Does Quality of Healthcare Service Determine Patient Adherence? Evidence from the Primary Healthcare Sector in India

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Does Quality of Healthcare Service Determine Patient Adherence? Evidence from the Primary Healthcare Sector in India

NANDAKUMAR MEKOTH and VIDYA DALVI

Abstract. Patient adherence is extremely important to achieve positive outcome. While quality of healthcare service has been studied as a determinant of patient satisfaction and loyalty, its impact on patient adherence has not been examined. The authors attempt to determine dimensions of quality and their impact on patient adherence in primary healthcare in India. Exploratory factor analysis resulted into seven factors. Factor scores were used for regression to identify the influence of dimensions of service quality on patient adherence. Quality of healthcare emerged as a determinant of patient adherence.

Keywords: patient adherence, primary healthcare, quality of healthcare

Worldwide, the policy makers emphasize the need to reform primary healthcare to improve the health and welfare of the population. The main focus is on primary healthcare reforms because of increasing incidence of chronic diseases, aged population, expectations, economic implications, pressure on health systems (Australian Government 2009). As per the Alma Ata declaration of 1978, primary healthcare addresses the main health problems in the community, providing promotive, preventive and curative and rehabilitative services (World Health Organization 1978). In 2000, the global community made a commitment known as the Millennium Development Goals to eradicate extreme poverty and improve the health and welfare of the World's poorest population within 15 years (World Health Organization 2005). The World Health Organization (2008) report suggests four sets of primary health reforms: universal coverage reforms, service delivery reforms, leadership reforms, and public policy reforms for refocusing health systems toward health for all. Empirical research indicates that in the United States, United Kingdom, Australia, and Canada, patient-centered primary healthcare has gained tremendous momentum in healthcare sector. In America, the Triple Aim Outcome of better health, better care, and lower costs is being achieved because of the work done by the primary care patient-centered medical homes (Nielsen et al. 2012).

In 2005, the Government of India introduced the National Rural Health Mission to provide accessible, affordable, and quality healthcare services to the rural population, especially the vulnerable sections (Government of India 2011). The Minimum Needs Programme and Eleventh Five Year Plan of India emphasize wider and better coverage of primary healthcare for the majority of the population (Iyengar and Dholkia 2011). Rural population constitutes 68.84% to the total population of the country (Government of India 2011). A network of subcenters, primary health centers, and community health centers in the rural areas and hospitals

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and dispensaries in the urban areas provides health services to the community. There were 147,069 sub-centers, 23,673 primary health centers, and 4,535 community health centers functioning in India as of March 2010 (Government of India 2011). India provides an excellent example of medical pluralism. People follow home remedies, spiritual remedies and treatment from various medical systems (Kavitha 2012). People perceive free care as being of low quality, and therefore even the available infrastructure is grossly underutilized (Bajpai, Sachs, and Dholkia 2009). The treatment-seeking behavior of the urban poor (Barua and Pandav 2011) and rural poor is more inclined toward private health services (Iyengar and Dholkia 2011), and so-called quacks working in the vicinity of their residence for basic primary healthcare. This may be because the quality of healthcare services provided by the public health system is extremely low in terms of infrastructure, availability of drugs and equipments, regular presence of qualified medical personnel, and treatment of patients (Dalai 2005). For the majority of citizens, the public health system is unutilized due to distance, lack of money, lack of confidence in the system, or the availability of cheaper alternatives (Nundy 2005). "Healthcare is a rare service that people need but do not necessarily want" (Berry and Bendapudi 2007, 11). Rural poor have a tendency to postpone or avoid medical treatment as long as health-related problem is bearable. The soaring health costs and lack of accessibility to public healthcare facilities restrict the rural poor to avail the medical facilities. In low-income countries (i.e., India, Indonesia, Tanzania, and Paraguay), though accessibility is encouraging, whether the higher usage of health facilities translates into better health is a matter of debate (Das, Hammer, and Leonard 2008). Despite the difference of cost between private and public health service, the poor have a preference toward private health service (Iyengar and Dholkia 2011). Healthcare expenditure and loss of wages adds to the financial burden to the family. The study by Iyengar and Dholkia (2011) among below poverty line population in six states in India (i.e., Madhya Pradesh, Uttar Pradesh, Andhra Pradesh, Rajasthan, Karnataka, and Tamil Nadu) found that the poor households spent on an average about 14% of the household income on healthcare. Degree of access of any system varies according to direct out-of-pocket cost for medical care, waiting time, and general definition concerning conditions, which qualify the patient for treatment (Andersen

and Newman 2005). Effective, efficient and equitable people-centered primary health services will minimize social exclusion and avoid leaving people at the mercy of unregulated commercialized healthcare (World Health Organization 2008). The primary health delivery system should aim at fulfilling the patients' needs, wants, and expectations by focusing on cure, care, comfort, and convenience at affordable cost. Improvement of the access of the poor to the healthcare services requires quantitative as well as qualitative efforts otherwise the primary healthcare in rural areas is not likely to become effectively inclusive (Iyengar and Dholkia 2011).

Mere healthcare supply side's efforts are not enough to achieve the desired health goals; the support of patients' adherent behavior is needed as well. Patient nonadherence has become an alarming issue. The World Health Organization (2003) defined *adherence to long-term therapies* as "the extent to which a person's behavior taking medication, following a diet, and/or executing lifestyle changes, corresponds with agreed recommendations from a healthcare provider" (3).

This definition focuses on the patient's active role in decision making around management of his/her treatment. Adherence is about assessment of the goals/values underlying the decision (Lars et al. 2012). Lack of patient adherence to medication regimens, especially for the treatment of chronic conditions, leads to unnecessary disease progression, disease complications, reduced functional abilities, a lower quality of life, and even death (National Council on Patient Information and Education 2007). In developing countries, adherence to long-term therapies in the general population is around 50% and is much lower in developing countries (World Health Organization 2003). There are varying results of nonadherence across diseases. Acute and chronic diseases report high levels of nonadherence. A meta-analysis of 569 research studies indicated that the average nonadherence rate for medical treatment prescribed by the nonpsychiatrist physician is 24.8% (DiMatteo 2004). Diabetic patients reported a high rate of noncompliance in the Ai Hasa region of Saudi Arabia (Khan et al. 2012). Similarly, a study found adherence to medication in type 2 diabetes mellitus treatment at primary health clinics in Malaysia to be poor; 53% of the patients in the study population were nonadherent (Nur et al. 2013). A meta-analysis by DiMatteo (2004) found that the adherence is highest in HIV diseases, arthritis, gastrointestinal diseases, and cancer and lowest

in pulmonary diseases, diabetes and sleep. Empirical evidence shows that other than medical factors, socioeconomic, and patient demographic, psychological factors may influence adherence (DiMatteo 2004). Patients suffering from chronic diseases and multiple health problems may find it difficult to adhere to number of medications and long-term treatment. In Malaysia, in type 2 diabetes mellitus treatment, variables associated with nonadherence were age, medication knowledge and co morbidities and not the number of medications (Nur et al. 2013). The features of a disease, the referral process, the clinical setting, the therapeutic regimen, do not seem to influence adherence (Vermeire et al. 2001).

Adherence, a multifaceted problem requires a multifaceted approach (Bosworth, Duke University Medical Center, and the National Consumers League n.d.). Collaborative efforts by the policy makers, health professionals, insurers and pharmacists to improve the quality of primary healthcare service, may to a large extent enhance adherence. Quality in primary healthcare signifies: proper performance of interventions that are known to be safe, affordable, and have the ability to produce an impact on mortality, mobility, disability, and malnutrition (Roemer and Montoya-Aguilar 1988). A stronger managerial orientation should be introduced in the public health centers to help deliver quality service and patient satisfaction (Akter, Upal, and Hani 2008). Healthcare resource quality is indicated by the skills, knowledge, attitude, and behavior of the personnel; adequacy of equipments and supplies; and cleanliness and safety of the healthcare facilities (Das, Hammer, and Leonard 2008). Although physical status of servicescape correlates to satisfaction with facility, service ability impacted patient-perceived quality, and approach behavior (Lee 2011). Both medical and nonmedical aspects of primary healthcare can empower the patients with chronic diseases for self-care management and thereby influence the adherent behavior. Patients visit the healthcare facility with not only medical problem but with bundle of associated problems. Hence a combined biological, psychological, social, and economic perspective is crucial (Ravishankar and Chattre 2011). Patient segmentation and patient's personal health ecologies facilitates individual patient care in the context of culture, health status and health needs of the patients (Lega and Mengoni 2012). A patient-centric approach rather than disease-specific approach is more desirable in public primary healthcare system.

The customer of healthcare enters the healthcare facility in a state of either physical or psychological discomfort or both, which influences the patient perceived service quality (Duggirala, Rajendran, and Anantharaman 2008). The patient may not evaluate the clinical quality but may evaluate the process and structural quality. Shemwell and Yavas (1999) emphasized the need for extensive research into functional quality. The patients at primary healthcare centers perceive responsiveness, reliability, assurance, tangibles, health promotion, service standards, referrals, empathy, nonverbal communication, and technical competence as the important factors predicting patient enablement and satisfaction (Kebriel and Akabari 2006; Phaswana-Mafuya et al. 2011; Birhanu et al. 2011). Patient–doctor relationship and patient-centered care are the important factors influencing patient adherent behavior. The quality of the doctor–patient relationship is positively correlated with improved health outcomes (Cerimagic 2013). Continuity of care with one practitioner or one team results in better preventive care and better patient compliance with prescribed medication (Humphreys and Wakerman 2008). Spending quality time with the patient helps the doctor to understand the reasons for nonadherence at the individual level so as to motivate him or her for shared decision and to sort out the medical and nonmedical problems. In this regard, even the patient experience survey reports are of great help. The study relating to primary health centers in a tribal setting in Gujarat reported high level of satisfaction toward immunization services, and behavior of the doctor/health staff (Chandawani, Jivarajani, and Jivarajani 2009). Faith in the doctor is the motivating factor for the patients' visit to the government allopathic health facilities in Lucknow, India (Ranjeeta et al. 2009). Quality and responsiveness are key elements in increasing demand for services. During antituberculosis treatment, the patients' social and cultural reasons as well as operational determinants impacted on nonconforming patient behavior (Juvekar et al. 1995). Quality in healthcare must be based on appropriate technology (Nur et al. 2013) but nonuse of available equipments and technology can be a negative quality indicator and patient noncompliance (Vermeire et al. 2001).

Policy makers, medical professionals, and researchers agree that nonadherence is a serious issue. There are two persistent challenges: provision of wider, efficient, effective primary healthcare network and enhancing adherence. Past research work

on patient adherence largely highlights the impact of the medical and technological interventions on adherence and less on quality of primary healthcare service as a determinant of adherence. Hence a case for extensive research investigating the impact of health service quality of primary healthcare settings on patient adherence is strong.

MATERIALS AND METHODS

In India, a primary health center is the first contact point between village community and the medical officer. The primary health centers are established and maintained by state governments under the Minimum Needs Programme. A primary health center is managed by a medical officer along with nurses and paramedical staff. Primary health center activities involve curative, preventive, primitive, and family welfare services (Government of India 2011).

Information gathered from 218 outpatients of the primary health center in Karnataka, India, forms the primary data used to identify important quality parameters and the factors influencing the patient adherence behavior. This primary health center caters to the medical needs of nine villages having a population of around 10,000. A so-called quack, famous for his patient-centered care, also provides primary healthcare. The location of the primary health center is little away from the village residential area and not easily accessible by public transport. This primary health center lacked cleanliness in labor room and regular electricity supply. Doctor absenteeism and frequent transfers of the medical staff restrict their accessibility to the patients for continuity of care. The convenient sampling of 218 patients of primary health center was conducted from October 2012 to March 2013. The respondents with their oral consent were interviewed at their residences, at the Gram Sabha meetings and at the market places. The researcher used indirect method of measuring adherence (i.e., asking the patients about the adherent behavior). The preliminary questionnaire prepared in English was translated into the local language of Marathi. Part 1 of the questionnaire included the sociodemographic profile of the patients and the second part consisted of the statements relating to patients' perceived service quality, satisfaction and adherence. A 5-point Likert-type scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*) tested the level of satisfaction and adherence.

Data analysis was done using SPSS for Windows version 16.00. Frequency tabulations of de-mographic characteristics of the respondents were done in order to find out the nature of the sample and to ascertain variety among respondents. The characteristics considered included gender, age, income, education, occupation and type of illness. The summary is given in Table 1.

Thirty-two items were identified after checking for content validity to measure the service quality. Exploratory factor analysis with principal component analysis extraction and varimax rotation method was performed to identify dimensions of service quality. Three items with low communality were removed at this stage with 29 items remaining in the final quality scale. The summary is given in Table 2.

Further an ordinary least squares regression analysis with calculated factor scores representing dimensions of service quality as independent variables and the two dependent adherence variables follow-up of the treatment as per doctor's advice and change the health behavior as per doctor's advice has been performed to find out the influence of service quality on patient adherence.

Table 3 shows standardized coefficients and their significance of testing quality of medical service as a determinant of patient adherence variables, follow-up of the treatment as per doctor's advice, and change the health behavior as per doctor's advice.

RESULTS

The frequency tabulations provided in Table 1 indicate the sample had enough variety in terms of their characteristics. All of the 218 outpatients completed the questionnaires. A total of 46.3% of the outpatients were female. The age range of 20 years was considered because of different health-seeking behavior noticed across the different age groups. The respondents below 20 years were literate and more vocal. A majority of the ladies in the age group of 20–39 years sought primary healthcare service for prenatal health issues whereas gents for accidental cases. The respondents in the age groups 40–59 years and 60 years and above mostly suffered from chronic diseases such as diabetes, blood pressure problems, and arthritis. Some male respondents were treated for smoking and alcohol consumption. 22% of the respondents were illiterate. A total of 1.4% had no monthly income and 77% had monthly income of less than Rs. 5000; only 8.3% of the respondents engaged in job had a permanent source of income. These tabulations reveal some of the striking features of

TABLE 1. Characteristics of Sample

Category	Subcategory	n	%
Gender	Male	117	53.7
	Female	101	46.3
Occupation	Agriculture	71	32.6
	Job	18	8.3
	Business	21	9.6
	Housewife	55	25.2
	Unemployed	53	24.3
Age	Less than 20 years	26	11.9
	20–39 years	64	29.4
	40–59 years	83	38.1
	60 and above	45	20.6
Education	Primary level	100	45.9
	Secondary level	54	24.8
	Graduation	9	4.1
	Technical	7	3.2
	Illiterate	48	22.0
Income per month	Less than Rs. 5000	168	77.1
	Rs. 5001–10000	16	7.3
	Rs. 10001–15000	20	9.2
	Rs. 15001–20000	9	4.1
	Rs. 20001 and above	1	0.5
	No income	3	1.4
Health-related problems	Cold and fever	73	33.5
	Diarrhea	31	14.2
	Animal, insects, reptiles bites, and attacks	14	6.4
	Accidents	22	10.1
	Electrocutions	18	8.3
	Others (including prenatal cases)	60	27.5

the rural population of India. While gender and age groups were equitably represented in the sample, occupation is predominantly agriculture with equally high representation of housewives and unemployed. Also the tabulations reveal low level of education and income among the respondents. The excessive dependence on agriculture with high levels of unemployment coupled with low levels of education and income is a realistic portrayal of rural India.

Exploratory factor analysis resulted in grouping of 29 variables into seven dimensions of the service quality: interactive quality of the physicians, base-level expectations, nonmedical physical facilities, capacity and accessibility, nurse quality, transport and communication, and clinical outcome, which explain 68.131% of the total variance.

Variables pertaining to quality dimensions:

- Interactive quality of physician: understanding the patient's medical and nonmedical problems, communication in local language, suggesting appropriate referrals, counseling, and helpfulness and empathy.
- Base-level expectations: minimum medical care–related physical assets; physician's accessibility, capability, and reliability; and affordable care. This factor clearly spells out the base-level expectation from a primary health center as the first point of contact in case of any disease or emergency.
- Nonmedical physical facilities: patients also perceive certain basic nonmedical facilities such as dissemination of health education information, drinking water, and toilet in the primary health center as part of the quality of service.
- Capacity and accessibility: quality parameters such as nearness of the health center to the residential area, sufficient area, and number of beds.
- Nurse quality: very similar to physician's quality such as helpfulness, guidance, and provision of medicine; treatment with respect and dignity; and

TABLE 2. Scale Dimensions and Factor Loadings

	1	2	3	4	5	6	7
The doctor explains to the patient his/her physiological conditions and treatment	.888						
The doctor helps the patient to solve his/her health-related problems	.868						
The doctor understands the physiological conditions, counsels and treats	.832						
If need be, the doctor guides the patient with good referrals	.756						
The doctor is well educated and experienced	.668						
The doctor understands the local language	.548						
The doctor treats the patient with respect and dignity	.486						
There are minimum required clinical machineries and equipments at PHC		.797					
PHC is open on all the days		.697					
The doctor is capable of handling the medical emergencies		.623					
The price charged is reasonable		.576					
There is at least one doctor available at the PHC		.563					
The treatment at least gives some relief		.525					
There are provisions for drinking water and toilet facilities at PHC			.838				
Inside and outside area of the PHC is clean			.740				
There are charts and boards displaying the information on health			.694				
The PHC is near to the residential area of the village				.819			
PHC has sufficient place				.802			
The PHC is big enough to cater at least 50 people on daily basis				.661			
There is one PHC at each village				.611			
Nurses give proper medical treatment–related guidance to the patient					.747		
Nurses help the patient to solve his/her health-related problems					.729		
In doctor's absence' the nurses give correct medicine					.661		
Nurses treat the patient with respect and dignity					.650		
Nurses are well educated and experienced					.518		
There is a ambulance service						.750	
There is a provision for public telephone service at PHC						.730	
At least one nurse is available at PHC						−.596	
The treatment did not help							.805

Note. Extraction method was principal component analysis; rotation method was varimax with Kaiser normalization, and a rotation converged in 11 iterations.

the perception that the nurse is educated and experienced.

- Transport and communication: Provision of ambulance and telephone, respectively.
- Clinical outcome is the cure or control in case of acute illnesses and proper control in case of chronic illnesses, which do not have cure. In this study clinical outcome is measured as perceived by the patient.

The interactive quality of the physicians, base-level expectations, and nonmedical physical facilities were found to influence patient adherence. The first adherence dimension is the persistence of the treatment. This is the continuation of the medication adherence and other actions as per the doctor's advice. The second adherence dimension follows the treatment-supporting adherence, which involves a change in the health behavior as per the doctor's advice. The variance explained of the first dependent variable is 23.5% while the second dependent variable is explained to the extent of 18.5% only. It is interesting to note that the most important factor affecting patient adherence is base-level expectations followed by basic physical facilities and interactive quality of the doctor. Capacity and accessibility, nurse quality, transport and communication, and clinical outcome did not have any relation with patient adherence.

DISCUSSION

The factor structure indicates the perception of a primary health center as base facility meant for first contact where minor ailments could be treated and serious cases with some preliminary treatment could be referred to specialized health facilities. As such the exploratory stage of the research was successful in capturing these expectations, which further

TABLE 3. Regression Results

	Follow-up of the treatment as per doctor's advice		Change the health behavior as per doctor's advice	
	β	Significance	β	Significance
Constant		.000		.000
Interactive quality of physicians	.189	.002	.157	.013
Base-level expectation	.377	.000	.283	.000
Nonmedical physical facilities	−.197	.001	−.270	.000
Accessibility and capacity	−.063	.305	−.050	.427
Quality of nurses	−.020	.749	.045	.477
Transport and communication	−.077	.211	.047	.459
Clinical outcome	−.093	.128	−.025	.695
R^2	.235		.185	

analyses confirmed. Although healthcare delivery quality has emerged as a determinant of adherence, the psychosocial and economic context that influence adherent behavior cannot be ignored. Primary healthcare includes the provision of many services therefore assessing and assuring its quality is crucial. Patients look at primary health centre as a facility, which gives the first level of treatment in case of any emergency. They expect certain minimum facilities in the primary health center. Hence, as expected the most crucial basic factors have emerged as the determinants of adherence. While the doctor should be able to handle emergencies, much expertise is not expected from the doctor. The interaction with the doctor is found to have some impact on adherence but is secondary. Nursing quality, capacity, and accessibility were of no relevance in eliciting adherence. Even clinical outcome in the form of result did not matter. Clinical outcome did not predict adherence. This could be due to the fact that the disease groups, from which the patients were sampled, were chosen to reflect a variety of diseases, which requires medication as well as lifestyle modification and clinical outcome expectations varied across patients with disease characterized by symptoms. Clinical outcome is perceived by the patient either as informed by the doctor, or as indicated by the tests or as experienced by the relief of symptoms. Because symptoms are directly experienced by the patient, symptomatic relief will have a different impact from asymptomatic relief. Hence, the nature of disease as characterized by symptom could be proposed as a moderating variable, which regulates the relation between clinical outcome and adherence. An interaction effect of quality of healthcare by dis-

ease characteristics with symptoms may be more important than their individual contribution.

It was observed that more than 50% of the women do not fill the prescriptions because of lack of social support and financial problems. Poor adherence was reported even with free medication. The results also support earlier research findings that although not completely dissatisfied, the rural poor perceived the facilities and services of the primary health center to be deficient in some respect (Rameshan and Singh 2004). It draws attention to the fact that while the variance in follow-up with the doctor's advice is more explained by the quality of service, change in health behavior is less explained by quality.

CONCLUSIONS

This research confirms the expectation disconfirmation paradigm by restating that the quality is meeting the expectation of the customer. The expected quality of a primary health center is meeting certain base-level expectations, which are very well in tune with the intended use of the facility. As suggested by the World Health Organization 2008 report, this study supports that reforms in the health service delivery and public policy can strengthen these base features to meet the expectations of the rural public, which will positively impact patient adherence and individuals' well-being. Juxtaposing structural quality improvements with patient-centric process quality care should be an essential part of primary healthcare to enhance adherence and improve the satisfaction level of both provider and service recipient. Patient experience survey is an effective method of adherence measurement. Further research is required to study the

influence of patient-centered care on patient adherent behavior.

LIMITATIONS

Data collected were exclusive to this study and were from a relatively small number of respondents, which limited the generalization of the results to other primary health centers.

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