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# Measuring the Quality of Healthcare Services in Bangladesh

Fahima Khanam, European University of Bangladesh, Dhaka, Bangladesh
Nayem Rahman, Portland State University, Portland, USA

## ABSTRACT

Quality is a universal word not only for the products but also for the services too. Measuring the quality of service in hospitals and healthcare centers is more difficult than the measurement of product quality. In Bangladesh, healthcare services vary a lot between government-owned hospitals and private hospitals in Dhaka city. This research is constructed to measure the quality of services delivered to the patients by Dhaka Medical College (DMC) hospital and Square hospital. The study shows a handful of comparisons regarding the effects of services quality of DMC and Square hospital on patients' perceptions and expectations as well. A structured questionnaire was used for collecting the data using a survey and a 5-point Likert scale. Data were analyzed using statistical tools such as multiple regression analysis. This paper shows a significant correlation between the five dimensions (tangibility, reliability, responsiveness, assurance, and empathy). The other objective of this research was to find out the differences between public and private hospitals' services quality in the healthcare sector by determining the quality of the service of DMC (public hospital) and Square Hospital (private hospital)

## 1. INTRODUCTION

Health care is one of the basic rights of human being. Ensuring the quality of health care services is mandatory for getting a developed nation. Bangladesh is one of the densely populated countries having the problem of poverty. A major portion of the population does not have the ability to afford the rising costs of health care in private hospitals. On the other hand, public healthcare service quality is questionable. The government of Bangladesh is giving much priority in ensuring better health care services for the people of all classes. The constitution of Bangladesh, Article 15(a) and Article 18(1), has given top priority to public health and nutrition as state policy of the government of the People's Republic of Bangladesh. To execute the obligation of the constitution and expectation of the people, the governments of Bangladesh has taken measures to prepare a pragmatic health policy for the nation. Accordingly, there were attempts to formulate an acceptable health policy in 1990, 2000, and 2006 to ensure quality medical care and services to citizens (Daily Star, 2008). For betterment in health care, the greater involvement of private sectors is more important In recent years the World Bank and other donor agencies have been advising developing countries to ensure that limited resources not only have an optimal impact on the population's health at affordable cost but also that health care services are expected to respond directly to patients' preferences and demands (Geyndt, 1995; Calnan et al., 1994; and Calnan, 1988).

Various research and public opinion have called for improving the quality of healthcare delivery system (Aldana et al., 2001). While the efforts are being made in the right direction, the public health sector is plagued by uneven demand and perceptions of poor quality and the quality perception is driving patients to private healthcare sector (Andaleeb, 2001). This poor service quality is the pivotal cause responsible for declining utilization rate of public health care facility in Bangladesh and this poor

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condition of public health care is aggravating the rights of getting proper health care of the population. Dissatisfaction with public health care sector is shifting demand toward private health care sector.

The trend of utilization of public health care services in Bangladesh had been declining between 1999 and 2003, while the rate of utilization of private health care facilities for the same period had been increasing (Cockcroft, Milne, & Andersson, 2003). But the higher cost of the services provided by the private sector is almost impossible to afford for the majority people of the poor country like Bangladesh. According to Barkat and Maksud (2003), poor utilization of facilities, cost-effectiveness, quality of services etc. are the major obstacles for the healthcare industry of Bangladesh. So, in order to fill these gaps, today the national healthcare system is significantly influenced by the private healthcare sector, even though access to private facilities is limited to certain beneficiaries of medical schemes (Bisschoff and Clapton, 2014). It provides services to people who can afford and is ready to pay for them (Rahman. 2014). The industry offers modern allopathic medicine, provided by highly qualified doctors working in relatively formal settings in government facilities, private premises or in both. Private settings in Bangladesh include private hospitals and clinics.

But in recent years, some failure and services quality-related death incidents have given reason to the service quality of the private sector to doubt. The private health care sector (including unqualified providers) deserves close scrutiny as about 70% of the patients seek medical care from this sector (World Bank, 2003). Between 1996 and 2000, private hospitals grew around 15% per annum. Massive investments in the private sector are boosting growth. In 2005, Apollo hospital alone has invested $35 million (Apollo Hospital, 2017). Similar investments have been made by other major corporate groups. At the same time, a large number of Bangladeshi patients are nowadays affording the service of foreign hospitals. Institute of Health Economics, University of Dhaka, estimates that Bangladeshis spend approximately $300 million a year to receive healthcare services from foreign countries (World Bank, 2003). According to the aforementioned information, it is necessary to determine the service quality of both private and public health care sectors so that possible rectification can be taken. This research makes an attempt to better understand the service quality of a public hospital named Dhaka medical college and a private hospital named Square Hospital as well as portraits a comparative picture of their overall service quality.

In an underdeveloped country like Bangladesh, most of the citizens are dependent on public hospitals for medical treatment. In contrast, there are many private hospitals which are very expensive to afford for the low-paid people. There is always a controversy that private hospitals are better than public ones in terms of treatment and other facilities. Most of the people think that public hospitals don't take care of their patients, whereas, private hospitals charge higher prices compared to their services. So, finding out people's true perceptions of service quality of private and public hospitals of Bangladesh can be a reliable image of these hospitals. However, many studies on this case have been conducted before. But any study on the service quality of any specific hospital has been rarely found. Neither any study had been conducted by comparing the service quality of a public and a private hospital so far. From patients' end, it may have great implication for them to know the real scenario of the service quality of both private and public hospitals. So, this is the real problem that works as fuel for this study.

The highly competitive market in the public and private hospital industry has caused increasing pressure on hospitals to provide services with higher quality. The aim of this study was to determine the effect of the five dimensions of the service quality on the basis of SERVQUAL model in the public and private hospitals of Dhaka and evaluating the service quality from the patients' perspective. The SERVQUAL is a research instrument which is widely used by researcher and practitioners for the last three decades (Miller et al., 2011; van Dyke et al., 1997; Asubonteng et al., 1996).

The study sample 100 was composed of patients who were selected by a simple random technique from a public hospital named Dhaka medical college hospital and a private hospital named Square Hospital. The study questionnaire was the SERVQUAL questionnaire, consisting of 16 items in service quality dimensions.

This study attempts to find out whether the service dimension has any impact on the patients' satisfaction (service quality) and sort out the basis of patients' satisfaction on service quality and give the insight of both hospitals where improvement is essential to give more customer/patient-oriented service.

The broad objective of the study is to find out the quality of service provided by the DMC hospital and Square hospital. The specific objectives are:

1. To determine the impact of service quality on the hospital delivered to the patients.
2. To study patients' satisfaction toward the quality of service offered in public hospital (DMC hospital) and private hospital (Square hospital).
3. To find out the relationship between service quality and the five dimensions of service.
4. To identify the variables that can make the quality of service better.

## 2. LITERATURE REVIEW

Currently, the role of service quality is widely recognized as being a critical determinant for the success and survival of an organization in a competitive environment. One of the fastest growing industries in the service sector is the healthcare industry. The success of private hospitals depends on patients 'perceptions or judgment on the quality of products/services provides by service personnel in hospitals and service quality is the measure of how well the services delivered meet patients 'expectations. Parasuraman et al., (1985) presented a view of service quality in terms of differences between customer expectation and perceived services.

In order to offer services that achieve patients' satisfaction, it is required to identify patients' needs and expectation as well as assigning priorities (Parasuraman et al., 1985, 1988). Originally the SERVQUAL instrument consists of sixteen items with Likert scale. The items were developed against five service quality dimensions as below:

1. **Tangibles:** Refers to the appearance of physical facilities, personnel, and equipment.
2. **Reliability:** Refers to the ability to offer the services as promised by healthcare dependably and accurately.
3. **Responsiveness:** Refers to willingness for helping the patients by providing prompt service.
4. **Assurance:** Refers to possession of knowledge, courtesy was shown by staff and their role in building trust and confidence with customers, and
5. **Empathy:** Refers to the care and attention given to customers.

These five dimensions are used in two different ways; First, it is used to measures the expectations of customers. Then the same statements used to measure the perceived level of service offered by the organization. The sixteen items are designed in terms of five service quality dimensions. Likert scale is used to measure (Strongly agree to strongly disagree) (Parasuraman et al., 1985, 1988). Furthermore, when expectations are met, it results in satisfaction. Whereas when expectations are not met by healthcare, it results in dissatisfaction. In addition to that, once the data is acquired, the gap score is calculated by subtracting it from expectation score. When the gap score is positive, it means that expectations have met or exceeded, whereas the negative score reflects dissatisfaction. Gap score can be calculated individually and then aggregated to find out the overall gap score of each dimension.

In healthcare, variety of studies adopted the SERVQUAL model to assess various healthcare related services, such as (Bowers et al., 1994) acute services offered by healthcare (McAlexander et al., 1994); services offered by AIDS-related institutes; (Fusilier and Simpson, 1995); services offered at state-owned universities; (Anderson, 1995) study on physicians services offered to patients; (Taner and Antony, 2006) study on healthcare services; Furthermore, Buttle (1994) presents the

advantages of the SERVQUAL model. These are as follow: (i) SERVQUAL is a standard tool for assessing service quality; (ii) The model reveals valid results for many studies; (iii) The model is known for its reliability; (iv) The model is user friendly, customers can easily and quickly fill the instrument; and (v) Easy to analyze and interpret. Service quality needs to focus on customers 'needs as each customer has its own needs in comparison from a management point of view. Furthermore, Parasuraman, Zeithaml, and Berry (1991) suggested that service quality is an external perception that is based on customers' expectations.

Presently, 73% of children are fully immunized in Bangladesh and the child mortality rate has declined substantially to 34.2 per 1000 from 143.8 in the 1991 (UNICEF Data, 2016). Maternal mortality, an important indicator of well-being, has also declined, to 3.2 per 1000 in 2001 from 6 per 1000 in the 1980s, with the introduction of appropriate preventive measures. The private health care sector (including unqualified providers) also deserves close scrutiny as about 70% of the patients seek medical care from this sector (World Bank, 2003). Between 1996 and 2000, private hospitals grew around 15% per annum. Unfortunately, there are concerns that the quality of service is being ignored here as well.

Some of its main drawbacks include disregard of standard treatment protocols, lack of qualified nurses and unnecessary diagnostic tests (World Bank 2003). We believe this link is important also in the health care sector in Bangladesh. Earlier studies suggest that service quality can be adequately measured using the SERVQUAL framework (Parasuraman *et al*. 1991, 1993), and its refined version in the context of Bangladesh (Andaleeb, 2001), to help explain patient satisfaction. It has also been shown that dissatisfied customers tend to complain to the establishment or seek redress from it more often to relieve cognitive dissonance and failed consumption experiences.

Recent research has shown that service satisfaction can significantly enhance patients' quality of life and enable service providers to determine specific problems of customers, on which corrective action can then be taken. Patients' voice ought to derive similar changes in developing countries. Customer satisfaction is also a valuable competitive tool (Khanam, 2018). Hospitals that are customer focused have been able to increase capacity utilization and market share.

The scope of this study consists of the Patients' of the DMC hospital and Square hospital are whether satisfied or not is measured by this study and the effect of service quality differences between public and private hospital is determined. This study is confined to only the samples taken from people residing in Dhaka, Bangladesh.

## 3. CONCEPTUAL FRAMEWORK

Based on the above-mentioned studies conducted previously, five types of very important factors can be identified. These factors are tangibles, reliability, responsiveness, assurance, and empathy. Each factor has some distinct variables. Tangibility includes modern equipment, physical facilities, and the environment. Reliability includes interest to solve, perform the first time and keep records. Responsiveness includes prompt service, willing to help and respond quickly. Assurance includes instill confidence, politeness and answering questions. Empathy includes individual attention, personal service, and attention. How these variables influence service quality is the topic of this study. So, these factors containing the above-mentioned variables act as independent variables and service quality act as the dependent variable. On the basis of these factors, a research framework is developed (Figure 1). Based on this framework, the hypotheses are developed (Table 1).

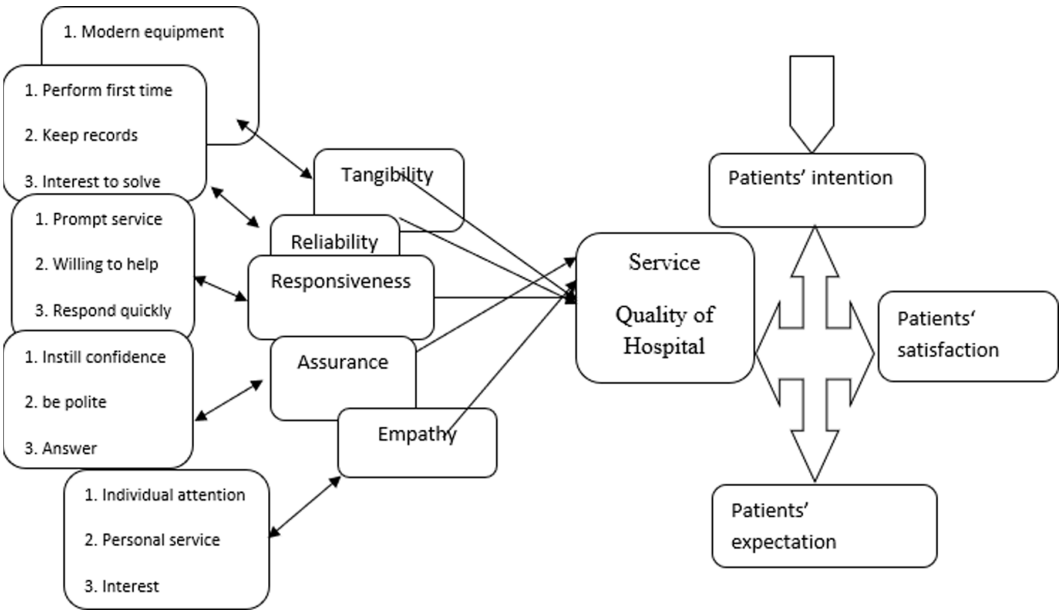
## 4. RESEARCH METHODOLOGY

Both primary and secondary data were used to conduct the study. Secondary data were collected from other research papers of journals regarding the service quality of the hospital on the basis of the SERVQUAL model, different books, papers, manuals, website etc. related to the topic. Primary

**Table 1. The hypotheses**

| DMC hospital | Square hospital |
|---|---|
| RQ1: Do the five dimensions of service influence the service quality of DMC hospital. | RQ1: Do the five dimensions of service influence the service quality of Square hospital. |
| H1: Tangibility affects the service quality of DMC hospital. | H1: Tangibility affects the service quality of Square hospital. |
| H2: Reliability affects the service quality of DMC hospital. | H2: Reliability affects the service quality of Square hospital. |
| H3: Responsiveness affects the service quality of DMC hospital. | H3: Responsiveness affects the service quality of Square hospital. |
| H4: Assurance affects the service quality of DMC hospital. | H4: Assurance affects the service quality of Square hospital. |
| H5: Empathy affects the service quality of DMC hospital. | H5: Empathy affects the service quality of Square hospital. |

**Figure 1. The research framework**




data were collected from the respondents who received service from DMC and Square Hospital. The target population of this study was the customers who received service from these two hospitals. The number of people is uncountable for that reason.

The sample size for this study was determined as 100. Non-probability sampling technique was used to select the samples. The reasons for selecting a non-probability sampling technique are 1) the variability in the population is low, 2) population size is undefined, 3) time and cost issues are available. Among the non-probability sampling techniques, convenience sampling was used. The sampling frame includes the customers who received healthcare service from Dhaka Medical and Square Hospital at least once. The data collection method was surveyed using a questionnaire as the instrument. The questionnaire consisted of statements representing independent and dependent variables.

A structured questionnaire was mainly used for collecting the data. The questionnaire also included formal, non-forced, balanced itemized questions. The study questionnaire was composed of 2 parts: the first part included 5 questions relating to the demographic data of the patients. In the second part, the SERVQUAL questionnaire with some modifications that is suitable for hospital environment was used for assessing the patients' expectations and perceptions of service quality for both DMC and Square hospital. The questionnaire included 16 items in five service dimensions: tangibility, (3), reliability (3), responsiveness (3), assurance (3), empathy (3), and service quality (1).

A 5-point Likert scale was used that ranged from 1 to 5 in which "1" denotes "strongly disagree", "2" denotes "disagree", "3" denotes "neutral", "4" denotes "agree" and "5" denotes "strongly agree". Interval scales were used to measure the service quality of DMC and Square hospitals. The nature of the data is metric. For analysis, Multiple Linear Regression Model was used to measure the service quality of Dhaka Medical and Square Hospital, for performing regression model, SPSS version 16 software was used.

## 5. RESEARCH FINDINGS, ANALYSIS AND LIMITATIONS

Data analysis for Square hospital:

### Interpretation

According to the model summary (Table 2), researchers have tried to identify the association between service quality of Square hospital and five dimensions of SERVEQUAL model. R square represents the strength of association between the dependent variable and independent variables. When the value of R square exceeds .5 then it suggests a moderate association between dependent variables and independent variables. From the above table (Table 2), we can see that the value of R is .725 which indicates that there is a strong association between service quality dimensions and service quality of Square hospital. From the aforementioned Table 2, it can be observed that the value of R square is .525 which means that dependent variable is strongly associated with independent variables 52.5% of the variance in the dependent variable is explained by independent variables. Here, the value of the adjusted R square is .316. As there is a big difference between R square and adjusted R square, there are more opportunities to add more variables.

Table 3 shows that the significance value is 0.013 which is below 0.05 and the value of the F ratio is 2.509 which are significant at 5% level. So, independent variables influence the dependent variable.

Using the values from the given coefficients (Table 4), the regression model is as following: service quality of Square hospital (The five dimensions of service influence the Square hospital service quality) = 1.400 -.312 (TAN1) +.273 (TAN 2) +.142(TAN 3) -.038(REL 1) + .021 (REL 2) -.129 (REL 3) + .319 (RSP 1) + .106 (RSP 2) +.417 (RSP 3) -.209 (ASR 1) -.277 (ASR 2) -.377(ASR 3)+.426(EMP1)-.071(EMP2)+.361(EMP3).

**Table 2. Model summary**

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate |
|---|---|---|---|---|
| 1 | .725 | .525 | .316 | .60822 |

***Predictors***: (Constant), Square Hospital has their patients' best interest at heart, Employees are polite with patients., Doctors And Employees are never too busy to respond to patients requests., Square Hospital keeps their records accurately, When a patient has a problem, they show a sincere interest in solving it., Square Hospital's employees give patients individual attention., Physical facilities (like machines, beds) are well functioning, Employees are always willing to help patients, The behavior of employees can instill confidence in patients, The physical environment of Square hospital is clean., Employees give patients personal service., Doctor and Employees give prompt service to patients, Employees of Square hospital have the knowledge to answer patients' questions., Square Hospital performs the service right the first time, Square Hospital has modern equipment. In terms of the dependent variable, the service quality of Square hospital is good.

**Table 3. Dependent variable - service quality of DMC hospital is good**

| Model | | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| 1 | Regression | 13.922 | 15 | .928 | 2.509 | .013 |
| | Residual | 12.578 | 34 | .370 | | |
| | Total | 26.500 | 49 | | | |

**Table 4. Coefficients table**

| Model | Unstandardized coefficients | Unstandardized coefficients | Standardized coefficients | t | Sig. | Collinearity statistics | Collinearity statistics |
|---|---|---|---|---|---|---|---|
| | B | Std. Error | Beta | | | Tolerance | VIF |
| Constant | 1.400 | .683 | | 2.050 | .048 | | |
| TAN1 | -.326 | .165 | -.312 | -1.969 | .057 | .557 | 1.796 |
| TAN2 | .230 | .114 | .273 | 2.016 | .052 | .762 | 1.313 |
| TAN3 | .098 | .094 | .142 | 1.042 | .305 | .754 | 1.326 |
| REL1 | -.031 | .114 | -.038 | -.267 | .791 | .696 | 1.437 |
| REL2 | .015 | .114 | .021 | .135 | .893 | .583 | 1.715 |
| REL3 | -.096 | .108 | -.129 | -.886 | .382 | .659 | 1.517 |
| RSP1 | .237 | .106 | .319 | 2.235 | .032 | .684 | 1.462 |
| RSP2 | .084 | .120 | .106 | .703 | .487 | .618 | 1.617 |
| RSP3 | .333 | .100 | .477 | 3.313 | .002 | .675 | 1.482 |
| ASR1 | -.161 | .116 | -.209 | -1.387 | .175 | .617 | 1.622 |
| ASR2 | -.238 | .118 | -.277 | -2.013 | .052 | .737 | 1.357 |
| ASR3 | -.311 | .125 | -.377 | -2.481 | .018 | .606 | 1.651 |
| EMP1 | .303 | .100 | .426 | 3.036 | .005 | .710 | 1.409 |
| EMP2 | -.047 | .091 | -.071 | -.514 | .610 | .731 | 1.367 |
| EMP3 | .294 | .131 | .361 | 2.252 | .031 | .542 | 1.844 |
| | | | | | | | |

Standardized coefficients calculated for each predictor variables, showing the percentage of variation in the dependent variable caused by the individual independent variables. It can be revealed that the physical environment of Square hospital is clean (TAN3), doctors and employees are never too busy to respond to patients' request (RSP3), the behavior of employees instill confidence the patients' (ASR1), Square Hospital has their patients best interest at heart (EMP3), Square Hospital's employees give patients individual attention. (EMP1) is significant at 5% level. The Standardized beta coefficient TAN3 is .142 which means Square hospital's physical environment is an important variable that affects the service quality. The second important variable is that doctors and employees are never too busy to respond patients' request and Standardized coefficient of RSP1 is .417. The third most important variable is Square Hospital has their patients' best interest at heart and its standardized coefficient is .361.

From the above correlation matrix (Table 5), we can see that there are very few values which are more than 0.5. We know that if the maximum values of the correlation matrix exceed 0.5, then we

**Table 5. Correlations table**

| | SQ 1 | TAN 1 | TAN 2 | TAN 3 | REL 1 | REL 2 | REL 3 | RSP 1 | RSP 2 | RSP 3 | ASR 1 | ASR 2 | ASR 3 | EMP 1 | EMP 2 | EMP 3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SQ 1 | 1.00 | -.063 | .006 | .138 | .082 | -.003 | -.259 | .219 | .069 | .161 | .122 | -.120 | -.087 | .325 | -.151 | .307 |
| TAN 1 | -.063 | 1.00 | .145 | .289 | .037 | .015 | .271 | -.005 | .083 | .162 | -.105 | .056 | .356 | .277 | -.168 | .327 |
| TAN 2 | .006 | .145 | 1.00 | -.138 | -.034 | .092 | .036 | -.158 | .094 | -.061 | .046 | .266 | -.024 | .051 | .125 | -.192 |
| TAN 3 | .138 | .289 | -.138 | 1.00 | -.004 | .029 | .281 | .052 | .140 | .095 | .143 | -.139 | .277 | .245 | -.025 | .199 |
| REL 1 | .082 | .037 | -.034 | -.004 | 1.00 | -.196 | -.065 | .225 | .068 | .063 | .195 | -.005 | .113 | .129 | .306 | .213 |
| REL 2 | -.003 | .015 | .092 | .029 | -.196 | 1.00 | -.173 | .087 | .475 | -.209 | -.146 | .251 | .013 | .004 | -.124 | -.063 |
| REL 3 | -.259 | .271 | .036 | .282 | -.065 | -.173 | 1.00 | -.023 | -.012 | .042 | .063 | -.109 | .295 | .103 | .123 | -.128 |
| RSP 1 | .219 | -.005 | -.158 | .052 | .225 | .087 | -.023 | 1.00 | .060 | -.341 | .145 | .161 | -.034 | .091 | -.088 | .306 |
| RSP 2 | .069 | .083 | .094 | .140 | .068 | .475 | -.012 | .060 | 1.00 | -.183 | .235 | .227 | .048 | .219 | -.009 | .108 |
| RSP 3 | .161 | .162 | -.061 | .095 | .053 | -.209 | .042 | -.341 | -.183 | 1.00 | -.040 | -.085 | .318 | -.048 | .055 | -.026 |
| ASR 1 | .122 | -.105 | .046 | .143 | .195 | -.146 | .063 | .145 | .235 | -.040 | 1.00 | .053 | -.008 | .332 | .080 | .299 |
| ASR 2 | -.120 | .056 | .266 | -.139 | -.005 | .251 | -.109 | .161 | .277 | -.085 | .053 | 1.00 | -.243 | -.017 | .012 | -016 |
| ASR 3 | -.087 | .356 | -.024 | .277 | .113 | .013 | .295 | -.034 | .048 | .318 | -.008 | -.243 | 1.00 | .258 | -.091 | .218 |
| EMP 1 | .325 | .277 | .051 | .245 | .129 | .004 | .103 | .091 | .219 | -.048 | .332 | -.017 | .258 | 1.00 | -.138 | .214 |
| EMP 2 | -.151 | -.168 | .125 | -.025 | .306 | -.124 | .123 | -.088 | -.009 | .055 | .080 | .012 | -.091 | -.138 | 1.00 | -.238 |
| EMP 3 | .307 | .327 | -.192 | .199 | .213 | -.063 | -.128 | .306 | .108 | -.026 | .299 | -.016 | .218 | .214 | -.238 | 1.00 |

must say that the research result is suffering from a multicollinearity problem. So, we can conclude that the research result is not suffering from the multicollinearity problem.

## Data analysis for DMC hospital

***Predictors***: (Constant), DMC Hospital has their patients' best interest at heart, DMC Hospital keeps their records accurately, Physical facilities (like machines, beds) are well functioning, Employees are always willing to help patients, Doctor and Employees give prompt service to patients, The physical environment of DMC hospital is clean., When a patient has a problem, they show a sincere interest in solving it.; DMC Hospital's employees give patients individual attention., DMC Hospital performs the service right the first time, DMC Hospital has modern equipment., Employees are polite with patients., Employees give patients personal service., Employees of DMC hospital have the knowledge to answer patients questions., Doctors And Employees are never too busy to respond to patients requests, The behavior of employees can instill confidence in patients. Dependent variable: service quality of DMC hospital is good.

**Table 6. Model summary**

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate |
|---|---|---|---|---|
| 1 | .810[a] | .655 | .503 | .59791 |

## Interpretation

According to the model summary (Table 6), researchers have tried to identify the association between service quality of DMC hospital and five dimensions of SERVEQUAL model. R square represents the strength of association between the dependent variable and independent variables. When the value of R square exceeds .5 then it suggests a moderate association between dependent variables and independent variables. From the above table, we can see that the value of R is .810 which indicates that there is a strong association between service quality dimensions and service quality of Square hospital. From the aforementioned figure, it can be observed that the value of R square is .655 which means that dependent variable is strongly associated with independent variables 65.5% of the variance in the dependent variable is explained by independent variables. Here, the value of the adjusted R square is .503. As there is a big difference between R square and adjusted R square, there are more opportunities to add more variables.

Table 7 shows that the significance value is 0.00 which is below 0.05 and the value of the F ratio is 4.312 which are significant at 5% level. So independent variables influence the dependent variable.

Using the values from the given coefficients (Table 8), the regression model is as following: service quality of DMC hospital (The five dimensions of service quality influence the DMC hospital service quality) = - .718 -.121 (TAN1) +.154 (TAN 2) +.041(TAN 3) -.035(REL 1) + .004 (REL 2) +.096 (REL 3) + .220 (RSP 1) -.117(RSP 2) +.075 (RSP 3) + .249 (ASR 1) + .213 (ASR 2) + .148(ASR 3)+.207(EMP1)+.034(EMP2)+.334(EMP3).

Standardized coefficients calculated for each predictor variables, showing the percentage of variation in the dependent variable caused by the individual independent variables. It can be revealed that the physical facilities are well functioning (TAN2), doctors and employees give prompt service to patients' (RSP1), the behavior of employees instill confidence the patients' (ASR1), DMC Hospital's employees give patients individual attention. (EMP1), Employees give patients personal service (EMP3) is significant at 5% level. The Standardized beta coefficient TAN2 is .154 which means DMC hospital's physical facilities are well functioning is an important variable that affects the service quality. The second important variable is the behavior of employees instill confidence the patients' and Standardized coefficient of ASR is .249.

From the above correlation matrix (Table 9), we can see that there are not more values which are more than 0.5 except (.594, .529, and .511). We know that if the maximum values of the correlation matrix exceed 0.5, then we must say that the research result is suffering from a multicollinearity problem. So, we can conclude that the research result is suffering from the multicollinearity problem.

**Table 7. ANOVA[a]**

| Model | | Sum of Squares | Df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| 1 | Regression | 23.125 | 15 | 1.542 | 4.312 | .000[b] |
| | Residual | 12.155 | 34 | .357 | | |
| | Total | 35.280 | 49 | | | |

**Table 8. Coefficients table**

| Model | Unstandardized coefficients | Unstandardized coefficients | Standardized coefficients | t | Sig. | Collinearity statistics | Collinearity statistics |
|---|---|---|---|---|---|---|---|
| | B | Std. Error | Beta | | | Tolerance | VIF |
| **Constant** | **-.700** | **.631** | | **-1.137** | **.263** | | |
| TAN1 | -.108 | .111 | -.121 | -.974 | .337 | .660 | 1.516 |
| TAN2 | .160 | .094 | .154 | 1.243 | .222 | .658 | 1.519 |
| TAN3 | .028 | .084 | .041 | .335 | .740 | .676 | 1.479 |
| REL1 | -.027 | .090 | -.035 | -.301 | .765 | .759 | 1.317 |
| REL2 | .003 | .096 | .004 | .033 | .974 | .721 | 1.388 |
| REL3 | .088 | .105 | .096 | .883 | .411 | .756 | 1.324 |
| RSP1 | .169 | .105 | .220 | 1.604 | .o18 | .541 | 1.849 |
| RSP2 | -.097 | .101 | -.117 | -.956 | .346 | .677 | 1.477 |
| RSP3 | .073 | .129 | .075 | .568 | .574 | .586 | 1.705 |
| ASR1 | .121 | .112 | .249 | 1.880 | .049 | .575 | 1.738 |
| ASR2 | .166 | .093 | .213 | 1.778 | .084 | .709 | 1.410 |
| ASR3 | .118 | .104 | .148 | 1.132 | .265 | .593 | 1.686 |
| EMP1 | .169 | .094 | .207 | 1.804 | .080 | .770 | 1.298 |
| EMP2 | .027 | .111 | .034 | .244 | .808 | .527 | 1.897 |
| EMP3 | .273 | .107 | .334 | 2.558 | .015 | .595 | 1.680 |

## Research findings

After completing this research, the researcher has come up with many findings. Among them, the researcher has found that the service quality of DMC and Square hospital was dependent on many factors. These factors are organized in Table 10.

In the above table (Table 10), it is shown that Square Hospital's employees give patients individual attention which is the most influential factors of Square service quality and its beta is 426. The second most influential factor is Doctors and Employees are never too busy to respond to patients' requests and its beta is .417.

On the other hand, the above figure shows that the most crucial factor of DMC hospital service quality is DMC Hospital has their patients' best interest at heart and its beta is .334 and the second most influential factor is that the behavior of employees can instill confidence in patients and its beta is .249.

For Square hospital- R is .725, R square is .525, and adjusted R square is .316. On the other hand, in DMC hospital, R is .810, R square is .655, and adjusted R square is .503. So, for both hospital, as there is a big difference between R square and adjusted R square, there are more opportunities to add more variables.

After analyzing the result coefficient table in the above figure, we can see that there are values of significance level which are below 0.05. The values are 0.003, 0.007, .009, .005 and .013 etc. So, we can reject the null hypothesis that five dimensions of service do not influence service quality of both hospitals (DMC and Square hospital).

The authors would like to point out a few limitations. One of the main constraints of the research was the time and resource constraints. We focused on the effective use of allocated time and resource. If we could go beyond the regional barriers, the research project could show more variations and dimensions of current issues. The size of the selected samples was too small for this research. The

**Table 9. Correlations table**

| | SQ 1 | TAN 1 | TAN 2 | TAN 3 | REL 1 | REL 2 | REL 3 | RSP 1 | RSP 2 | RSP 3 | ASR 1 | ASR 2 | ASR 3 | EMP 1 | EMP 2 | EMP 3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SQ 1 | 1.00 | -.032 | .217 | .212 | .195 | .264 | .069 | .316 | .007 | .173 | .529 | .304 | .333 | .344 | .338 | .594 |
| TAN 1 | -.032 | 1.00 | -.044 | .098 | .170 | .230 | .221 | .192 | .079 | .110 | .072 | .177 | .309 | -.104 | -.082 | -.127 |
| TAN 2 | .217 | -.044 | 1.00 | .259 | .260 | .200 | .028 | -.075 | .038 | -.233 | .077 | .212 | .151 | -.142 | .203 | .080 |
| TAN 3 | .212 | .098 | .259 | 1.00 | .154 | .247 | -.017 | -.070 | .111 | .234 | .010 | .222 | .435 | -.019 | .137 | .134 |
| REL 1 | .195 | .170 | .260 | .154 | 1.00 | .104 | .056 | .105 | .106 | .261 | .146 | .200 | .109 | .032 | .085 | .188 |
| REL 2 | .264 | .230 | .200 | .247 | .104 | 1.00 | .144 | .094 | .028 | .163 | .083 | .254 | .267 | -.017 | .020 | .286 |
| REL 3 | .069 | .221 | .028 | -.017 | .056 | .144 | 1.00 | -.196 | .143 | -.008 | .043 | .052 | -.055 | .164 | .223 | .007 |
| RSP 1 | .316 | .192 | -.075 | -.070 | .105 | .094 | -.196 | 1.00 | -.153 | .146 | .511 | -.156 | .165 | .052 | -.176 | .014 |
| RSP 2 | .007 | .079 | .038 | .111 | .106 | .028 | .143 | -.153 | 1.00 | .328 | -.078 | .271 | .164 | .190 | .280 | .032 |
| RSP 3 | .173 | .110 | -.233 | .234 | .261 | .163 | -.008 | .146 | .328 | 1.00 | .064 | .139 | .129 | .221 | -.096 | .139 |
| ASR 1 | .529 | .072 | .077 | .010 | .146 | .083 | .043 | .511 | -.078 | .064 | 1.00 | -.049 | .209 | .160 | .253 | .265 |
| ASR 2 | .304 | .177 | .212 | .222 | .200 | .254 | .052 | -.156 | .271 | .139 | -.049 | 1.00 | .181 | .035 | .123 | .305 |
| ASR 3 | .333 | .309 | .151 | .435 | .109 | .267 | -.055 | .165 | .164 | .129 | .209 | .181 | 1.00 | -.035 | .274 | .210 |
| EMP 1 | .344 | -.104 | -.142 | -.019 | .032 | -017 | .164 | .052 | .190 | .221 | .160 | .035 | -.035 | 1.00 | .278 | .226 |
| EMP 2 | .338 | -.082 | .203 | .137 | .085 | .020 | .223 | -.176 | .280 | -.096 | .253 | .123 | .274 | .278 | 1.00 | .389 |
| EMP 3 | .594 | -.127 | .080 | .134 | .188 | .286 | .007 | .014 | .032 | .139 | .265 | .305 | .210 | .226 | .389 | 1.00 |

topic has required the involvement of a vast number of respondents in the process. Illiterate and uneducated respondents (patients) were unable to understand and answer the questions properly. In order to conduct such a large-scale project, previous experience helps a lot. However, the researcher lacks in that. The research did not solicit any open-ended questions. Hence, it was not possible to collect any additional comments or thoughts about services quality.

## 6. RECOMMENDATIONS

The service quality of square hospital is better than DMC hospital in terms of physical environment, modern equipment, and individual attention. The service quality of Square hospital is 1.400 and DMC is -.718. So, the service quality of DMC should be increased in the physical environment, modern equipment, and prompt service sections also. Although the service quality of public and private hospital is not standard in our country, patients are helpless to get this kind of poor health service.

Give prompt service and individual attention to patients in both DMC and square hospital. As the significant level is very high (.319, and .220 respectively), doctors and employees should give prompt

**Table 10. Analysis of factors related to two hospitals**

| Square hospital | DMC hospital |
|---|---|
| **Tangibility:(construct 1)**<br>**1.** Square Hospital has up-to-date equipment. (Sig.-.312)<br>2. Physical facilities (like machines, beds) are well functioning. (sig.-.273)<br>3. The physical environment of Square hospital is clean. (sig.-.142) | **Tangibility (construct 1)**<br>**1.** DMC Hospital has up-to-date equipment. (Sig.-.121)<br>2. Physical facilities (like machines, beds) are well functioning. (sig.-.154)<br>3. The physical environment form hospital is clean. (sig.-.041) |
| **Reliability: (construct 2)**<br>**1.** When a patient has a problem, they show a sincere interest in solving it. (sig.-.083)<br>2.Square Hospital performs the service right the first time. (sig.-.021)<br>3. Square Hospital keeps their records accurately. (sig.-.129) | **Reliability: (construct 2)**<br>**1.** When a patient has a problem, they show a sincere interest in solving it. (Sig.-.035)<br>2. DMC Hospital performs the service right the first time. (sig.-.004)<br>3. DMC Hospital keeps their records accurately. (sig.-.096) |
| **Responsiveness: (construct 3)**<br>**1.** Doctor and Employees give prompt service to patients. (sig.-.319)<br>2. Employees are always willing to help patients. (sig.-.106)<br>3. Doctors and Employees are never too busy to respond to patients' requests. (sig.-417) | **Responsiveness: (construct 3)**<br>**1.** Doctor and Employees give prompt service to patients. (sig.-.220)<br>2. Employees are always willing to helppatients. (Sig.-.117)<br>3. Doctors and Employees are never too busy to respond to patients' requests. (sig.-.075) |
| **Assurance: (construct4)**<br>**1.** The behavior of employees can instill confidence in patients. (sig.-.209.)<br>2. Employees are polite with patients. (sig.-.277)<br>3. Employees of Square hospital have the knowledge to answer patients.'s questions. (sig.-.377) | **Assurance: (construct4)**<br>**1.** The behavior of employees can instill confidence in patients. (sig.-.249)<br>2. Employees are polite with patients. (sig.-.213)<br>3. Employees of DMC hospital have the knowledge to answer patients.'s questions. (sig.-.148) |
| **Empathy: (construct 5)**<br>**1.** Square Hospital's employees give patients individual attention. (sig.-426)<br>2. Employees givepatients personal service. (sig.-.071)<br>3. Square Hospital has their patients' best interest at heart. (.361) | **Empathy: (construct 5)**<br>**1.**DMC Hospital's employees give patients individual attention. (sig.-.207)<br>2. Employees givepatients personal service. (sig.-.034)<br>3.DMC Hospital has their patients' best interest at heart. (sig.-.334) |

service to patients, doctors and employees should always be willing to help patients, and employees and doctors should never be too busy to respond patients. Both DMC hospital and Square hospital have their patients' best interest at heart and its significance is .361 and .334 respectively. So, both hospitals should give more individual attention, and should give personal service to patients to develop service quality. DMC hospital has better and more modern equipment than the square hospital, but this equipment needs proper care and daily access in patients' treatment.

## 7. CONCLUSION

Since the demand for health care services is increasing because of the growing rate of population in Bangladesh, public hospitals should be very serious to improve their services quality in some dimensions because they are the major players in meeting the demand of general population. If Dhaka Medical focuses on the issues they are lagging behind, people can trust them in case of obtaining services. At the same time, Square Hospital should bring modern equipment. If both sectors improve healthcare services simultaneously, people can afford medical services within the country instead of going abroad.

Given that the technologies change very fast (Schlesinger & Rahman, 2016) and business conditions also change dynamically, the services quality of hospitals needs to be evaluated from time to time. The authors propose that an integrated and scalable information system in healthcare can improve the services quality in the healthcare sector. The previous studies also support this proposal as a flexible standards strategy (Braa et al., 2007). Hospitals in Bangladesh need to consider developing real-time business intelligence (Rutz et al., 2012) to improve the quality of decisions and thereby provide better services to patients.

Accountability is very much needed to run the hospitals and provide patients with the best services with sincerity and professionalism. Attention needs to be paid to modernize technology, invent and develop technology, locally, to make them cheaper. It is important to conduct adequate training periodically to doctors, nurses, administration and general employees. The hospital administration needs to make sure doctors are aware of the latest research discoveries in healthcare. Lastly, the administration needs to ensure professionals and general employees are taking utmost care in dealing with customers with patience and soft skills.

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## APPENDIX A: QUESTIONNAIRE

Welcome to this survey. Please help us by answering the following questions. Your answers will be used only for research purpose. Thank you.

## RESPONDENT'S PROFILE

Name:

Gender:

Age:

Occupation:

Nationality:

Questionnaire for DMC hospital;

This section deals with your opinion of DMC hospital. Please, show the extent to which you think hospitals 'should' possess the following features. We are interested in knowing your expectations from hospitals of Bangladesh. You should rank each statement as follows (Box 1).

Questionnaire for Square hospital;

This section deals with your opinion of SQUARE hospital. Please, show the extent to which you think hospitals 'should' possess the following features. We are interested in knowing your expectations from hospitals of Bangladesh. You should rank each statement as follows (Box 2.)

**Box 1.**

| **Strongly disagree** | **Disagree** | **Neutral** | **Agree** | **Strongly agree** |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |

**Put a tick (√) on your choice of answer.**

| **Code No.** | **Statement** | **Scores** | | | | |
|---|---|---|---|---|---|---|
| TAN01 | Dhaka Medical has modern equipment. | 1 | 2 | 3 | 4 | 5 |
| TAN02 | Physical facilities (like machines, beds) are well functioning. | 1 | 2 | 3 | 4 | 5 |
| TAN03 | The physical environment of Dhaka Medical is clean. | 1 | 2 | 3 | 4 | 5 |
| REL01 | When a patient has a problem, they show a sincere interest in solving it. | 1 | 2 | 3 | 4 | 5 |
| REL02 | Dhaka Medical performs the service right the first time. | 1 | 2 | 3 | 4 | 5 |
| REL03 | Dhaka Medical keeps their records accurately. | 1 | 2 | 3 | 4 | 5 |
| RSP01 | Doctor and Employees give prompt service to patients. | 1 | 2 | 3 | 4 | 5 |
| RSP02 | Employees are always willing to help patients. | 1 | 2 | 3 | 4 | 5 |
| RSP03 | Doctors and Employees are never too busy to respond to patients' requests. | 1 | 2 | 3 | 4 | 5 |
| ASP01 | The behavior of employees can instill confidence in patients. | 1 | 2 | 3 | 4 | 5 |
| ASP02 | Employees are polite with patients. | 1 | 2 | 3 | 4 | 5 |
| ASP03 | Employees of Dhaka Medical have the knowledge to answer patient's questions. | 1 | 2 | 3 | 4 | 5 |
| EMP01 | Dhaka Medical's employees give patients individual attention. | 1 | 2 | 3 | 4 | 5 |
| EMP02 | Employees give patients personal service. | 1 | 2 | 3 | 4 | 5 |
| EMP03 | Dhaka Medical has their patients' best interest at heart. | 1 | 2 | 3 | 4 | 5 |
| SQ01 | Service quality of Dhaka Medical is good. | 1 | 2 | 3 | 4 | 5 |

**Box 2.**

| **Strongly disagree** | **Disagree** | **Neutral** | **Agree** | **Strongly agree** |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |

**Put a tick (√) on your choice of answer.**

| **Code No.** | **Statement** | **Scores** | | | | |
|---|---|---|---|---|---|---|
| TAN01 | SQUARE Hospital has modern equipment. | 1 | 2 | 3 | 4 | 5 |
| TAN02 | Physical facilities (like machines, beds) are well functioning. | 1 | 2 | 3 | 4 | 5 |
| TAN03 | The physical environment of Square hospital is clean. | 1 | 2 | 3 | 4 | 5 |
| REL01 | When a patient has a problem, they show a sincere interest in solving it. | 1 | 2 | 3 | 4 | 5 |
| REL02 | Square Hospital performs the service right the first time. | 1 | 2 | 3 | 4 | 5 |
| REL03 | Square Hospital keeps their records accurately. | 1 | 2 | 3 | 4 | 5 |
| RSP01 | Doctor and Employees give prompt service to patients. | 1 | 2 | 3 | 4 | 5 |
| RSP02 | Employees are always willing to help patients. | 1 | 2 | 3 | 4 | 5 |
| RSP03 | Doctors and Employees are never too busy to respond to patient's requests. | 1 | 2 | 3 | 4 | 5 |
| ASP01 | The behavior of employees can instill confidence in patients. | 1 | 2 | 3 | 4 | 5 |
| ASP02 | Employees are polite with patients. | 1 | 2 | 3 | 4 | 5 |
| ASP03 | Employees of SQUARE hospital have the knowledge to answer patient's questions. | 1 | 2 | 3 | 4 | 5 |
| EMP01 | SQUARE Hospital's employees give patients individual attention. | 1 | 2 | 3 | 4 | 5 |
| EMP02 | Employees give patients personal service. | 1 | 2 | 3 | 4 | 5 |
| EMP03 | SQUARE Hospital has their patients' best interest at heart. | 1 | 2 | 3 | 4 | 5 |
| SQ01 | Service quality of Square hospital is good. | 1 | 2 | 3 | 4 | 5 |

*Fahima Khanam is a Lecturer in Marketing at the European University of Bangladesh. Prior to joining the European University, she served as Lecturer in the Department of Business Administration at Victoria University and German University, Bangladesh where she taught Principles of Marketing, Marketing Management, Operations Management, International Business, and Bank Management. She also worked as a corporate professional in The Daily 'Prothom Alo', one of the top daily newspapers in Bangladesh. She holds an MBA in Marketing from the University of Dhaka, Bangladesh. Her most recent publication appeared in the International Journal of Customer Relationship Marketing and Management (IJCRMM). Her principal research interests include e-commerce, online shopping, social media marketing, green marketing, and Facebook marketing.*

*Nayem Rahman is an Information Technology (IT) professional. He has implemented several large projects using data warehousing and big data technologies. He is currently working toward the Ph.D. degree in the Department of Engineering and Technology Management at Portland State University, USA. He holds an M.S. in Systems Science (Modeling & Simulation) from Portland State University, Oregon, USA and an MBA in Management Information Systems (MIS), Project Management, and Marketing from Wright State University, Ohio, USA. He has authored 40 articles published in various conference proceedings and scholarly journals. His most recent publications appeared in the International Journal of Business Analytics (IJBAN). His principal research interests include Big Data Analytics, Big Data Technology Acceptance, Data Mining for Business Intelligence, and Simulation-based Decision Support System (DSS).*