

# Healthcare Quality Management: A Study on Quality Awareness among Employees of Indian Hospitals

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**Abstract**— The empirical study has made an attempt to measure the effectiveness of employee awareness on quality management practices of selected Indian hospitals. Keeping this as an objective, the study measured the level of employee awareness on TQM practices, which may affect the quality performance of hospitals. The study was conducted among network hospitals accredited for Tamilnadu Government Employees New Health Insurance Scheme in India. Among 514 hospitals, 490 hospitals located in Tamilnadu were taken as population size and a sample of 245 hospitals were chosen for the study using systematic sampling method. The data were collected from top and middle level executives of network hospitals. The framework of the study adopted were descriptive statistics, exploratory factor analysis and one-way ANOVA. From the findings of the study it was observed that, larger share of the respondents' profile is from clinical and non-clinical departments and mostly heads of the departments represented for the survey. The study observed that the level of quality awareness among executives were moderate in nature. The study further observed that the level of quality awareness among executives were moderate in level. Furthermore, quality awareness was reduced to two factors through exploratory factor analysis. These identified factors were used for further investigation and found that respondents profile like designation, years of experience and the departments are associated with the awareness level of employees on the quality practices of the hospitals. Thus, the present study gave an idea on the level of quality awareness of the employees in hospitals which can be used to provide training on quality practices and other related policy making decisions towards enhancing the quality service of network hospitals.

**Keywords**— *Quality management, healthcare management, quality awareness, Indian Hospitals*

## 1. Introduction

In recent years, Total Quality Management has become a buzzword for quality output of any

organization irrespective of its final output. TQM has gained much importance over the past two decades as TQM is proven to provide long term benefits in all terms of an organization. In 1990's, TQM has emerged as a revolution in management and turned out into a major component of business operations towards achieving business excellence. In early 1970s, TQM was found to be predominantly applied in manufacturing sector and effectively improved production and reduced operating costs [1]. Later it was believed that TQM principles and practices are equally applicable to service sector as both the sector attempts to meet the customer requirements and organizational objectives. However, the adoption of TQM in the service sector is in budding stage and the prior researches implies that the studies are fewer when compared to those of manufacturing sector [2, 3]. In the prospective of developing nations like India, the literature survey suggests that there is necessity for more studies on TQM programme in the Indian sectors for better growth and prosperity of nation.

The healthcare and medical sector has entered an era of rapid innovation, ever challenging situation and intensified competition seeking more competency and creativity for successful existence [4]. Health care industry in India is one of the largest and most challenging sectors and possess a key to the nation's progress globally accounting for about 1.9 percent of country's GDP [5]. In India, the government policies have remarkably changed towards health care sector in which quality has been given an utmost care and concern. In connection to this, there is a need to enhance the quality of healthcare services. Several studies have been attempted to prove the impact of TQM on arriving at superior outcomes in healthcare organisation [6-8].

Several researches have been carried out on the implementation and effects of TQM in healthcare industry in different parts of the world. Majority of the studies on hospital industry are focused on service quality and patient satisfaction survey. Only limited numbers of studies are available in measuring relationship between TQM and quality performance hospitals. Hence, the present study attempts to examine the impact of TQM on the quality performance of network hospitals of Tamilnadu.

## 2. Literature Survey

Ref. [9] examined the impact of TQM implementation on tertiary-care public hospital to achieve highest total factor productivity growth in Sri Lanka for the 1997-2001 period. The study utilized Balanced score card approach to assess the performance of the hospital under study. Ref. [10] in their study examined the level of implementation of TQM constructs in Ibn Al Haytham Hospital in Jordan. Ref. [11] examined TQM as a potential source of sustainable competitive advantage, reviews of empirical evidence, and reports on TQM's performance consequences. Ref. [12] in their research decomposes the construct of quality management into two sub dimensions say quality practices and quality context. Ref. [13] described changes and results obtained after the practice of Quality Management Systems in a, Clinico Hospital, Madrid, Spain. Ref. [4] established the implementation of TQM and its relationship to operational flexibility have been limited, particularly in the developing countries. Ref. [14] attempted to understand the patient's perception on services of multispecialty hospitals and found factors influencing the same.

There is enormous amount of literature present on the emergence and application of TQM. Most of the studies on TQM are concerned on TQM practices, relationship development, model and framework development, and other issues. Much less has been written about the managers' quality awareness that affect the application of TQM in the industry. Most of them assumed TQM as a new management philosophy and requires special skill and work environment. Hence, in most of the situation TQM either failed or abandoned. Managers' quality awareness is a process of

updating the knowledge, developing skills, bringing attitudinal and behavioral changes, and improving the ability of the person to perform his/her task efficiently and effectively. It is the basic responsibility of the company to educate and train their managers in TQM so that TQM can be implemented successfully. Whether TQM is a new approach or a renowned approach for a company, it is essential that all participants must have knowledge and awareness of its principles, values, objectives, tools, techniques, and concepts for its implementation. Therefore, the need for quality awareness among managers has been emphasized by different quality experts as well as by quality practitioners [15, 16]. Quality awareness is an essential condition for gradual progression toward developing a TQM-based culture in an industry. The Study has identified the need for quality awareness and its impact on the quality performance of the hospitals [17]. From the literature support, it was found that there were many studies done on TQM with different perspectives. But in case of hospitals, the studies are limited in number. The present study attempted to examine the quality management of hospitals with special reference to "Quality awareness". There is no study with Quality awareness of network hospitals in Indian context. In Indian scenario, among the studies done in hospitals, majority of the studies are based on the context of TQM implementation, service quality, patients satisfaction, etc. In relevance to TQM, most of the studies are based on TQM implementation and Quality practices in hospitals. Only few studies focussed the on assessing the employee awareness which is an important tool for the performance of hospitals.

## 3. MATERIALS AND METHODS

The employee knowledge, understanding and behavior towards the policy of maintaining quality management in the network hospitals were considered for framing the construct "Quality Awareness". The variables were drafted based on literature support, which may enhance the validity of the study variables. The constructs were developed from [18-20] Based on the above literature review, a study has been proposed to examine the awareness of employees on quality management as a performance indicator in the Network hospitals in Tamilnadu.

### 3.1 Objectives

With respect to the proposed research, the objectives of the study are as follows;

1. To present the demographic profile of the executives of network hospitals
2. To measure the awareness level among the hospital executives upon TQM practices.
3. To explore the factors influencing Quality awareness in hospitals.
4. To identify the association between socio-economic variables and perception of executives on Quality awareness.

### 3.2 Research Methods

The current research uses a descriptive design. It deals with analysis of facts, condition, problem, views, and demographic information. Sampling frame of the study constitutes the list of network hospitals accredited for Tamilnadu Government Employees New Health Insurance Scheme published in the year 2016. The study also referred CIME regional report which provided name, contact address, person to contact, complete email address, telephone numbers etc. in which majority of the contact persons were top level managing personnel like CEO, Managing Directors, General Managers, Technical and Human Resource Managers etc. The list contains 514 hospitals out of which 490 hospitals are located in Tamilnadu. The study attempted to understand the impact of TQM practices in Tamilnadu region and hence those 490 were considered as the population size. The selected 490 hospitals covered almost all the popular hospitals of the state with respect to all locations of the state. As mentioned in the sampling frame, the population size is finite (N=490), the assumption of normal population was found to be poor [21] till 3 percent level of significance. Hence the study attempted to choose sample size at 5 percent level of significance wherein the ideal sample size (n) was determined to be 222 [22]. The study got a sample of 245 hospitals to meet out lesser error. The research instrument was given to 245 hospitals in the list in the ratio of five respondents per hospital to avoid the response bias within the hospitals and the respondents were chosen by simple random sampling approach by the method of random numbers. As mentioned above, for 490

hospitals, five respondents were planned to constitute the population size, which is 2450 respondents. According to the rule for determining the sample size provided by [22], for a population of size 2450, the desired sample size at 3 percent level of significance was determined to be 800. This sample was increased to 1225 (n) to reduce the probability of occurrence of type II error [23]. Thus, the sample size 1225 is quite above the minimum requirement and it was found to lie between the acceptable limit as per the research guidelines.

The study was carried out based on a self-administered structured instrument based on the nature of the service rendered in Indian hospitals. For the literature on TQM especially the study done by [18,21,25,26] provided the base for the construction of the research instrument. The framework of the study included, reliability analysis (Cronbach alpha), validity test (face validity, content validity and criterion validity), Exploratory Factor Analysis, and Onaway ANOVA.

## 4. RESULTS

### 4.1 Reliability and Validity Test

Reliability analysis is the most widely used technique to measure internal consistency among a group of items combined to form a single scale and reflects homogeneity scale in order to represent the factor. Using the SPSS 17.0, internal consistency analysis was performance for each of the TQM related constructs separately. The reliability coefficient value of the study variables is beyond the minimum acceptable level of 0.70, as per the prior research done by [27]. The reliability coefficient of the constructs ranges from 0.871 to 0.941 before and after pilot study, which shows that the scales developed and measured are highly reliable in nature.

**Table 1: Internal Consistency (Scale Reliability for Independent and Dependent Variables)**

Measure	Number of items before pilot study	Reliability coefficient before pilot study	Items deleted	Final number of items	Final reliability
Quality awareness	13	0.871	2	11	0.941
<b>n=1012</b>					

The majority of the items are developed based on prior research, which have already been subject to the test of reliability and validity. In addition to this, the content validity of the research instrument was also found to be good because of the sound literature support and thorough evaluation by subject experts and field practitioners. In order to be valid, the items of the instrument were modified, few were added and few were deleted based on the review of experts before

applying analytical tools.

#### 4.2 Descriptive statistics

The data analyzed can be explored by descriptive statistics, which will describe the nature of the data. In connection to the same, the various mean values, SD, variance, sleekness and kurtosis of the 11 statements related to the quality awareness perceived by the respondents of network hospitals.

**Table 2- Descriptive Statistics for quality awareness**

S.No	Statement	Mean	SD	Variance	Skewness	Kurtosis
1	Quality awareness concepts and practices in general.	3.52	0.620	0.384	-0.466	-0.018
2	Awareness on belief that TQM is a guiding principle for service operations	4.08	0.536	0.287	0.173	-1.136
3	Awareness about the TQM practices in different departments of the hospital	3.23	0.429	0.184	-0.147	-0.0784
4	The vision, Mission and quality policy are familiar among employees.	3.80	0.558	0.311	-0.029	-0.759
5	We are sure about the need of training for Implementation of TQM.	3.58	0.825	0.681	0.01	-0.704
6	Employees are aware that TQM paves way for quality service	3.82	0.615	0.378	0.036	-0.367
7	We believe TQM as a tool for continuous improvement.	3.31	0.630	0.397	-0.013	-0.06
8	Awareness on the process of internal and external auditing exists among all the employees	3.26	0.683	0.466	-0.126	-0.2
9	We are quite aware of the parameters for assessing the quality in their respective departments.	3.97	0.633	0.401	-0.112	-0.797
10	We are aware of terms like 'conformance to quality standards' and 'deviations from quality	3.54	0.768	0.590	-0.335	-0.171
11	Awareness on Preventive and Corrective action are high among the employees.	3.52	0.883	0.780	-0.026	-0.014

**Source :** Primary data

From the above table, the mean score of the statements about the level of awareness were presented. It was observed that statement 2(Awareness on belief that TQM is a guiding principle for service operations) is with highest mean score of about 4.08, followed by statement 9 (We are quite aware of the parameters for assessing the quality in their respective departments) with the mean value of 3.97. Statement 3 (Awareness about the TQM practices in different departments of the hospital) is with the least mean value of about 3.23. This shows that the respondents feel that TQM is a guiding principle in framing the service policies and procedures; also they are also aware of TQM practices followed in the other department. It was also understood that, the auditing though the employees are aware of TQM practices of other departments, they are not clear about the technical

parameter, which may vary from department to department.

The standard deviation (SD) ranges from 0.429 to 0.883 and the variances ranges from 0.184 to 0.780. Thus, the above table shows that the respondents from the Indian network hospitals possess a fair awareness with more than mean score of 3 inferring "moderate level" of awareness. Further, the SD is almost equal to 1 implies that, the data is widely dispersed in the distribution. The skewness and Kurtosis values are close to zero indicating that the data collected follow a normal distribution [20, 28].

### 4.3 Factor Analysis

For the current study, factor analysis is used to reduce the number of variables that are used to measure the perception of respondents on quality awareness. Respondents were asked to give their opinion on five point likert scale (1-very low to 5-very high) for 11 variables of “Quality awareness”.

#### 4.3.1 *Bartlett’s test of sphericity & Kaiser-Meyer-Olkin Test for Sampling Adequacy*

Bartlett’s test of sphericity is a test statistic used to examine the hypothesis that the variables are uncorrelated in the population. As shown in table 3, the significance value of Bartlett’s Test is 0.000, this leads to rejection of the idea that the correlation matrix is an identity matrix. The Kaiser-Meyer-Olkin (KMO) measure for sampling adequacy is an index used to examine the appropriateness of factor analysis. It compares the magnitudes of observed correlation coefficients to magnitude of partial correlation coefficients. The KMO value varies from 0 to 1. High value (between 0.5 and 1.0) indicates factor analysis is appropriate.

**Table 3 - Bartlett’s test of sphericity & Kaiser-Meyer-Olkin Test**

Kaiser-Meyer-Olkin (KMO) measure for sampling adequacy		0.884
Bartlett test of Sphericity	Approximate Chisquare	19545.68
	Sig. value	0.000*
*significant at zero level of significance		

### 4.3.2 Communality and Factor Loadings

Communality is the amount of variance a variable can explain with all the factors being considered. This is also the percentage of total variance explained by the common factors [29]. A low communality figure indicates that the variable is statistically independent and cannot be combined with other variables whereas Table 4 shows that the extracted Communalities are high (greater than 0.5), and hence, acceptable for all the factors formed in the present study. It is required that the maximum amount of variance should be explained in minimum number of components. Only those factors are extracted for which the Eigen values are greater than one. Thus, the factors extracted in the study are two in number and together contribute 74.06 percent of total variance. This is good percentage of variance to be explained for the appropriateness of the factor analysis. Thus extracting two factors from total 11 variables for measuring the quality awareness is effective by all means.

A careful observation of these extraction sums of squared loadings (without rotation) depicts that 74.06 percent variance is not uniformly distributed across all components and the first factor itself accounts for 43.46 percent of variance. Thus, for the variance to be uniformly distributed across all the components, a rotation of the components matrix is required. Only those factors are extracted for which the Eigen values are greater than one. Thus, the factors extracted in the study are two in number and together contribute 74.06 percent of total variance. This is a fair percentage of variance to be explained for the appropriateness of the factor analysis. Thus extracting two factors from total 11 variables for measuring the executive’s perception on quality awareness is good by all means.

**Table 4 – Communalities and Factor Loadings**

Statement	Factor Loading	Communalities	Eigen Values	Reliability	% of variance explained	Cumulative % of variance explained
Quality awareness concepts and practices in general.	0.754	0.785	4.033	0.925	43.46	33.46
Awareness on belief that TQM is a guiding principle for service operations.	0.752	0.858				
Awareness about the TQM practices in different departments of the hospital.	0.716	0.837				
The vision, Mission and quality policy are familiar among employees.	0.700	0.757				
We are sure about the need of training for Implementation of TQM.	0.674	0.911				
Employees are aware that TQM paves way for quality service	0.674	0.915	2.062	0.872	30.60	74.06
We believe TQM as a tool for continuous improvement.	0.714	0.815				
Awareness on the process of internal and external auditing exists among all the employees	0.583	0.898				
We are quite aware of the parameters for assessing the quality in their respective departments.	0.578	0.759				
We are aware of terms like 'conformance to quality standards' and 'deviations from quality	0.550	0.794				
Awareness on Preventive and Corrective action are high among the employees.	0.503	0.845				

**Source:** Primary data

The two factors extracted by factor analysis were identified based on the factor loading and the same were named based on the nature of commonality existing between the variables of the respective factor. This factor includes five items viz., Quality awareness concepts and practices in general, Awareness on belief that TQM is a guiding principle for service operations, Awareness about the TQM practices in different departments of the hospital, The vision, Mission and quality policy are familiar among employees, We are sure about the need of training for Implementation of TQM. In this factor, the awareness level on general features of TQM is assessed. Thus, the factor can be named as **“concept and characteristics of TQM”**.

This factor includes six variables viz., Employees are aware that TQM paves way for quality service, We believe TQM as a tool for continuous improvement, Awareness on the

process of internal and external auditing exists among all the employees, We are quite aware of the parameters for assessing the quality in their respective departments, We are aware of terms like 'conformance to quality standards' and 'deviations from quality and Awareness on Preventive and Corrective action are high among the employees. All these six items focuses on the outcome of TQM program. Hence, this factor was named as **“cause and effects of TQM”**

#### 4.3.2 Mean satisfaction score of extracted Factors

The factor wise score of the respondent's perception on awareness level of TQM program is derived by taking the grand mean of variables clubbed in each factor.

**Table 5- Grand Mean Score**

Factor	Factor name	Grand mean value
Factor 1	Concept and Characteristics	4.01
Factor 2	Cause and Effects	3.87

**Source :** Primary data

From the above table, it is found that the “Quality awareness” program can be measured through two factors among which the respondents are having a clear knowledge on concept and characteristics of TQM program with a grand mean value of 4.01, but the second factor cause and effects is also more or less close to the mean value of the first factor. This implies that the awareness level of the respondents of the hospital is quite comfortable about the principles of TQM and the merits and demerits of TQM implementation. This shows that, the hospital has provided proper ground knowledge and adequate training to the employees, which in turn make TQM implementation and its follow up actions easier. The least difference between the mean values of two factors may be due inter departmental variation in TQM ideology or parameters which may be negligible when the years of experience and designation/role moves to next level.

#### 4.4 Association between profile of employees and their view on Quality awareness factors

The 2 factors influencing the Quality awareness of the hospital were taken to test whether there is any influence of the profile of the respondents in perceiving the Quality awareness of the hospital. With this objective, the data were analyzed for testing the hypothesis that, **‘there is no significant difference in the perception of the respondents towards the “Quality awareness” of the hospital with respect to their demographic profile’** at 5 percent level using one way Analysis of Variance. The results thus obtained were given in the following table;

**Table 6 - Association between profile of employees and their view on Quality awareness factors**

S. No	Profile Variables	F Statistics	
		Concept and characteristics	Cause and effect
1	Gender	2.7137	2.9912
2	Designation/role	2.0446*	3.2735*
3	Years of experience	2.7156*	2.8154*
4	Department/section	2.0544	2.8217

\* Significant at Five percent level

The table shows the result of one-way analysis of variance. The Significantly associating profile variables with the employees view on the Quality awareness factor ‘concept and characteristics’ are, designation/role and years of experience since their respective ‘F’ Statistics are significant at five percent level. Regarding the second factor, ‘cause and effects’, similar to the previous factor, designation/role and years of experience are found to have significant association with the socio economic variable,

## 5. DISCUSSION

Top and middle level executives of the network hospitals were selected as respondents for the present study. Out of 245 hospitals choose for sampling frame with a ratio of 5 respondents per hospital, the study obtained 1012 fully filled questionnaires after segregating incomplete questionnaires and neglecting unanswered ones. The hospital industry is male dominated as of middle and top level is concerned. Almost 75 percent of the respondents are head of the departments of various clinical and non-clinical departments. Thus, the major representatives of the study were heads of clinical and non-clinical departments who are very much aware of process and procedures of hospitals they are associated with. The majority of the respondents must be well aware of quality policy and procedures and hence they would be able to meet out the queries easily. The core-operating department of hospital occupies the major share in the sample size, which implies that the research outcome can be well related to hospital industry.

From the mean score, it was observed that the level of awareness about TQM program in the network hospitals is moderately high and the respondents are very familiar with the procedures and practices of TQM program. Almost all the respondents of the hospitals are aware of impact of TQM on service operations. Among 11 statements, "Awareness about the TQM practices in different departments of the hospital". This may be because based on the nature of department, the quality practice may change which may not be known to employees of other departments. The respondent's awareness on quality program is in moderate level. However, the skewness and kurtosis values are close to zero that implies that the data are normally distributed. Hence, the data set can be used for further statistical investigation with various statistical tools for advanced analysis.

The factor analysis was employed to the 11 items that extracted two factors as a result of factor reduction method. The factor analysis was found appropriate for this variable 'quality awareness'. Further, Bartlett's test of sphericity was found to be 0.000 which inferred that the variables are uncorrelated i.e., the correlation matrix is not an identity matrix. The higher value of the communalities shows that items are acceptable for all the factors formed by factor analysis. 74.06 is comparatively good percentage of variance to be explained for the appropriateness of factor analysis.

The 'quality awareness' has generated two factors where factor 1 comprises of 5 items and factor 2 comprises of 6 items. Fortunately, all the factor loadings were above 0.55 and hence all the variables were considered for factor analysis. Based on the common nature of items in each factor, factors will be labelled for easy identification. Further, the grand mean of the factor 'concepts and characteristics' was determined as 4.01 and the same for 'cause and effects' was found to be 3.87. This shows that, the respondents of the hospital are having more awareness on 'concepts and characteristics' than that of 'cause and effects of TQM'.

As a result of factor analysis, it was observed that quality awareness can be considered in two categories as awareness on concepts and characteristics of TQM and awareness on cause and effects of TQM.

It was observed that there exists a significant difference in perception of 'quality awareness' with respect to designation and years of experience. The gender and department did not make any difference in perception of Quality awareness. This shows that both male and female respondents are looking at 'quality awareness' in same way without any gender disparity. Similarly, the department does not make any difference in the perception of 'quality awareness' as TQM is usually an overall approach, all the respondents perceive it equally without any difference with respect to different departments of the hospitals. Whereas, the designation and number of years of service has an association with the perception of quality awareness. This may be due to the roles they play in their job description and the time duration with the hospital, which may have played a role in educating about quality awareness in them.

### 5.5 Managerial implications

From the present study, it was observed that the employee's awareness on quality statements are moderate with considerable amount of variation. This shows that, amidst of having a considerable amount of experience in the hospital, no employee can go quality unnoticed. Improving the awareness level of employees will support the hospital to reach its excellence. Periodic training on quality management, assessment on uniform intervals, and discussion on quality management practices will help the employees to do their work in a better way. Moreover, instead of simply reading out the quality manuals, employees should know the basics of TQM, its cause and effects for a better understanding. This can be achieved with framing job specific quality awareness, departmental quality objectives and conducting frequent training and quality inspection with respect to different areas of hospital management.

### 6. CONCLUSION

The present study was carried out to measure the quality awareness of employees working in selected network hospitals. It was observed that quality awareness can be studied based on two factors, one being "concepts and characteristics of TQM" and the other being "cause and effects of TQM". Thus in order to study the awareness level,



it is sufficient to deal these two factors. These factors could be designed to meet the requirements of quality awareness with respect to the nature of service rendered in hospitals. Hence the study contributed in identifying the general areas for enhancing the overall quality eco-system in hospital industry by identifying the broad areas of awareness. Further the study gave outputs on the impact of demographic profile of the employees on quality awareness which would be helpful in meeting the training needs to the employees with respect to different demographic profiles. In addition to this, the contribution of the present study can also be highlighted with its social relevance by identifying factors for enhancing the quality of service through creating an awareness on the needs of quality practices in the hospitals. The study can indirectly be used to identify service gaps and reduce waiting time at all service points of hospitals like patient wards, labs and pharmacy, cash counter etc., which in turn will enable the patients to be stress free inside the hospital. It was believed that quality awareness lays foundation for successful implementation of quality practices for desired performance of any entity. Thus, the present study concludes that, measuring quality awareness would be a positive moderator for quality performance of the hospital, which in turn may increase the overall efficiency of the hospital positively in terms of service cost and economies of scale. The enhanced performance of hospitals will definitely reduce fatal accidents that happen inside the hospital increasing the satisfaction of the patients and good will of the hospital.

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