal behaviours to patient outcomes, the most frequently studied being patient satisfaction. In this study, technical competence and quality of care are being assessed through patient's perception. These are reflected with high level of satisfaction of patients in nine Ayurvedic hospitals attached to medical colleges across Karnataka state.

Medicine / therapies: Ideally, medicines and dosage forms should be palatable, practicable to purchase or prepare or carry **[10]**. Parameters on Dravya pada shows moderate agreement (73.11%) and scored 38.22 out maximum 50 points (73.11 %, p<0.001) may be due to unpalatability of many forms of medicines such as decoction (Kashaya), powder (Churna) and other dosage forms. Prescriptions may be formulated according to need of the situation.

Medical attendant: Results shows that nursing staff of surveyed in Ayurvedic academic hospitals are technically sound and qualified, dressing code of nurses is satisfactory (average agreement of 82.69% and score of 45.48 out of maximum 50 points (87.55%, p<.001) and medicine preparation unit is neat and clean, technical competence of nursing staff executing the instruction given by physician and nursing staff are intelligent in executing the instructions, as well helpful nature and good mannerism of nursing staff with patients in nine Ayurvedic academic institutions. This is supported by literary findings related to nursing care and satisfaction. Risser first proposed a definition of patient satisfaction with nursing care, which was described as "the degree of congruency between a patient's expectations of ideal nursing care and his perception of the real nursing care he receives" defined patient satisfaction as patients' satisfaction with their nursing care and the degree to which they believed it was individualized and personalized **[11-12]**. Patients' perceptions of how their care was provided, excluding the outcome of their health status or the appropriateness of their therapy" **[13]**.

Table 12: Comparison of average score of four components and overall scores

Parameter (n=527)	Items	Maximum score	recorded score, %, p	Average % of Agreement	Remark
Physician	10	50	44.03, 88.06%, p<.001	94.27%	1st rank
Medical attendant	11	55	45.48, 82.69%, p<.001	87.55%	2nd rank
Patient self-assessment	11	55	44.38, 80.69%, p<.001	85.72%	3rd rank
Medicines / therapies	10	50	38.82, 77.64%, p<.001	73.11\%	4th rank
All four components	42	210	172.72, 82.24%, p<.001	85.16%	-

Patient self-assessment: Scores related to self-assessment showed 80.69% agreements on the questionnaire items and score of 44.38 out of maximum 55 (85.72%, $p<.001$). Patients do follow the instructions of physician but shows mixed reaction for some parameter because instruction regarding Pathya / Apathya are not properly conveyed to patients. While compliance also relates to an action on part of the patient, it is distinct to participation in that it is a passive response rather than a proactive involvement of the customer in the services context. Compliance has been described as the extent to which the patient follows their doctor's orders **[14]**. The examination of compliance is important as noncompliance results in billions of dollars being lost each year in health care costs **[15]** and has been linked to a number of societal problems, such as obesity and smoking. Patients were aware that the treatment and medicine will be on payment as major part of the survey was done in private academic hospitals, Patient self-assessment gives pointer towards the fact that patients are responsible towards their health conditions and consumption of medicine and active participation of patient during consultation and remembrance to take medication in time.

CONCLUSION:

In toto, among four components of therapeutics, physician is received has highest ranking; followed by medical attendant and patients self-assessment stands in 3rd place and medicines / therapies in 4th place ($p<0.001$). All four components together have scored 172.72 out of 210 points which shows that the patients are satisfied with the Ayurveda healthcare extended in teaching hospitals attached to nine Ayurveda medical colleges. The results reflect the acceptance of patients about Ayurveda system. High levels of satisfaction among the patients also indicate therapeutic quadruple (Chikitsa Chatushpada) approach is in practice in Ayurveda academic hospitals.

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