

# MEASURING SERVICE QUALITY FOR MEDICAL EXAMINATION AT A NATIONAL PUBLIC HOSPITAL IN VIETNAM BY TOOLS OF THE VICTORIAN PATIENT SATISFACTION MONITOR

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## ABSTRACT

**Objective:** A survey was conducted for outpatient satisfaction in Bachmai Hospital using the Tools of the Victorian Patient Satisfaction Monitor (VPSM) 2012 to address the patient satisfaction (PS) of hospital service quality.

**Subject and method:** The study obtained feedback from patients from December 2013 to January 2014. When the patients could not be interviewed, the attendant, a modified version of the Patient Satisfaction by the VPSM with 6 items (25 score) was used in General Clinic Department at Bachmai Hospital in Vietnam.

**Result:** In total, 550 people were interviewed and 513 patients completed the survey. Levels of customer satisfaction about service quality were influenced by the VPSM with 6 items (25 score) and Cronbach alpha coefficient's 0.932, Including the (1) Access and Admission, (2) General Patient information, (3) Treatment and Related information, (4) Complaints Management, (5) Physical Environment, (6) Discharge and Follow-Up, with highly Corrected Item-Total Correlation of six constructs of patient satisfaction (from 0.721 to 0.884). Overall, the level of high patient satisfaction in BachMai hospital was explained at almost 65% of what could be achieved. There was no difference in the assessment of the service quality for medical examination with gender, level of education, the monthly income level or with the model of research.

**Conclusions:** Adjusted research model for the hospital has sixth constructs of levels of customer satisfaction about service quality is influenced by the VPSM with 6 items (25 score). The VPSM provides feedback on the service quality for medical examination of a public hospital experience from the adult outpatient perspective at the developing nation of Vietnam.

**Keywords:** Service quality, medical examination, patient satisfaction, VPSM

## 1.0 Introduction

### 1.1. Introduction of the modeled hospital

Bachmai Hospital is the significant Public general hospital in Vietnam, one of the biggest hospitals in Vietnam. Although Vietnam is now a developing country [1], [2], Bachmai Hospital has combined advanced technology systems and expert resources in healthcare and medical practice education in Vietnam.

Bachmai Hospital is a multi-field medical facility in Hanoi and is considered one of the largest in Vietnam. The hospital was established in 1911. The hospital has provided healthcare service to 7.000 - 8.000 patients per day (about more than 2,000 patients visits per day to tht clinic departments at Bachmai hospital). Currently, Bachmai Hospital has over 3,100 staff members (including nearly 700 doctors and more than 2500 are nursing and other staff members).

### 1.2. Introduction of the Victorian Patient Satisfaction Monitor

Victorian Patient Satisfaction Monitor (VPSM) is a study that asks patients to tell how they felt about their stay in the hospital [3], [4]. The continuous monitor of patient satisfaction has been required by Victorian Government as a commitment to improve the public healthcare system [3], [4]. The results are crucial for quality managers to direct the improvement and change in healthcare service.

As VPSM proved to be a great impact on the improvement of healthcare system, we applied that model to measure outpatient satisfaction in Bachmai Hospital. After analysis, we proposed suggestions to improve the medical service quality.

## 2.0 Methods

### 2.1. Study Area

Patients who were examined in the General clinic department at Bachmai General Hospital.

### 2.2. Selection of Respondents

Patients in the outpatient clinic at Bachmai Hospital were chosen for the survey.

Selection of study set and sampling of patients:

$$n = \frac{N \times Z_{\alpha/2}^2 \times p \times q}{\epsilon^2 \times (N - 1) + Z_{\alpha/2}^2 \times p \times q}$$

Where N is the population size,  $p = 1 - q$  represents the yes/no categories,  $Z_{\alpha/2}$  is CDF of normal distribution and finally  $\epsilon$  is the error term. Since we have  $p = 0.5$ ,  $Z_{\alpha/2} = 1.96$  and  $\epsilon = 0.05$ . The results confirmed that the number of questionnaire is sufficient for this survey [5].

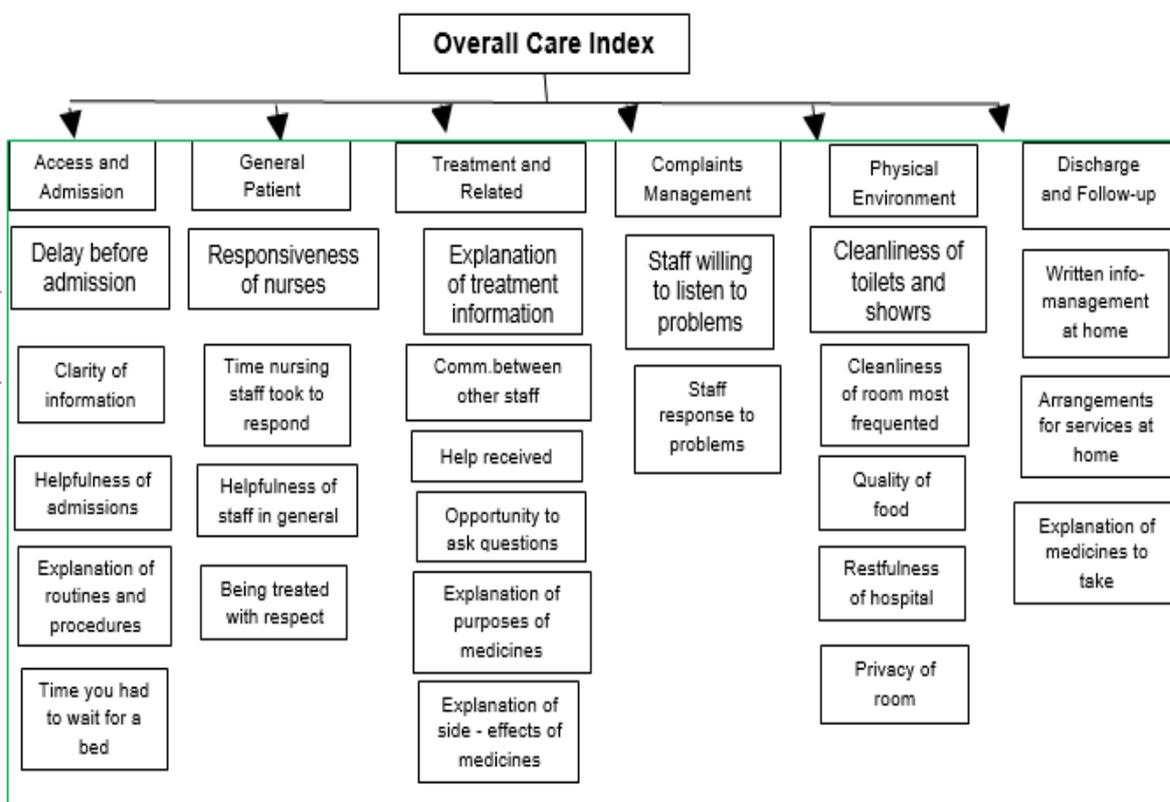
For the research in Clinic department at Bachmai hospital, where considering a population of 120,000 patients for two months at Bachmai Hospital (about over 2,000 patients visit per day to Clinic department at Bachmai hospital) with selection value of  $p = 0.5$ , a level of confidence's 95% and  $\epsilon = 0.05$  confidence interval, the minimal sample was calculated as 373. Therefore, for the present research, based on the estimated population size of 373, a minimum sample size of 373 would represent the population and the results of the present research sample can be safely generalized to the population. In the current research, a sample of 513 individuals was collected.

**2.3. Tools of Victorian patient satisfaction monitor**

Measuring service quality for medical examination by Tools of VPSM (2012) contains six dimensions with 25 items: Each item can be scored from 1 to 5. This six aspects are: Access and Admission with 5 items, General Patient Information with 4 items, Treatment and Related Information with 6 items, Complaint Management with 2 items, Physical Environment with 5 items, Discharge and Follow-up with 3 items (Figure 1) [3], [4].

The scores of 25 surveyed items were used to calculate the Overall Care Index (OCI). The OCI acts as the global indicator for the patient's hospital experience.

**Figure 1.** VPSM indices and items (Source: VPSM Annual Report 2012-12) [3], [4]



(Source: VPSM Annual Report 2012–12) [3-4]

### 2.3.1. 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 points Likert scale. Number 1 implies SD - Strongly Disagree, 2 implies D - Disagree, 3 implies N – Neither disagree or agree, 4 implies A – Agree, 5 implies SA – Strongly agree [5].

#### *Variables for research:*

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

- Patient Satisfaction (PS) in Service quality (PS) is dependent variables (DV).
- 6 dimensions of Patient Satisfactions are independent variables (IV) of Patient satisfaction (DV). Measuring Patient satisfaction by 6 dimensions are: (1) Access and Admission (DVa: 5 variables), (2) General Patient information (DVb: 4 variables), (3) Treatment and Related information (DVc: 6 variables), (4) Complaints Management (DVd: 2 variables), (5) Physical Environment (DVe: 5 variables), and (6) Discharge and Follow-up (DVf: 3 variables).

##### + *Demographic Variables (DM):*

- DM1: Gender (0 = male, 1 = female):
- DM2: Level of Education (0 = undergraduate, 1 = Degree, 2 = masters, 3 = doctorate):
- DM3: Income Level: Monthly income (0 = under 200 USD, 1=201 to 500 USD, 2 = 501 to 1000 USD, 3 = 1001 to 2000 USD, 4 = above 2000 USD).

### 2.3.2. Research Hypotheses

For the purpose of this research, we argue the VPSM indexes are reliable and all six dimensions of patient satisfaction in service quality by the VPSM instrument are significant in the setting of health care.

- H1a (Hypothesis 1a): There is a relationship between "Access and Admission" and "Service Quality".
- H1b (Hypothesis 1b): There is a relationship between "General Patient information" and "Service Quality".
- H1c (Hypothesis 1c): There is a relationship between "Treatment and Related information" and "Service Quality".
- H1d (Hypothesis 1d): There is a relationship between Complaints Management and Service Quality.
- H1e (Hypothesis 1e): There is a relationship between "Physical Environment" and "Service Quality".
- H1f (Hypothesis 1f): There is a relationship between "Discharge and Follow-up" and "Service quality".

From the analysis, some suggestions were proposed to improve the quality of healthcare, ensure patient satisfaction for general clinic department at Bach Mai Hospital.

**Analysis of variance (ANOVA):**

One-way ANOVA was performed to find a difference in the quality assessment of healthcare services according to demographic variables (gender, level of education, income level), with these assumptions:

(H3a): There is a difference in satisfaction levels between the gender groups

(H3b): There is a difference in satisfaction levels between the level of education groups

(H3c): There is a difference in satisfaction levels between the monthly income level

**2.3.3. Questionnaire administration**

Questionnaires were completed by outpatients at the Bachmai Hospital (n= 513) over a period of one month.

All Data analysis has been carried out with the Statistical Package for Social Sciences (IBM SPSS 21.0) [6], [7].

**3.0 Result**

From the samples characteristics in the Public hospital: 550 questionnaires were distributed, the rate of completion is 93.27% (n = 513). There is a 513 questionnaire are completed, frequency distribution of gender in the hospital are 220 males (42.9%) and 293 females (57.1%).

**3.1. Reliability (Cronbach Alpha) and average of Patient Satisfaction Variables**

Basically, patients were satisfied, to some extent. Variables DVa, DVb, DVc, DVe, and DVf were the variables used in this study to measure patient satisfaction. These many items as in Figure 1 were measured againsts five point Likert scale ranging from 1 = strongly disagree to 5 = strongly agree. The reliability coefficient, Cronbach Alpha for these construct of the private hospital are 0.897, 0.878, 0.916, 0.929, 0.893, and 0.853 respectively (Table 1).

**Table 1:** Descriptive Statistics of the Patient Satisfaction in the BachMai hospital

Dimensions		N	Mean ± SD	Reliability (Cronbach Alpha)
1	Access and Admission (Dva)	513	3.7010 ± 0.69755	0.897
2	General Patient information (DVb)	513	3.8007 ± 0.70667	0.878
3	Treatment and Related information (DVc)	513	3.8648 ± 0.63978	0.916
4	Complaints Management (DVd)	513	3.8382 ± 0.83394	0.929
5	Physical Environment (DVe)	513	3.6074 ± 0.71241	0.893
6	Discharge and Follow-up (DVf)	513	3.8941 ± 0.63417	0.853

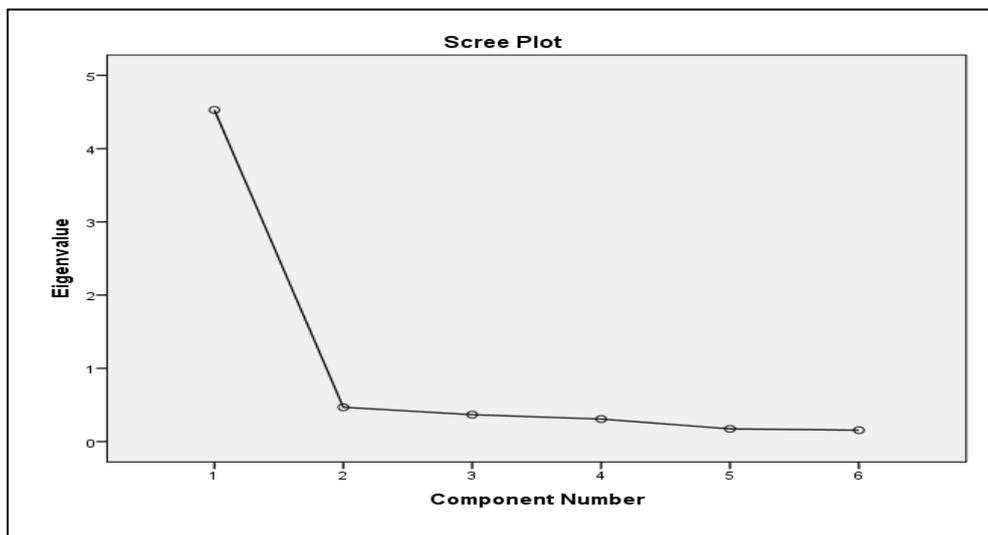
### 3.2. Exploratory Factor Analysis (EFA) for patient satisfaction of public hospital

**Table 2:** EFA of Patient Satisfaction (PS) of the Results in the BachMai hospital

<b>Table 2.1. Total Variance Explained</b>						
Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	4.527	75.456	75.456	4.527	75.456	75.456
2	0.468	7.805	83.260			
3	0.368	6.128	89.389			
4	0.307	5.122	94.511			
5	0.174	2.896	97.407			
6	0.156	2.593	100.000			
Extraction Method: Principal Component Analysis.						
<b>Table 2.2. KMO and Bartlett's Test</b>						
<b>Kaiser-Meyer-Olkin Measure of Sampling Adequacy</b>				0.905		
	Bartlett's Test of Sphericity	Approx. Chi-Square		2565.959		
		Df		15		
		Sig.		0.000		
Extraction Method: Principal Component Analysis.						
<b>Table 2.3. Component Matrix<sup>a</sup></b>						
	Items	Component				
	Dva	1				
	DVb	0.893				
	DVc	0.904				
	DVd	0.925				
	DVd	0.869				

	DVe	0.809
	DVf	0.804
Extraction Method: Principal Component Analysis.		
a. 1 components extracted.		
<b>Rotated Component Matrix<sup>a</sup>:</b>		
a. Only one component was extracted. The solution cannot be rotated.		

**Figure 2:** Component Number of Patient satisfaction



After performing EFA of 6 components (25 score), we have one component extracted with six factors (25 score) are drawn (DVa, DVb, DVc, DVd, DVe, DVf) (Table 2 and Figure 2).

### 3.3. Cronbach alpha of factor and Model for Bachmai Hospital

#### Cronbach alpha of factor and the model:

**Table 3:** Cronbach Alpha of Patient Satisfaction (PS) of the Results in the Bachmai hospital

Item-Total Statistics				
Items	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
DVa	19.0052	9.383	0.836	0.915
DVb	18.9055	9.262	0.855	0.912

DVc	18.8414	9.537	0.884	0.910
DVd	18.8680	8.766	0.806	0.921
DVe	19.0988	9.685	0.733	0.928
DVf	18.8121	10.129	0.721	0.929

**Note.** Reliability statistics of PS (n=6) had Cronbach's Alpha = 0.932

The reliability coefficient for patient satisfaction was calculated based on the Cronbach alpha coefficient for the six variables of patient satisfaction, as can be seen in Table 3: Cronbach alpha coefficient = 0.932 and all the variable in patient satisfaction have coefficients of Corrected item-Total Correlation are greater than 0.3 (Coefficients Corrected Item-Total Correlation of six constructs of patient satisfaction are DVa = 0.836, DVb = 0.855, DVc = 0.884, DVd = 0.806, DVe = 0.733, and DVf = 0.721), satisfactory inspection, thereby ensuring conditions for inclusion in the next model analysis.

### 3.4. Adjusted research model and hypothesis for Public hospital

Through the above analysis results showed that 6 factors (components) of the original scale patient satisfaction after performing factor analysis, worth six factors distinguish drawn, which were six components (six factors) as above (Table 3): Factor 1 (DVa component – Access and admission) had 5 variables (DVa1, DVa2, DVa3, DVa4, DVa5), Factor 2 (DVb component – General patient information) had 4 variables (DVb1, DVb2, DVb3, DVb4), Factor 3 (DVc component – Treatment and related information) had 6 variables (DVc1, DVc2, DVc3, DVc4, DVc5, DVc6), Factor 4 (DVd component – Complaints management) had 2 variables (DVd1, DVd2), Factor 5 (DVe component – Physical Environment) had 5 variables (DVe1, DVe2, DVe3, DVe4, DVe5), and Factor 6 (DVf component – Discharge and Follow-up) had 3 variables (DVf1, DVf2, DVf3). That ensures conditions for adjusted research model and hypothesis as follows (**Figure 2 and Table 4**).

**Table 4:** Summary of Hypotheses Findings in the hospital

Hypothesis	Result
<b>(H1a):</b> There is a relationship between “Access and Admission” (DVa) and Service quality (PS)	Supported
<b>(H1b):</b> There is a relationship between “General patient information and Service Quality” (DVb) and Service quality (PS).	Supported
<b>(H1c):</b> There is a relationship between “Related information” (DVc) and Service quality (PS).	Supported
<b>(H1d):</b> There is a relationship between “Complaints management” factor (DVd) and Service quality (PS).	Supported

<b>(H1e):</b> There is a relationship between “Physical Environment” (DVe) and Service quality (PS).	Supported
<b>(H1f):</b> There is a relationship between “Discharge and Follow-up” (DVf) and Service quality (PS).	Supported

Thus, the initial research model through factor analysis results are adjusted in **Table 4**.

### 3.5. Multiple linear regression analysis (Pearson coefficient)

**Table 5:** Linear regression of patient satisfaction about Service Quality of the Results in the hospital

Coefficients <sup>a</sup>						
Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	7.438E-15	0.000		0.0	0.0
	DVa	0.167	0.000	0.190	0.0	0.0
	DVb	0.167	0.000	0.193	0.0	0.0
	DVc	0.167	0.000	0.175	0.0	0.0
	DVd	0.167	0.000	0.227	0.0	0.0
	DVe	0.167	0.000	0.194	0.0	0.0
	DVf	0.167	0.000	0.173	0.0	0.0

a. Dependent Variable: PS

Thus, the multiple linear regression analysis (Pearson coefficient) of patient satisfaction about service quality of the results in the hospital (Table 5) as follow:

$$Y = 7.438E-15 + 0.167*DVa + 0.167*DVb + 0.167*DVc + 0.167*DVd + 0.167*DVe + 0.167*DVf$$

### 3.6. Analysis of variance (ANOVA) for Public hospital

The result of the analysis of variance ANOVA gender, ANOVA education, ANOVA income level indicated that *F* value had no significant with Sig. = 0.742, Sig. = 0.182, and Sig. = 0.916, respectively (Greater than 0.05). Thus, it had no significant difference in patient satisfaction between different genders, education groups, and income level groups. Thus, (H3a) hypothesis, (H3b) hypothesis, and (H3c) hypothesis are rejected.

## 4.0 Discussion

### 4.1 Reliability (Cronbach Alpha) of Variable

Reliability of the instrument helped to provide consistency in the results and the Cronbach alpha was used to measure the reliability of the data. Overall Cronbach Alpha of public hospital data along with service quality construct provided values greater than 0.60 (Table 1), which is acceptable [8], [9].

### 4.2. Exploratory Factor Analysis (EFA) for patient satisfaction of public hospital

Factor analysis discovered 6 EFA with patient satisfaction variable group. All items have coefficient is less than 0.05, so there are no variables would be remove.

After performing factor analysis of 25 variables as above, there are no variables of 25 items were removed, we have 6 elements are drawn as follows: DVa, DVb, DVc, DVd, DVe, DVf). KMO = 0.905 is  $> 0.5$  (Table 2), meaning that the sample size was adequate 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 of sphericity should be significant =  $0.000 < 0.05$  (Table 2). Therefore, it is suitable for the conditions of factor analysis. One factor (Only one component was extracted) is drawn with variance extracted is 75.456% (Table 2) [7], [8].

The meaning that 6 factors (DVa, DVb, DVc, DVd, DVe, DVf) explained almost 75.456% with variance extrated. The rest could not be explained by the variables included in the analysis. As can be seen in Table 2 indicated that the rotation converged in 6 iterations that were consistent with the framework the researchers had formulated in the current research. Therefore, this model was proven to be the most appropriate measurement for patient satisfaction for the current field of research. Thus factor analysis has demonstrated that the model is constructed form 6 major constructs defined in Table 2 and Figure 2 (Demonstrating rotated component matrix and constructs of the research) [7], [8].

After performing factor analysis with 25 variables as above, we have six elements are drawn:

Factor 1 (DVa – Access and admission): includes the following 5 variables: DVa1 (Delay before admission), DVa2 (Clarity of information), DVa3 (Helpfulness of admissions), DVa4 (Explanation of routine and procedures), and DVa5 (Time you had to wait for a bed).

Factor 2 (DVb – General patient information): includes the following 4 variables: DVb1 (Responsiveness of nurses), DVb2 (Time nursing staff took to respond), DVb3 (Helpfulness of staff in general), and DVb4 (Being treated with respect).

Factor 3 (DVc – Treatment and related information): includes the following 6 variables: DVc1 (Explanation of treatment information), DVc2 (Comm. between other staff), DVc3 (Help received), DVc4 (Opportunity to ask questions), DVc5 (Explanation of purposes of medicines), and DVc6 (Explanation of side – effects of medicines).

Factor 4 (DVd – Complaints management): includes the following 2 variables: DVd1 (Staff willing to listen to problems), and DVd2 (Staff response to problems).

Factor 5 (DVe – Physical Environment): includes the following 5 variables: DVe1 (Cleanliness of toilets and showers), DVe2 (Cleanliness of room most frequented), DVe3 (Quality of food), DVe4 (Restfulness of hospital), and DVe5 (Privacy of room).

Factor 6 (DVf – Discharge and Follow-up): includes the following 3 variables: DVf1 (Written info-management at home), DVf2 (Arrangements for services at home), and DVf3 (Explanation of medicines to take).

As can be seen in **Table 2**, 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 (**Table 2**).

#### ***4.3. Cronbach Alpha of factors and Adjusted research model for hospital***

The reliability coefficient, Patient satisfaction is brought to checks in the Cronbach alpha coefficient for the sixth construct of Patient Satisfaction (PS), Test results (**Table 3**) were showed that Cronbach alpha coefficient = 0.932 and all the variable in PS have coefficients of Corrected item - Total Correlation is greater than 0.3 (Coefficients Corrected Item-Total Correlation of six construct of PS are DVa = 0.836; DVb = 0.855; DVc = 0.884; DVd = 0.806; DVe = 0.733 and DVf = 0.721), Thus, that ensures conditions for inclusion in the next model analysis.

#### ***4.4. Adjusted research model and hypothesis for a public hospital***

Through the above analysis results showed that 6 factors (components) of the original scale service quality after performing factor analysis, worth six factors distinguish drawn, which were the initial research model through factor analysis results are adjusted as follows (Table 4)

Summary of hypotheses findings in public hospital by VPSM tool: The initial research model through factor analysis results are adjusted as showed in **Table 4**.

In fact, Australian as a developed country, has used the VPSM tool with 6 items (25 scores) and many developed countries have used the tool. That evidence confirmed that the VPSM is a strong tool in the measurement of service quality by levels of customer satisfaction [2], [3], [4]. Our research utilized the tool of VPSM in developing countries as Vietnam, showing that the VPSM can become a strong tool when applying for the developing countries [1], [2]. We can use it in measuring service quality and medical examination in most countries include developed and developing countries [2].

#### 4.5. Multiple linear regression analysis (Pearson coefficient)

The regression equation best satisfaction of quality of service as follow (Table 5):

$$Y = Y = 7.438E-15 + 0.167* \text{ Access and Admission (DVa)} + 0.167* \text{ General patient information and Service Quality (DVb)} + 0.167* \text{ Related information (DVc)} + 0.167* \text{ Complaints management (DVd)} + 0.167* \text{ Physical Environment (DVe)} + 0.167* \text{ Discharge and Follow-up (DVf)}$$

The analysis indicated that Six factors with regression coefficient as the same = 0.167, the meaning that the influence of factors are the same level; although the model had beta of Standardized Coefficients's other different between variables.

In the hospital, this is the most powerful factor which strongly influences the quality of medical examination as well as the healthcare service and in turn customer satisfaction. This is also the score element of satisfaction with medical care, the hospital should promote this, and doctors need better skills to continuously improve in this qualification [9].

The staff of the hospital departments should also enhance professional and service attitude to better ensure service capacity associated with the customer's interests. These are also very important factors that hospital management need to attend to in the construction of the development strategy; therefore, the management of the hospital needs to focus more on investing in upgrading medical equipment, upgrading working environment and admission systems, as well as expanding the size of the hospital, especially, in the medical examination area. That will ensure a good hospital environment. The hospital administration needs to organize counselling to patients before they arrive at the hospital and follow the clients' progress when they are at home. Thus, the service healthcare in the hospital will be harmonious aspects for all dimensions (Table 5).

#### 4.6. Analysis of variance ANOVA for Public hospital

Group theory about the difference in quality evaluation of healthcare services quality according to demographic variables (gender, level of education, income level). After analysis of variance (ANOVA) for the Public hospital, results of the analysis of variance ANOVA gender, education groups, and income level groups showed that three hypotheses (H3a, H3b, H3c) are rejected, meaning that researchers could see the no difference in the assessing of the service quality respectively under "gender", between the "level of education" and between "monthly income level" in the model of the public hospital. Thus, the service will be suitable for all customer groups.

## 5.0 Conclusion

This outpatient satisfaction survey by tools of the VPSM is the first of its kind for public hospitals in Vietnam; Research indicated the levels of customer satisfaction about service quality which is influenced by the VPSM with 6 items (25 scores): Access and Admission, General Patient information, Treatment and Related information, Complaints, Management, Physical Environment, and Discharge and Follow-Up dimension. Therefore, we hope that the

Tool of VPSM can be used for measuring the quality of medical examination as well as service quality in many countries including developed and developing countries. While the survey revealed depressing feedback, the motivation of the senior management to indentify areas of concern and measure patient satisfaction is a step in the right direction. There would not be any scope to improve the services unless such bold steps at measuring client satisfaction are pursued. Perhaps, repeating such studies at regular intervals, either once per month or per three months or per year will be a useful guide for material intervention in development strategy.

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