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# Relationship between Medical Examination Service Quality and Patient Satisfaction in Significant Hospital in Developing Country

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***Summary***

***Objective*** *- The aim of this study to demonstrate that have relationship between healthcare service quality (SQ) and patient satisfaction (PS) in the new model of research, ensure method of mesuring quality by new tool's base on customer expectation. Subject and method: The study obtained feedback from patients, measure consumers' perceptions of healthcare quality in both functional and technical quality including, using the SERVQUAL instrument with five generic dimensions (the original 22 scores instruments) for functional quality to combinate with the 8 dimensions for technical quality; Beside, measure PS by Tool of Victorian Patient Satisfaction Monitor (VPSM) with 6 origin dimensions (25 scores instruments). Survey on General clinic department at the private general hospital in Vietnam country's one developing country. The study refers to the period from December 2013 to Jan 2014.* ***Result*** *- Altogether 420 persons were interviewed and 396 patients were identified by stratified random sampling. Most outpatients whose length of stay in general clinic department in the Bachmai hospital. The firth method's Measuring healthcare quality by functional and technical quality; The functional quality by SERQUAL intrument with 5 items (22 score) and Technical quality item (8 score). Servqual instrument had 5 items are the"Tangible", "Reliability", "Responsiveness", "Assurance", "Empathy" including and Technical quality item's Technical Quality; After performing factor analysis, we have four elements are drawn: Reliability (FQA1) with 11 variables, Empathy (FQA2) with 4 variables, Tangible (FQA3) with 3 variables, and Technical quality(TQA) had 8 variables with highly Corrected Item-Total Correlation of PS and reliability coefficient. The second method's measuring healthcare through Tool of VPSM with 6 origin dimensions. After performing factor analysis, we have six elements are drawn: Access and Admission Index (DVa), General Patient Information Index (DVb), Treatment and Related Information Index (DVc), Complaints Management Index (DVd), Physical Environment Index (DVe), Discharge and Follow-up Index (DVf).The relationship between patient satisfaction (PS) and service quality (SQ) with R = 0.811 (sig = 0.0001).* ***Conclusion*** *- The firth, Adjusted research model for the public hospital have four contruct from levels of customer satisfaction about service quality is influenced by the SERVQUAL (3 items are reliability, empathy, and tangibles with 18 scores) and Technical Quality intrument (8 scores) with total of 26 scores. The second, Adjusted research model for the public hospital by Tool of VPSM have sixcontruct from levels of patient satisfaction about service quality (6 itemswith origine 25 scores). There is a strongly positive relationship between patient satisfaction (PS) and service quality (SQ) with high significant, ensure method of mesuring healthcare service quality by new tool's base on customer expectation.*

***Keywords - Measuring Healthcare quality, Servqual, functional quality, technical quality, VPSM***

## 1. Bachround

The private hospital as TriDuc General Hospital is the significant Private hospitals in Vietnam Country as one developing country.[1],[2] The hospital was founded in 2007, due to the fact that the quality of medical care is inseparable from the non-medical services, The hospital has chosen to combine the best technology, medical expertise and the quality of customer care. This hospital has been created as a

comprehensive medical facility, covering most of medical and surgical specialty needs.

Measurement of patients' satisfaction with services provided by the concerned hospital is important from two angles. Patients constitute the hospital's direct client.[3-4] Parasuman et al (1985, 1988), and some authors were developed a conceptual model of service quality (SQ). It had five gaps that the clients's evaluation of SQ. The Gap 5 on the diagram designs the difference between clients's expectations and customers's perceptions, helped to as the perceived SQ.[5-7] Some researchs were identified that have relationship between perceived SQ with patient satisfaction (PS);[8-9] Almost authors showed a positive relationship between percerved SQ with clients satisfaction as well as clients loyalty (Source: Magi and Julander, 2009).

Measures healthcare quality by SERVQUAL instrument has been the predominant method used to mesure consumers; perceptions of service quality; It has five generic dimensions or factors (the original 22-item instrument) and are stated as follows: **(1)** Tangibles: Physical facilities, equipment and appearance of personnel; **(2)** Reliability: Ability to perform the promised service dependably and accurately; **(3)** Responsiveness: Willingness to help customers and provide prompt service; **(4)** Assurance (including competence, courtesy, credibility and security). Knowledge and courtesy of employees and their ability to inspire trust and confidence; **(5)** Empathy (including access, communication, understanding the customer).[10] Caring and individualized attention that the firm provides to its customers, using a point likert scale measuring both customer expectation and the quality of services expected by perceptions of services received then feedback from customer surveys can be highly misleading from both a policy and an operational perspective, the application of SERVQUAL approach is more specified with example in a catering hospital.[11-13] In addition, we refer to the John E. Ware model to measure for technical quality of healthcare (Questionnaire items refer to eight dimension are: Abilily, accuracy, experience, throughness, and training of providers as well as the extent to which they pay attention to details, avoid mistakes, give good examinations, and clearly explain what is expected of their patients).[14]

Measures Patient Satisfaction by Tools of Victorian Patient Satisfaction Monitor (VPSM) - (2012) contains six dimension with 25 survey items (The OCI items) are carefully grouped to derive the six sub-indices of care which are: Access and Admission Index (AAI), General Patient Information Index (GPII), Treatment and Related Information Index (TRII), Complaints Management Index (CMI), Physical Environment Index (PEI), Discharge and Follow-up Index (DFI).[15],[16]

During quality measuring processing, we need to certify that there are relationship between service quality (SQ) and patient satisfaction (PS). We used new model for quality measuring process Service quality by "SEVQUAL instrument combinate John E. Ware model", beside we used Tools of VPSM's widen to developing country as Vietnam which the very good tool in the developed country as Australian. So, the aim of this report to focus on certify that have correlation between SQ and PS with high significant through the new model of research, ensure method of mesuring healthcare service quality by new tool's base on customer expectation from perceptions of services received.

## 2. Rearch Methodology

### 2.1. Selection of Study Area: General clinic department, Private Hospital

### 2.2. Selection of Respondents:

Selection of study set and sampling of patients: Private hospital's TriDuc General hospital was selected for the study. We were build-up the sampling frame of patients. Study in patients before leaving the hospital who have completed the process of examination in the hospital.

### 2.3. Method

Interval Measurement for Service quality and Patient Satisfaction: This measurement has the power to measure the distance between any two points on the scale.Respondents are to provide answers on their expectations and perceptions based on the 5 point Likert scale. Number 1 implies SD - Strongly Disagree, Number 2 implies D - Disagree, Number 3 implies N – Neither disagree or agree, Number 4 implies A – Agree, Number 5 implies SA - Strongly agree.[10]

**Service Quality (SQ):** Functional quality had 5 items with 22 scores[5-8] and Technical quality had 8 scores[14]:

**H1a: Reliability (IVA):** When hospital promises to do something by a certain time, they do it (A1). Hospital/staff have notification to avoid mistakes (A2). Hospital perform the services for me right at the first time (A3). Doctors are clearly explained and reference to comments patients before appoint medical tests (A4). When customer has a problem, Doctors/staff exhibits sincere interest in solving patients' problems (A5).

**H1b: Responsiveness (IVB):** Hospital staff make information easily obtainable in explanation of procedures or services provided (B1). Doctors/staffs give prompt services to customers (B2). Doctors/staffs are always willing to help patients (B3). The Doctors are never too busy to respond to customers requests (B4).

**H1c: Assurance (IVC):** Attitude and behavior of Doctors/staff make confidence in customers (C1). Patients feel secure in receiving medical care (C2). Hospital staff are

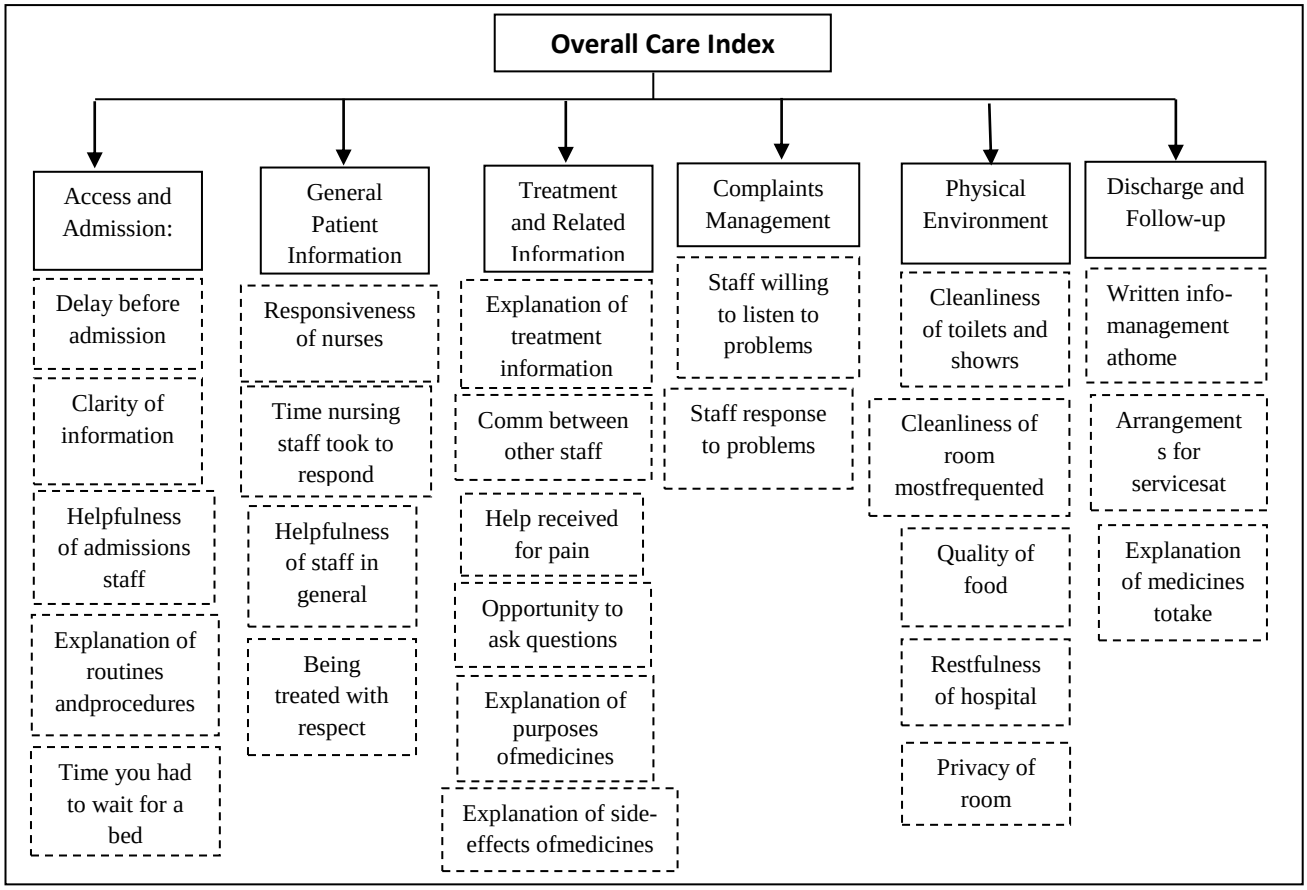
polite to customers (C3). Doctors/staff have knowledge to answer customers' questions (C4).

**H1d: Empathy (IVD):** Hospital make sure choice individualised of patients (D1). Operating hours of hospital are convenient to Customers (D2). Doctors focus attention what most worried patients (D3). Employees of hospital understand the specific needs of their customers (D4). Hospital staff guide patients where to go and what to do (D5).

**H1e: Tangibles (IVE):** The hospital's equipment is modern equipments and well maintained (E1). Physical facilities are virtually appealing (E2). Doctors and staff are well dressed and appear neat (E3). Clean, comfortable and Visually attractive environment (E4).

**H1f: Techinical Quality (IVF):** Doctor's office has everything needed to provide complete care (F1). Doctor make me confidence that their diagnosis is correct (F2). I belive in results tests of machines system, technology at the hospital is accurate (F3). I have seen Doctors/staff very experience with my medical problems (F4). Cooperation between doctors, nurses and other hospital staff about your treatment (F5). My doctors are very competent and well-trained (F6). When I go for medical care, they are careful to check everything when treating and examining me (F7). Doctors/staff have explained thoroughly medical conditions to patients (F8).

**Patients satisfaction (PS):** Measure Patient satisfaction by 6 dimensions are: Access and Admission (DVa), General Patient information (DVb), Treatment and Related information (DVc), Complaints Management (DVd), Physical Environment (DVe) and Discharge and Follow-up (DVf).




*(Source: VPSM Annual Report 2012 – 12)*

**Figure 1: VPSM indices and items**[15],[16]

***Independent Variables (IV) and Dependent Variables (DV):***

In the case, Service quality can be Independent variable (IV) and Dependent variable (DV). Patients Satisfaction (PS), Functional quality (FQ) and Technical quality (TQ) can be Independent variable or Dependent variable:

1) First, Dependent variable (DV) is Service Quality (SQ). Independent variables (DV) are Reliability, Responsiveness, Assurance, Empathy, Tangibles and Technical Quality.
2) Second, Dependent variable (DV) is Functional Quality (FQ). Independent variables (IV) are Reliability, Responsiveness, Assurance, Empathy and Tangibles.
3) Third, Dependent variable (DV) is Technical Quality. Independent variable (IV) is one

dimension with 8 items of Technical quality of care.

4) Fourth, Dependent variable (DV) is Patient Satisfaction (PS). Independent variable (IV) is Service Quality (SQ). Measure Patient satisfaction by 6 dimensions are: Access and Admission (DVa: 5 variables), General Patient information (DVb: 4 variables), Treatment and Related information (DVc: 6 variables), Complaints Management (DVd: 2 variables), Physical Environment (DVe: 5 variables) and Discharge and Follow-up (DVf: 3 variables).

***Research Hypotheses:*** As a result, for the purpose of this research, we argue the SERVQUAL indices is reliable and that all the five dimensions of patient satisfaction in functional quality by the SERVQUAL instrument and eight dimentions of patient satisfaction in technical quality are significant in the setting of health care.

- H1a (Hypothesis 1a): There is relationship between Reliability and Service Quality.
- H1b (Hypothesis 1b): There is a relationship between Responsiveness and Service Quality.
- H1c (Hypothesis 1c): There is a relationship between Assurance and Service Quality.
- H1d (Hypothesis 1d): There is a relationship between Empathy and Service Quality.
- H1e (Hypothesis 1e): There is a relationship between Tangibles and Service Quality.
- H1f (Hypothesis 1f): There is a relationship between Technical quality and Service Quality.
- H12 (Hypothesis 12): There is a relationship between Service quality and patient satisfaction.

Thereby proposed some suggestions to improve the quality of health care, ensure patient satisfaction for general clinic department at TriDuc's one Private Hospital

**3.2 Research Framework:**

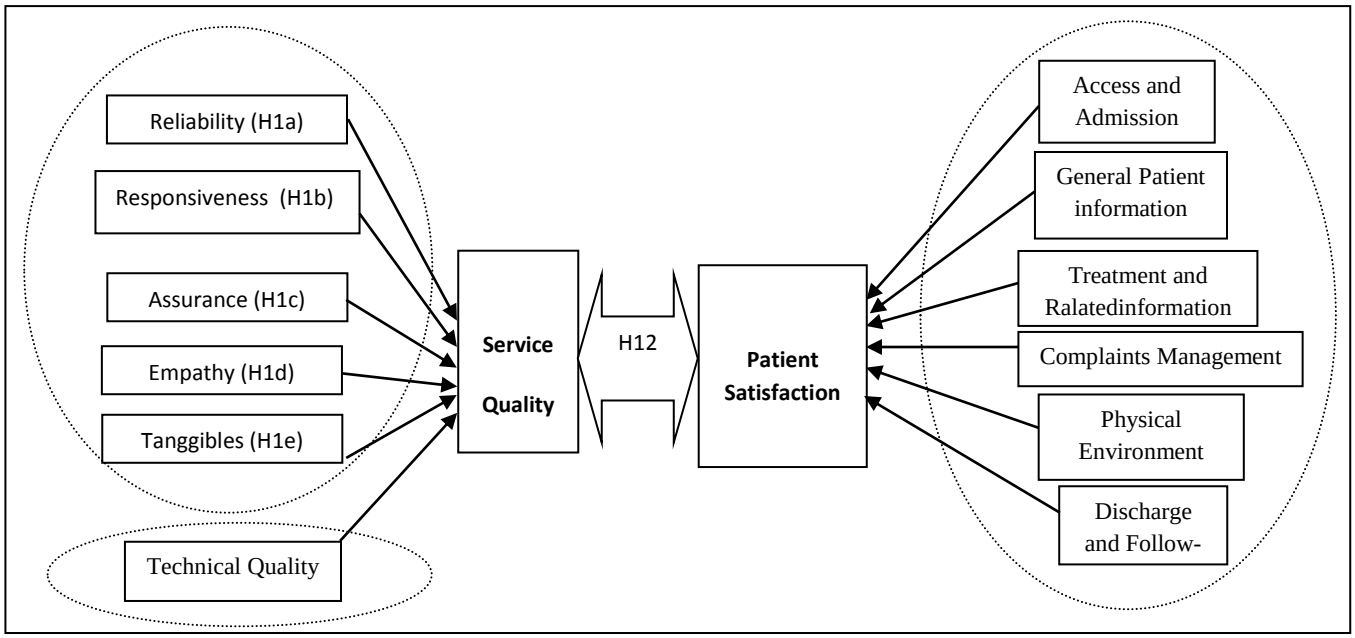



**Figure 2: Research Frameword:**

- H1a (Hypothesis 1a): There is relationship between Reliability and Service Quality.
- H1b (Hypothesis 1b): There is a relationship between Responsiveness and Service Quality.
- H1c (Hypothesis 1c): There is a relationship between Assurance and Service Quality.
- H1d (Hypothesis 1d): There is a relationship between Empathy and Service Quality.
- H1e (Hypothesis 1e): There is a relationship between Tangibles and Service Quality.
- H1f (Hypothesis 1f): There is a relationship between Technical quality and Service Quality.
- H12 (Hypothesis 12): There is a relationship between Service quality and patient satisfaction.

In the case, Service quality can be Independent variable (IV) and Dependent variable (DV). Patients Satisfaction (PS), Functional quality (FQ) and Technical quality (TQ) can be Independent variable or Dependent variable:

1/ First, Dependent variable (DV) is Service Quality (SQ). Independent variables (DV) are Reliability, Responsiveness, Assurance, Empathy, Tangibles and Technical Quality.

2/ Second, Dependent variable (DV) is Functional Quality (FQ). Independent variables (IV) are Reliability, Responsiveness, Assurance, Empathy and Tangibles.

3/ Third, Dependent variable (DV) is Technical Quality. Independent variable (IV) is one dimension with 8 items of Technical quality of care.

4/ Fourth, Dependent variable (DV) is Patient Satisfaction (PS). Independent variable (IV) is Service Quality (SQ). Measure Patient satisfaction by 6 dimensions are: Access and Admission (DVa: 5 variables), General Patient information (DVb: 4 variables), Treatment and Related information (DVc: 6 variables), Complaints Management (DVd: 2 variables), Physical Environment (DVe: 5 variables) and Discharge and Follow-up (DVf: 3 variables).

**3.3 Research Hypotheses**

As a result, for the purpose of this research, we argue that SERVQUAL is reliable and that all the five dimensions of service quality in the SERVQUAL instrument are significant in the setting of health care.

- H1a (Hypothesis 1a): There is relationship between Reliability and Service Quality.
- H1b (Hypothesis 1b): There is a relationship between Responsiveness and Service Quality.
- H1c (Hypothesis 1c): There is a relationship between Assurance and Service Quality.
- H1d (Hypothesis 1d): There is a relationship between Empathy and Service Quality.
- H1e (Hypothesis 1e): There is a relationship between Tangibles and Service Quality.

➢ In addition to the five dimensions above, technical quality is also examined and empirically validated in the health care context by previous studies. As a result, we propose that technical quality is a significant dimension of health care quality as well:

- H1f (Hypothesis 1f): There is a relationship between Technical quality and Service Quality.

➢ Relationship between Service quality and Patient satisfaction is also examined in the study:

- H12 (Hypothesis 12): There is a relationship between Service quality and patient satisfaction.

❖ **Interval Measurement for Service quality and Patient Satisfaction:**

This measurement has the power to measure the distance between any two points on the scale.

Respondents are to provide answers on their expectations and perceptions based on the 5 point Likert scale.

Number 1 implies SD - Strongly Disagree, Number 2 implies D - Disagree, Number 3 implies N - Neither disagree or agree, Number 4 implies A – Agree, Number 5 implies SA – Strongly agree.

**Questionnaire Administration:**

Questionnaire were completed by outpatients at Private hospital (n= 396) over a period of one month.

All Data analysis has been carried out with the Statistical Package for the Social Sciences (IBM SPSS 21.0).[10-11]

## 3. Results

From the samples characteristics in Private hospital: 420 questionnaires were distributed, the rate of completion is 94.29% (n = 396). There is a 396 questionnaire are completed, frequency distribution of gender in the hospital are 173 male (43.7%) and 223 female (56.3%).

**Table 1: Descriptive Statistics of the Service Quality and Patient Satisfaction constructs private hospital.**

| | Dimensions | N | Mean | SD (Std. Deviation) | Reliability (Cornbach Alpha) |
|---|---|---|---|---|---|
| **Service Quality (SQ)** | Access and Admission (DVa) | *396* | *3.9965* | *0.58043* | *0.883* |
| | General Patient information (DVb) | *396* | *4.1995* | *0.60219* | *0.895* |
| | Treatment and Related information (DVc) | *396* | *4.0299* | *0.59014* | *0.896* |
| | Complaints Management (DVd) | *396* | *4.1679* | *0.63162* | *0.900* |
| | Physical Environment (DVe) | *396* | *3.8212* | *0.73382* | *0.912* |
| | Discharge and Follow-up (DVf) | *396* | *4.0118* | *0.64903* | *0.896* |
| **Patient Satisfaction (PS)** | Reliability (IVA) | *396* | *4.0404* | *0.57420* | *0.881* |
| | Responsiveness (IVB) | *396* | *4.2083* | *1.07039* | *0.292* |
| | Assurance (IVC) | *396* | *4.1951* | *0.54073* | *0.839* |
| | Empathy (IVD) | *396* | *4.1040* | *0.51340* | *0.774* |
| | Tangible (IVE) | *396* | *3.9324* | *0.64559* | *0.829* |
| | Technical Quality (IVF) | *396* | *4.0464* | *0.61419* | *0.942* |

Patients were basically satisfy the needs of the patient but still not really satisfied. The satisfaction of patients using health care services in private hospitals is to achieve high satisfaction.

**3.1. Reliability (Cronbach Alpha) of Variable and Average of Healthcare service quality Variables:**

**3.1.1. Reliability (Cronbach Alpha) of SERVICE QUALITY:**

Cronbach Alpha for the firth construct **(Reliability: IVA),** the second construct **(Responsiveness: IVB),** the third construct **(Assurance: IVC),** the fourth construct **(Empathy: IVD)**, the fifth construct **(Tangibles: IVE)**, the sixth construct (**Technical Quality: IVF)**of private hospital

are 0.881, 0.292, 0.839, 0.774, 0.829, 0.942, respectively. Therefore, Responsiveness (IVB) dimension with 4 items (IVB1, IVB2, IVB3, IVB4) of study in the hospital is moved, because IVB dimension have reliability coefficient = 0.292 < 0.05.

**3.1.2. Reliability (Cronbach Alpha) of PATIENT SATISFACTION:**

Cronbach Alpha for the firth construct **(Access and Admission: DVa),** the second construct **(General patient information: DVb),** the third construct **(Treatment and Related information: DVc),** the fourth construct **(Complaints Management: DVd)**, the fifth construct **(Physical Environment: DVe)**, the sixth construct **(Discharge and Follow-up: DVf)** of private hospital are 0.883, 0.895, 0.896, 0.900, 0.912, and 0.896, respectively. As reliability of the instrument helps to provides consistency in the results and the Cronbach alpha is used to measure the reliability of the data (Green et al., 2000). Overall Cronbach Alpha of private data along with service quality construct provides values greater than 0.60, as the values of Cronbach Alpha greater than 0.60 is acceptable (Nunnally, 1978).

**3.3. Exploratory Factor Analysis (EFA) for Private hospital:**

**3.3.1. CEA for SERVICE QUALITY:**

***CEA for Functional quality (SERVQUAL) of Private hospital:*** After Factor analysis discovered 4 EFA with quality components, there are one dimension which Responsiveness (IVB) with 4 items (IVB1, IVB2, IVB3 and IVB4) have reliability coefficient = 0.292 < 0.05, So IVB component will be remove. After performing factor analysis of 18 variables as above (There are 4 variables of 22 items are removed: IVB1, IVB2, IVB3 and IVB4), we have 4 elements are drawn as follows: **Factor 1** (FQA1 - Reliability) includes the following 11 variables: IVA1, IVA2, IVA3, IVA4, IVA5, IVC1, IVC2, IVC4, IVD1, IVD3 and IVD4. **Factor 2** (FQA2 – Empathy) includes the following 4 variables: IVC3, IVD2, IVD5 and IVE3. **Factor 3** (FQA3 - Tangibles) includes the following 3 variables: IVE1, IVE2 and IVE4.

***CEA for Technical quality (Technical Quality Care) of Private hospital:*** Factor analysis discovered 8 EFA with quality components: After performing factor analysis of 8 variables as above, we have 1 elements are drawn as follows: KMO = 0.927 (> 0.5), this mean that the sample size was matches for the factor analysis technique. Bartlett's measure tested the null hypothesis that the original correlation matrix is an identity matrix. In order to be able to use Bartlett test for sphericity should be significant = 0.000 < 0.05. It explained 71.101% of the difference of these variables, the remainder were difficult explained by the factor and variables in the analysis.

***CEA for SERVICE QUALITY***

Factor analysis discovered 4 EFA with quality service components: After performing factor analysis of Service quality (FQA1, FQA2, FQA3, TQA) with 26 variables as above (18 items of functional quality and 8 items of technical quality), we have 4 elements are drawn as follows: KMO = 0.782 is > 0.5, this mean that the sample size was matches for the factor analysis technique. Bartlett's measure tested the null hypothesis that the original correlation matrix is an identity matrix. In order to be able to use Bartlett test for sphericity should be significant = 0.000 < 0.05. Therefore suitable to conditions of factor analysis.

4 factors (FQA1, FQA2, FQA3, TQA) explained almost 74.294% with variance extracted, the remainder were difficult explained by the variables in the analysis. The rotation converged in 4 iterations were consistent with the researcher model had formulated in this research. So, this research model has been proven to be the most suitable measurement for service quality for the current research field. Thus, factor analysis has demonstrated that the model is constructed form 4 major constructs (Completed the demonstration of the component matrix factor rotation and structures of the study). After performing factor analysis, we have four elements are drawn: **Factor 1** (FQA1 - Reliability) includes the following 11 variables (IVA1: IVA2: IVA3: IVA4, IVA5, IVC1, IVC2, IVC4, IVD1, IVD3, IVD4). **Factor 2** (FQA2 - Empathy) includes the following 4 variables: **(**IVC3, IVD2, IVD5, IVE3). **Factor 3** (FQA3 - Tangibles) includes the following 3 variables (IVE1, IVE2, IVE4). **Factor 4** (TQA – Technical Quality) includes the following 8 variables (IVF1, IVF2, IVF3, IVF4, IVF5, IVF6, IVF7, IVF8).

**3.3.2. CEA for Patient Satisfactions (PS) of Public hospital:**

Factor analysis discovered EFA with Patient Satisfaction Variable Group:

Continues to performing Patient Satisfaction (dependent Variable are) analysis of 6 factor as above (DVa, DVb, DVc, DVd, DVe, DVf), we have 1 elements are drawn and obtained results (Table 3.2): KMO = 0.917 (>0.5), sig. = 0.000 (<0.05) in Bartlett's test of sphericity. Therefore suitable to conditions of factor analysis. One factor (Only one component was extracted) is drawn with variance extracted is 77.347% (Table 3.2).

They explained almost 77.347% only of the variance. The rest could not be explained by the variables included in the analysis. As can be seen in Table 3.2 (Total Variance Explained), the rotation converged in 6 iterations that were consistent with the framework the researchers had formulated in the current research thus this model was proven to be the most appropriate measurement for functional quality for the current field of research. Thus

factor analysis has demonstrated that the model is constructed form 6 major constructs defined in Table 3.2 (Demonstrating Rotated Component Matrix and Constructs of the Research).

As can be seen as above, the rotation converged in 6 iterations that were consistent with the framework the researchers had formulated in the current research thus this model was proven to be the most appropriate measurement for Patient Satisfaction for the current field of research.

### 3.4. Cronbach Alpha of factor and Model for Private hospital:

#### 3.4.1. Reliability (Cronbach Alpha) for SERVICE QUALITY (SQ) in Model of research for Private hospital:

The reliability coefficient, Quality service is bring to checks in the Cronbach alpha coefficient for the fourth construct of Service Quality (SQ), Test results: Cronbach alpha coefficient = 0.875 and all the variable in service quality have coefficients of Corrected item - Total Correlation are greater than 0.3 (FQA1 = 0.820, FQA2 = 0.574, FQA3 = 0.711 and TQA = 0.877), satisfactory inspection, ensure conditions for inclusion in the next model analysis.

#### 3.4.2. Reliability (Cronbach Alpha) for PATIENT SATISFACTION (PS) in Model of research for Private hospital:

The reliability coefficient, Patient satisfaction is bring to checks in the Cronbach alpha coefficient for the sixth construct of Patient Satisfaction (PS), Test results: Cronbach alpha coefficient = 0.938 and all the variable in PS have coefficients of Corrected item - Total Correlation are greater than 0.3 (Coefficients Corrected Item-Total Correlation of six construct of PS are DVa = 0.830; DVb = 0.811; DVc = 0.885; DVd = 0.815; DVe = 0.749 and DVf = 0.838), satisfactory inspection, ensure conditions for inclusion in the next model analysis.

### 3.5. Adjusted research model for Private hospital:

Through the above analysis results showed that 6 factors (components) of the original scale service quality after performing factor analysis, 02 factors not achieve that distinction is worth understanding and guarantee, worth four factors distinguish drawn, which were:

**Factor 1** (FQA1 - Reliability) includes the following 11 variables: IVA1, IVA2, IVA3, IVA4, IVA5, IVC1, IVC2, IVC4, IVD1, IVD3, IVD4.
**Factor 2** (FQA2 - Empathy) includes the following 4 variables: IVC3, IVD2, IVD5, IVE3
**Factor 3** (FQA3 - Tangibles) includes the following 3 variables: IVE1, IVE2, IVE4.
**Factor 4** (TQA – Technical Quality) includes the following 8 variables: IVF1, IVF2, IVF3, IVF4, IVF5, IVF6, IVF7, IVF8.

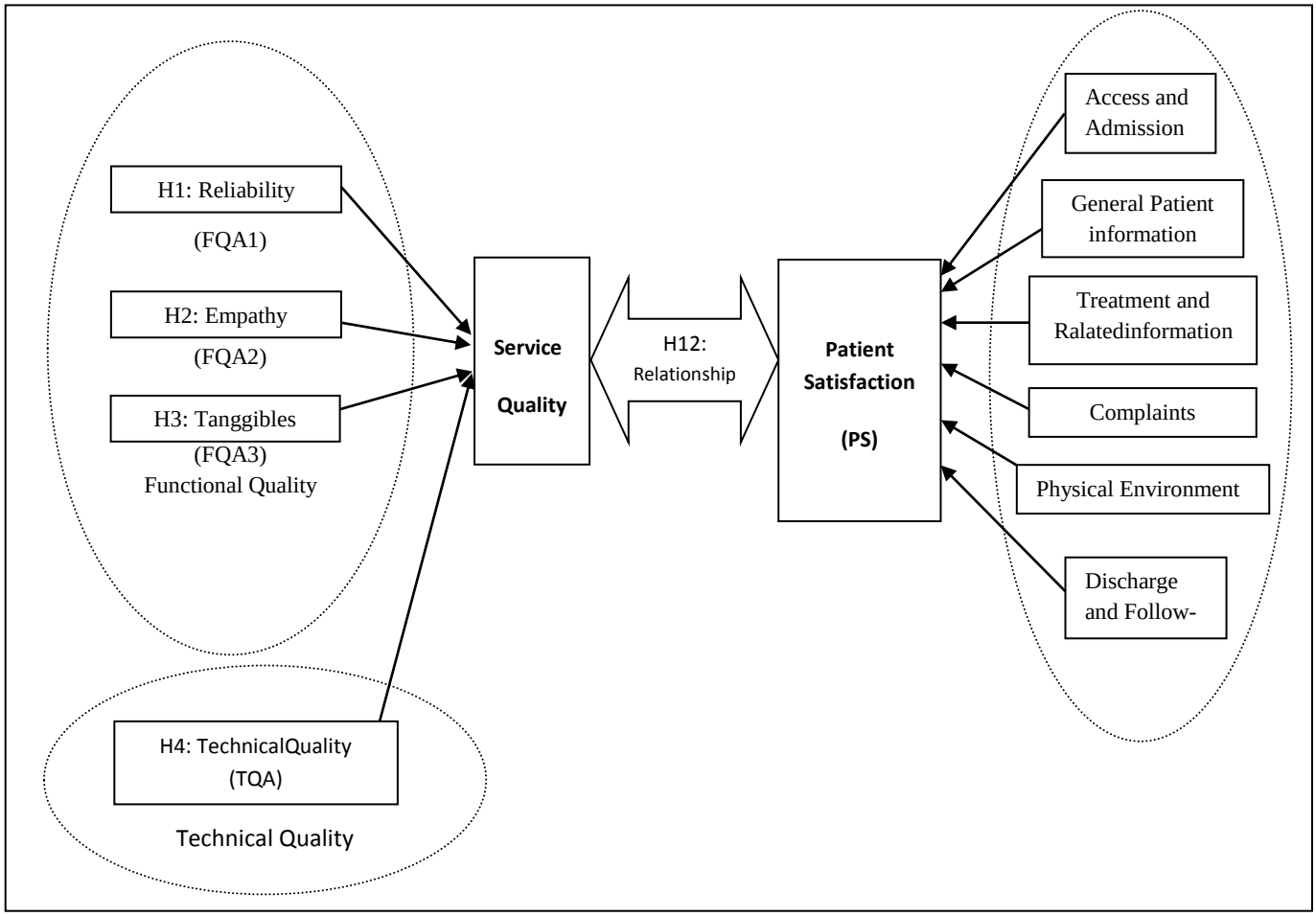
Two factor are Responsiveness factor and Assurance factor can theoretically exist, but when applied to the analysis of Outpatient Department at Private hospital achieved the distinction is not clear (it looks almost the same), did not become a separate element should be removed from the model.

Thus, the initial research model through factor analysis results are adjusted as follows (Table 1):

**Table 2: Summary of Hypotheses Findings in Private hospital:**

| | Hypothesis | Result |
|---|---|---|
| **Model of Service Quality (SQ) 4 factors** | **(H1):** There is a relationship between Reliability factor (FQA1) and Service quality (SQ) | Supported |
| | **(H2):** There is a relationship between Empathy factor (FQA2) and Service quality (SQ) | Supported |
| | **(H3):** There is a relationship between Tangibles factor (FQA3) and Service quality (SQ) | Supported |
| | **(H4):** There is a relationship Technical Quality factor (TQA) and Service quality (SQ). | Supported |
| **Model of Patient Satisfaction (PS) 6 factors** | **(H1a):** There is a relationship between "Access and Admission" (DVa) and Service quality (PS) | Supported |
| | **(H1b):** There is a relationship between "General patient information and Service Quality" (DVb) and Service quality (PS). | Supported |
| | **(H1c):** There is a relationship between "Related information" (DVc) and Service quality (PS). | Supported |
| | **(H1d):** There is a relationship between "Complaints management" factor (DVd) and Service quality (PS). | Supported |
| | **(H1e):** There is a relationship between "Physical Environment" (DVe) and Patient satisfaction (PS). | Supported |
| | **(H1f):** There is a relationship between "Discharge and Follow-up" (DVf) and Patient satisfaction (PS). | Supported |
| **Relationship between SQ and PS** | **(H12):** There is a relationship between Service Quality and Patient Satisfaction. | Supported |

**Figure 3: Adjusted research model in Private hospitals.**




### 3.6. CORRELATION BETWEEN SERVICE QUALITY (SQ) AND PTIENT SATISFACTION (PS):

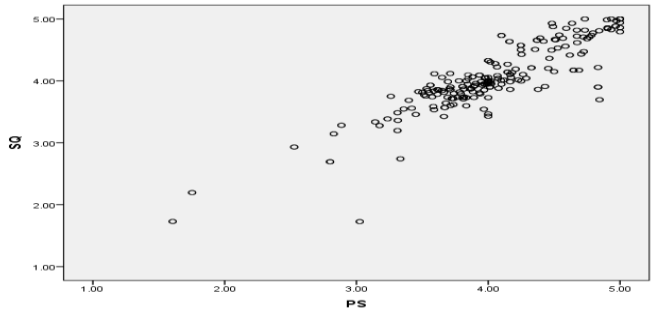
**Table 3: Correlation between Service Quality (SQ) and Patient Satisfaction (PS) in the Private hospital:**

| | | | | SQ | PS |
|---|---|---|---|---|---|
| SQ | Pearson Correlation | | | 1 | 0.881** |
| | Sig. (2-tailed) | | | | 0.000 |
| | N | | | 396 | 396 |
| | Bootstrap[b] | Bias | | 0 | 0.000 |
| | | Std. Error | | 0 | 0.017 |
| | | 95% Confidence Interval | Lower | 1 | 0.845 |
| | | | Upper | 1 | 0.913 |
| PS | Pearson Correlation | | | 0.881** | 1 |
| | Sig. (2-tailed) | | | 0.000 | |
| | N | | | 396 | 396 |
| | Bootstrap[b] | Bias | | 0.000 | 0 |
| | | Std. Error | | 0.017 | 0 |
| | | 95% Confidence Interval | Lower | 0.845 | 1 |
| | | | Upper | 0.913 | 1 |

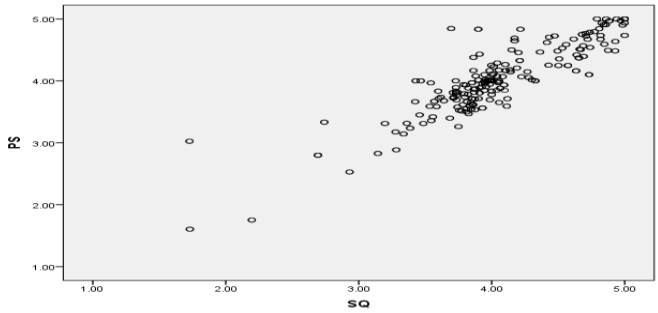
***Correlation is significant at the 0.01 level (2-tailed).*

[a]*Unless otherwise noted, bootstrap results are based on 1000 bootstrap samples*

**Figure 4: Correlation between Service Quality (SQ) and Patient Satisfaction (PS) in the Private hospital:**




```
GRAPH
  /SCATTERPLOT(BIVAR)=SQ WITH PS
  /MISSING=LISTWISE.
```




```
GRAPH
  /SCATTERPLOT(BIVAR)= PS WITH SQ
  /MISSING=LISTWISE.
```

**Table 4: Correlations between patient satisfaction (PS) and factors of service quality (SQ)**

| | | | | PS | FQA1 | FQA2 | FQA3 | TQA |
|---|---|---|---|---|---|---|---|---|
| | Pearson Correlation | | | 1 | 0.835** | 0.590** | 0.726** | 0.857** |
| | Sig. (2-tailed) | | | | 0.000 | 0.000 | 0.000 | 0.000 |
| | N | | | 396 | 396 | 396 | 396 | 396 |
| PS | Bootstrap[b] | Bias | | 0 | -0.001 | -0.002 | 0.000 | 0.001 |
| | | Std. Error | | 0 | 0.024 | 0.050 | 0.023 | 0.019 |
| | | 95% Confidence Interval | Lower | 1 | 0.778 | 0.491 | 0.679 | 0.818 |
| | | | Upper | 1 | 0.876 | 0.677 | 0.770 | 0.895 |
| | Pearson Correlation | | | 0.835** | 1 | 0.586** | 0.678** | 0.842** |
| | Sig. (2-tailed) | | | 0.000 | | 0.000 | 0.000 | 0.000 |
| | N | | | 396 | 396 | 396 | 396 | 396 |
| FQA1 | Bootstrap[b] | Bias | | -0.001 | 0 | -0.001 | 0.001 | 0.001 |
| | | Std. Error | | 0.024 | 0 | 0.043 | 0.028 | 0.024 |
| | | 95% Confidence Interval | Lower | 0.778 | 1 | 0.499 | 0.625 | 0.790 |
| | | | Upper | 0.876 | 1 | 0.663 | 0.732 | 0.888 |
| | Pearson Correlation | | | 0.590** | 0.586** | 1 | 0.425** | 0.595** |
| | Sig. (2-tailed) | | | 0.000 | 0.000 | | 0.000 | 0.000 |
| | N | | | 396 | 396 | 396 | 396 | 396 |
| FQA2 | Bootstrap[b] | Bias | | -0.002 | -0.001 | 0 | 0.000 | -0.001 |
| | | Std. Error | | 0.050 | 0.043 | 0 | 0.044 | 0.035 |
| | | 95% Confidence Interval | Lower | 0.491 | 0.499 | 1 | 0.333 | 0.521 |
| | | | Upper | 0.677 | 0.663 | 1 | 0.506 | 0.659 |
| | Pearson Correlation | | | 0.726** | 0.678** | 0.425** | 1 | 0.774** |
| | Sig. (2-tailed) | | | 0.000 | 0.000 | 0.000 | | 0.000 |
| | N | | | 396 | 396 | 396 | 396 | 396 |
| FQA3 | Bootstrap[b] | Bias | | 0.000 | 0.001 | 0.000 | 0 | -0.001 |
| | | Std. Error | | 0.023 | 0.028 | 0.044 | 0 | 0.024 |
| | | 95% Confidence Interval | Lower | 0.679 | 0.625 | 0.333 | 1 | 0.722 |
| | | | Upper | 0.770 | 0.732 | 0.506 | 1 | 0.821 |
| | Pearson Correlation | | | 0.857** | 0.842** | 0.595** | 0.774** | 1 |
| | Sig. (2-tailed) | | | 0.000 | 0.000 | 0.000 | 0.000 | |
| | N | | | 396 | 396 | 396 | 396 | 396 |
| TQA | Bootstrap[b] | Bias | | 0.001 | 0.001 | -0.001 | -0.001 | 0 |
| | | Std. Error | | 0.019 | 0.024 | 0.035 | 0.024 | 0 |
| | | 95% Confidence Interval | Lower | 0.818 | 0.790 | 0.521 | 0.722 | 1 |
| | | | Upper | 0.895 | 0.888 | 0.659 | 0.821 | 1 |

**. *Correlation is significant at the 0.01 level (2-tailed).*

b. *Unless otherwise noted, bootstrap results are based on 1000 bootstrap samples*

GRAPH
/SCATTERPLOT(BIVAR)=PS WITH SQ
/MISSING=LISTWISE.

**3.6. Inspection of model service quality research.**

**3.6.1. Inspection of model service quality research.**

**a/ Cronbach Alpha of Service Quality (SQ) of the Results in the Private hospital:**

The reliability coefficient, Quality service is bring to checks in the Cronbach alpha coefficient for the fourth construct of Service Quality (SQ), Test results: Cronbach alpha coefficient = 0.875 and all the variable in service quality have coefficients of Corrected item - Total Correlation are greater than 0.3 (FQA1 = 0.820, FQA2 = 0.574, FQA3 = 0.711 and TQA = 0.877), satisfactory inspection, ensure conditions for inclusion in the next model analysis.

**b/ Correlation analysis (Pearsom coefficient) for Private hospital**

The independent variable reliability, assurance, tangible media and technical quality are not correlated with each other because they are the factors that are estimated through factor analysis process.

The Dependent variables of Service Quality (SQ) for each independent variable are correlation with each other independent variables, through specific expressions of correlation coefficient as follows: FQA1 (0.888), FQA2 (0.696), FQA3 (0.842) and TQA (0.975) is calibrated (2-tailed) was statistically significant at the 0.01 level. Preliminarily we can conclude the independent variables included in the model can to explain the dependent variable of Patient satisfaction (PS).

Thus, summary of Hypotheses Findings in Private hospital is the initial research model through factor analysis results were adjusted as below (Table 2).

**3.6.2. Inspection of model service quality research.**

**a/ Cronbach Alpha of Patient Satisfaction (PS) of the Results in the Private hospital:**

The reliability coefficient, Quality service is bring to checks in the Cronbach alpha coefficient for the fourth construct of Service Quality (SQ), Test results: Cronbach alpha coefficient = 0.938 and all the variable in service quality have coefficients of Corrected item - Total Correlation are greater than 0.3 (FQA1 = 0.820, FQA2 = 0.574, FQA3 = 0.711 and TQA = 0.877), satisfactory inspection, ensure conditions for inclusion in the next model analysis.

The reliability coefficient, Patient satisfaction is bring to checks in the Cronbach alpha coefficient for the sixth construct of Patient Satisfaction (PS), Test results: Cronbach alpha coefficient = 0.938 and all the variable in PS have coefficients of Corrected item - Total Correlation are greater than 0.3 (Coefficients Corrected Item-Total Correlation of six construct of PS are DVa = 0.830; DVb = 0.811; DVc = 0.885; DVd = 0.815; DVe = 0.749 and DVf = 0.838), satisfactory inspection, ensure conditions for inclusion in the next model analysis.

**b/ Correlation analysis (Pearsom coefficient) for Private hospital**

The independent variable DVa, DVb, DVc, DVe, DVd, DVf are not correlated with each other because they are the factors that are estimated through factor analysis process.

The Dependent variables of Service Quality (SQ) for each independent variable are correlation with each other independent variables, through specific expressions of correlation coefficient (Cronbach's Alpha if Item Deleted) as follows: DVa (0.926), DVb (0.928), DVc (0.919), DVd (0.297), DVe (0.938), and DVf (0.924) is calibrated (2-tailed) was statistically significant at the 0.01 level. Preliminarily we can conclude the independent variables included in the model can to explain the dependent variable of Patient satisfaction (PS).

Thus, summary of Hypotheses Findings in Private hospital is the initial research model through factor analysis results were adjusted as below (Table 2).

**4. DISCUSSION**

These many items as Figure 2.1 were measured against five point Likert scale ranging from 1 = strongly disagree to 5 = strongly agree. The result show that patients feel that the quality of medical services at the hospital model is pretty good, but still not really good for the reception of the patients using the service at this hospital.

**4.1. Reliability (Cronbach Alpha) of Variable:**

***Reliability (Cronbach Alpha) of SERVICE QUALITY:***

As reliability of the instrument helps to provides consistency in the results and the Cronbach alpha is used to measure the reliability of the data (Soure: Green et al, 2000). Overall Cronbach Alpha of pravite hospital data along with service quality construct provides values greater than 0.60 (Reliability, Assurance, Empathy, Tangibles, and Techinical quality variables are 0.881, 0.839, 0.774, 0.829, and 0.942, respectively) as the values of Cronbach Alpha greater than 0.60 is acceptable (Source: Nunnally, 1978),[17-18] except one component's Responsiveness (IVB) dimension have reliability coefficient = 0.292 < 0.05 (Source: Nunnally, 1978) [17-18]

***Reliability (Cronbach Alpha) of PATIENT SATISFACTION:***

Cronbach Alpha for the firth construct **(Access and Admission: DVa),** the second construct **(General patient information: DVb),** the third construct **(Treatment and**

**Related information: DVc),** the fourth construct **(Complaints Management: DVd)**, the fifth construct **(Physical Environment: DVe)**, the sixth construct **(Discharge and Follow-up: DVf)** of public hospital are 0.883, 0.895, 0.896, 0.900, 0.912, and 0.896, respectively. As reliability of the instrument helps to provides consistency in the results and the Cronbach alpha is used to measure the reliability of the data (Green et al., 2000). Overall Cronbach Alpha of private data along with service quality construct provides values greater than 0.60, as the values of Cronbach Alpha greater than 0.60 is acceptable (Nunnally, 1978).

### 4.2. Exploratory Factor Analysis (EFA) for Private hospital

#### 4.2.1. CEA for SERVICE QUALITY:

Factor analysis discovered 4 EFA with quality service components: After performing factor analysis of Service quality (FQA1, FQA2, FQA3, TQA) with 26 variables as above (18 items of functional quality and 8 items of technical quality), we have 4 elements are drawn with KMO is > 0.5, the meaning that the sample size was adequate for the factor analysis technique, significant < 0.0001. Therefore suitable to conditions of factor analysis. Factors (FQA1, FQA2, FQA3, TQA) explained almost 74.294% with variance extracted. The rest could not be explained by the variables included in the analysis.[17-18]

As can be seen as below, the rotation converged in 4 iterations that were consistent with the framework the researchers had formulated in the current research thus this model was proven to be the most appropriate measurement for service quality for the current field of research. Thus factor analysis has demonstrated that the model is constructed form 4 major constructs defined as below (Demonstrating Rotated Component Matrix and Constructs of the Research): There are one dimension's Responsiveness (IVB) with 4 variables which IVB1, IVB2, IVB3, and IVB4 with load factor coefficient (Factor loading) is less than 0.5 will be remove. Thus, factor analysis has demonstrated that the model is constructed form 4 major constructs (Completed the demonstration of the component matrix factor rotation and structures of the study). After performing factor analysis, we have four elements are drawn:

**Factor 1** (FQA1 - Reliability) includes the following 11 variables (IVA1: IVA2: IVA3: IVA4, IVA5, IVC1, IVC2, IVC4, IVD1, IVD3, IVD4).
**Factor 2** (FQA2 - Empathy) includes the following 4 variables: **(**IVC3, IVD2, IVD5, IVE3).
**Factor 3** (FQA3 - Tangibles) includes the following 3 variables (IVE1, IVE2, IVE4).
**Factor 4** (TQA – Technical Quality) includes the following 8 variables (IVF1, IVF2, IVF3, IVF4, IVF5, IVF6, IVF7, IVF8).

#### 4.2.2. CEA for Patient Satisfactions (PS) of Private hospital:

Factor analysis discovered EFA with Patient Satisfaction Variable Group, and continues to performing Patient Satisfaction (dependent Variable are) analysis of 6 factor as above (DVa, DVb, DVc, DVd, DVe, DVf), we have 1 elements are drawn and obtained results (Table 3.2): KMO = 0.917 (>0.5), sig. = 0.000 (<0.05) in Bartlett's test of sphericity. Therefore suitable to conditions of factor analysis. One factor (Only one component was extracted) is drawn with variance extracted is 77.347% (Table 3.2). Thus factor analysis has demonstrated that the model is constructed form 6 major constructs defined in Table 3.2 (Demonstrating Rotated Component Matrix and Constructs of the Research).

As can be seen as above, the rotation converged in 6 iterations that were consistent with the framework the researchers had formulated in the current research thus this model was proven to be the most appropriate measurement for Patient Satisfaction for the current field of research.

#### 4.2.2. Correlation analysis (Pearsom coefficient):

The value of the dependent variable and the independent variable is the factor (factor score) was calculated through SPSS factor analysis, is the linear combination of the observed variables in the service quality as wel as patient satisfaction scale standardized.[17-18]

Multivariate regression analysis was performed to examine the relationship between the independent variable (Pearson correlation of the FQA1, FQA2, FQA3, and TQA factors are 0.820, 0.574, 0.711, and 0.877, respectively) with the dependent variable (Service quality) in research model. Cronbach alpha coefficient of PS is 0.875 and all the variable in PS have coefficients of Corrected item - Total Correlation are greater than 0.3, ensure conditions for inclusion in the next model analysis Before conducting linear regression analysis, the consideration of linear correlation between the independent variables and the dependent variables together is work to be done and the Pearson correlation coefficient in the matrix system correlation is appropriate to consider this relationship.[17-18]

Multivariate regression analysis was performed to examine the relationship between the independent variable (Pearson correlation of the Dva, DVb,, DVc, DVd, Dve, and DVf factors are 0.830, 0.811, 0.855, 0.815, 0.749, and 0.838 respectively) with the dependent variable (Patient satisfaction) in research model. Cronbach alpha coefficient of PS is 0.938 and all the variable in PS have coefficients of Corrected item - Total Correlation are greater than 0.3, ensure conditions for inclusion in the next model analysis. Before conducting linear regression analysis, the consideration of linear correlation between the independent variables and the dependent variables together is work to be

done and the Pearson correlation coefficient in the matrix system correlation is appropriate to consider this relationship.[17-18]

Specify, Multivariate regression analysis was performed to examine the relationship between the independent variable (Pearson correlation of the FQA1, FQA2, FQA3, and TQA factors are 0.820, 0.574, 0.711, and 0.877, respectively) with the dependent variable (Patient satisfaction) in research model, ensure conditions for inclusion in the next model analysis, the result showed that the correlation with R = 0.881 (sig. = 0.0001), the meaning that, there are very strongly positive relationship between SQ and PS and relationship . Preliminarily we can conclude the independent variables included in the model can to explain the dependent variable of Patient satisfaction (PS) and we can demonstrate relationship between SQ and PS in the measuring healthcare service quality, it's strongly positive correlation.[17-18]

### 4.3. Cronbach Alpha of factor and Model for Private hospital:

#### 4.3.1. Reliability (Cronbach Alpha) for SERVICE QUALITY (SQ) in Model of research for Private hospital:

The reliability coefficient, Quality service is bring to checks in the Cronbach alpha coefficient for the fourth construct of Service Quality (SQ), Test results: Cronbach alpha coefficient = 0.875 and all the variable in service quality have coefficients of Corrected item - Total Correlation are greater than 0.3 (FQA1 = 0.820, FQA2 = 0.574, FQA3 = 0.711 and TQA = 0.877), satisfactory inspection, ensure conditions for inclusion in the next model analysis.

#### 4.3.2. Reliability (Cronbach Alpha) for PATIENT SATISFACTION (PS) in Model of research for Private hospital:

The reliability coefficient, Patient satisfaction is bring to checks in the Cronbach alpha coefficient for the sixth construct of Patient Satisfaction (PS), Test results: Cronbach alpha coefficient = 0.938 and all the variable in PS have coefficients of Corrected item - Total Correlation are greater than 0.3 (Coefficients Corrected Item-Total Correlation of six construct of PS are DVa = 0.830; DVb = 0.811; DVc = 0.885; DVd = 0.815; DVe = 0.749 and DVf = 0.838), satisfactory inspection, ensure conditions for inclusion in the next model analysis.

### 4.4. Multiple Linear Regression analysis (Pearsom coefficient):

❖ ***Summary of Hypotheses Findings in Public hospital:***

Thus, the initial research model through factor analysis results are adjusted as Figure 3 (Figure 3's Model summary of service quality in private hospital)

### 4.5. Relatioship analysis between Service Quality (SQ) and Patient Satisfaction (PS) at private hospital:

Multivariate regression analysis was performed to examine the relationship between the independent variable reliability, assurance, tangible media and digital quality with the dependent variable satisfaction with service quality in research model. Before conducting linear regression analysis, the consideration of linear correlation between the independent variables and the dependent variable between the independent variables together is work to be done and the Pearson correlation coefficient in the matrix system correlation is appropriate to consider this relationship.

The value of the dependent variable and the independent variable is the factor (factor score) was calculated through SPSS factor analysis, is the linear combination of the observed variables in the service quality scale standardized. The independent variable reliability, assurance, tangible and technical quality are not correlated with each other; because they are the factors that are estimated through factor analysis process.

Dependent variables of Service quality (SQ) for each independent variable no correlation with each other, through specific expressions of correlation coefficient as follows: DVa (0.820), DVb (0.802), DVc (0.820), DVd (0.738), DVe (0.729), DVf (0.747) is calibrated (2-tailed) was statistically significant= 0.0001. Preliminarily we can conclude the independent variables included in the model can to explain the dependent variable satisfaction (SQ)

Dependent variables of patient satisfaction (PS) for each independent variable (Table 4) have correlation with each other, through specific expressions of correlation coefficient as follows: FQA1 (0.835), FQA2 (0.590), FQA3 (0.728), TQA (0.857) is calibrated (2-tailed) was statistically significan = 0.0001. Preliminarily we can conclude the independent variables included in the model can to explain the dependent variable satisfaction (PS).[17],[18]

Multivariate regression analysis was performed to examine the relationship between the dependent variable's Service quality (SQ) with independent variable's Patient Satisfaction (PS) have correlation with each other (correlation coefficient each other = 0.881) was statistically significan = 0.0001.

Thus, Service quality directly and positively influences patient satisfaction, (H12) hypothesis is supported.

Therefore, the study was completed to demonstrate that have strongly positive relationship between healthcare service quality (SQ) and patient satisfaction (PS) in the new model of research, ensure method of mesuring quality by new tool's base on customer expectation. The manager and reseachs can used to the new model of research which we

were suggest, it's the ensure method of measuring healthcare sevice quality with high significant.

## 5. CONCLUSION

The results of the measurement model shows, and after additional adjustment, the scale will achieve reliability and enable value (the result of this model is SERVQUAL scale of the functional quality and scale of the technical quality of service quality). The models of service quality in private hospitals is strongly affected by different factors.

The firth method's Measuring healthcare quality by functional and technical quality; The functional quality by SERQUAL intrument with 5 items (22 score) and Technical quality with item (8 score). After performing factor analysis and adjusted research model for the public hospital, we have four main factors are Reliability (FQA1) with 11 variables, Embathy (FQA2) with 4 variables, Tangible (FQA3) with 3 variables, and Technical quality(TQA) had 8 variables. The second method's measuring healthcare by Tool of VPSM with 6 origin dimensions (25 score). After performing factor analysis and adjusted research model for the public hospital by Tool of VPSM, we have six main factors are Access and Admission Index (DVa), General Patient Information Index (DVb), Treatment and Related Information Index (DVc), Complaints Management Index (DVd), Physical Environment Index (DVe), Discharge and Follow-up Index (DVf).

There is a strongly positive relationship (R=0.881) between patient satisfaction (PS) and service quality (SQ) with high significant (statistically significan = 0.0001), ensure method of mesuring healthcare service quality by new tool's base on customer expectation.

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