

THE NEW TOOL AND RELATIONSHIP BETWEEN SERVICE QUALITY AND INPATIENT SATISFACTION IN MEASURING HEALTHCARE QUALITY

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ABSTRACT

Objective: The aim of this study to demonstrate that have correlation between healthcare service quality (SQ) and inpatient satisfaction (PS/IPS) with significant through the new model of research, ensure method of measuring quality by new tool's base on customer expectation.

Subject and method: The study obtained feedback from inpatients, 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 combine with the 8 dimensions for technical quality; Beside, measure inpatients satisfaction by Tool of Victorian Patient Satisfaction Monitor (VPSM) with 6 origin dimensions (25 scores instruments). Survey on Vietnam National Heart Institute at Bachmai Hospital in Vietnam. The study refers to the period one month from January to February 2014.

Result: Altogether 325 inpatients were interviewed and identified by stratified random sampling. Most inpatients whose length of stay in Vietnam National Heart Institute in the Bachmai hospital. The first method's Measuring healthcare quality by functional and technical quality; The functional quality by SERVQUAL instrument with 5 items (22 score) and Technical quality item (8 score). After performing factor analysis, we have six elements are drawn: Reliability (IVA) with 5 variables, Responsiveness (IVB) with 4 variables, Assurance (IVC) with 4 variables, Empathy (IVD) with 5 variables, Tangible (IVE) with 5 variables, and Technical quality(IVF) had 8 variables with highly Corrected Item-Total Correlation of IPS and reliability coefficient. 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 $R = 0.834$ ($p < 0.0001$).

Conclusion: There is a strongly positive relationship between patient satisfaction (PS) and service quality (SQ) with high significant, ensure method of measuring healthcare service quality by new tool's base on customer expectation.

Keywords: Measuring Healthcare quality, Relationship, Service quality, Inpatient Satisfaction.

1. INTRODUCTION

Bachmai Hospital is the significant public general hospital in Vietnam: Bachmai Hospital is one of the biggest hospital in Vietnam. Although Vietnam is now a developing country [1], [2], Bachmai Hospital has combined advanced technology system and expertise resource in healthcare and medical practice education on the top in Vietnam. Bachmai Hospital is a multi-field medical facility in Hanoi and is considered on of the largest in Vietnam. The hospital was established in 1911. Vietnam National Heart Institute is one big unit belong to Bachmai Hospital, from an unit of Bachmai hospital with only 50 sickbeds, after 25 years, the institute has become one of top hospitals in the north in particular and in Vietnam in general, with application of advanced and low-cost medical techniques, such as transcatheter aortic valve implantation or percutaneous coronary intervention, that have saved thousands of patients suffering from fatal heart diseases in the northern region of Vietnam. Currently, Vietnam National Heart Institute also developed completely with over 300 staffs (including 96 doctors with many highly of professional and over 205 staffs are nursings as well as other staffs).

Measurement of patient's satisfaction with service provided by the concerned hospital is important from two angles [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 [5-9].

Measures healthcare quality by SERVQUAL instrument has been the predominant method used to measure 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 [6], [8]. In addition, we refer to the John E. Ware model to measure for technical quality of healthcare (Questionnaire items refer to eight dimension are: Ability, accuracy, experience, thoroughness,

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) [11], [12].

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 (GPPI), Treatment and Related Information Index (TRII), Complaints Management Index (CMI), Physical Environment Index (PEI), Discharge and Follow-up Index (DFI) [13], [14]. The VPSM provides feedback on the quality of a public hospital experience from the adult inpatient's perspective. The continuous monitoring of patient satisfaction is part of the Victorian Government's commitment to the ongoing improvement of the public health system [13], [14]. The results from the survey provide government and health service management with important information as to where quality improvement activities should be directed for greatest effect. The VPSM indices are a measure of the key components of the hospital experience for patients. Each index is calculated from the two or more survey items that best encapsulate the relevant aspect of the hospital experience.

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 measuring healthcare service quality by new tool's base on customer expectation from perceptions of services received.

2.0 Research Methodology

2.1. Selection of Study Area

Vietnam National Heart Institute, Bachmai Hospital

2.2. Selection of Respondents

Selection of study set and sampling of inpatients: Vietnam National Heart Institute in BachMai hospital were taken up for the study. To build up the sampling frame of patients, the number of inpatients whose length of stay in the hospital. Measures examination medical when they outcome hospital.

2.3. Method

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

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 [12]:

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).

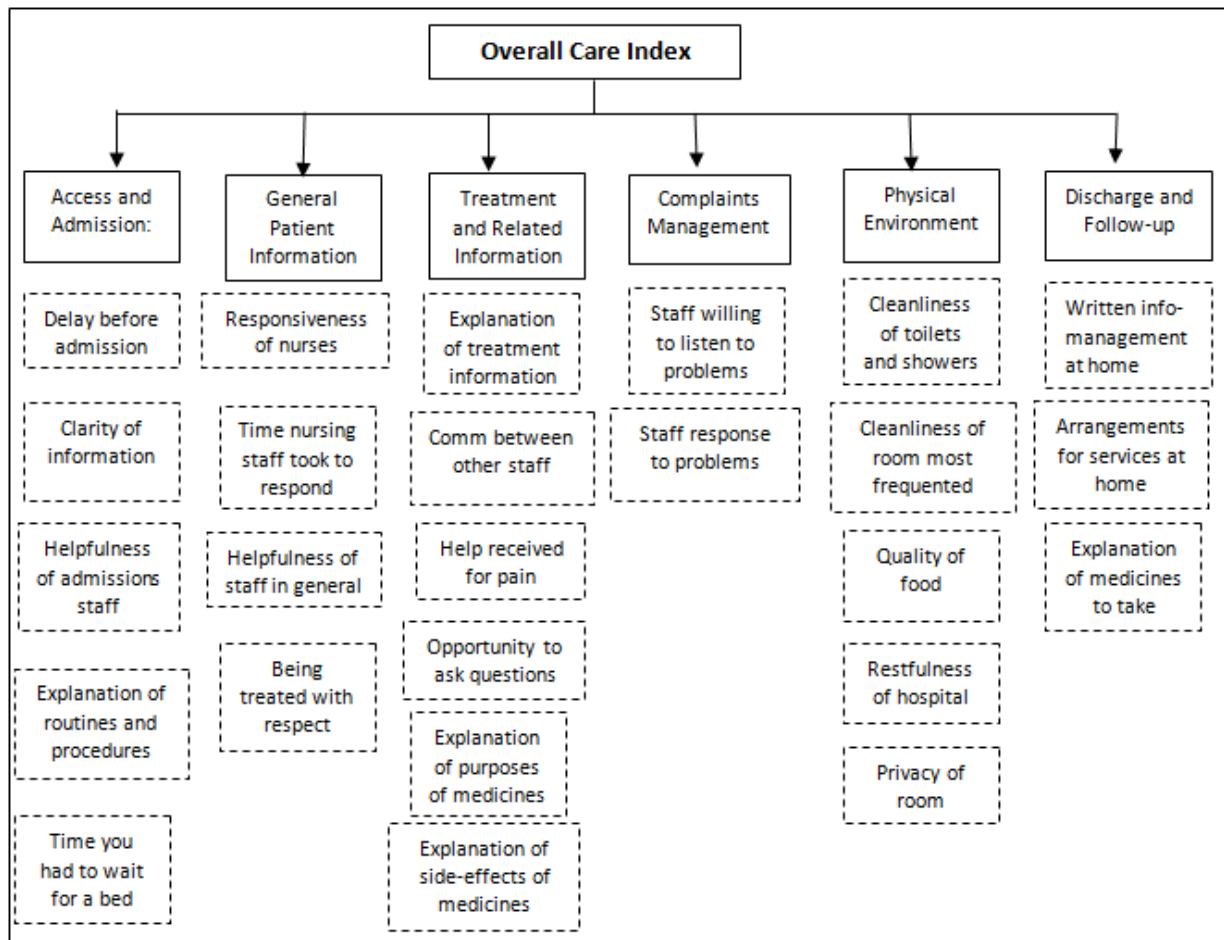
H1c: Assurance (IVC): Attitude and behavior of Doctors/staff make confidence in customers (C1). Patients feel secure in receiving medical care (C2). Hospital staff are polite to customers (C3). Doctors/staff have knowledge to answer customers' questions (C4).

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: Technical Quality (IVF): Doctor's office has everything needed to provide complete care (F1). Doctor make me confidence that their diagnosis is correct (F2). I believe 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).

Figure 1. VPSM indices and items [13], [14]

(Source: VPSM Annual Report 2012 – 12)

2.3.2 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 (IV) 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).

2.3.3 Research Hypotheses

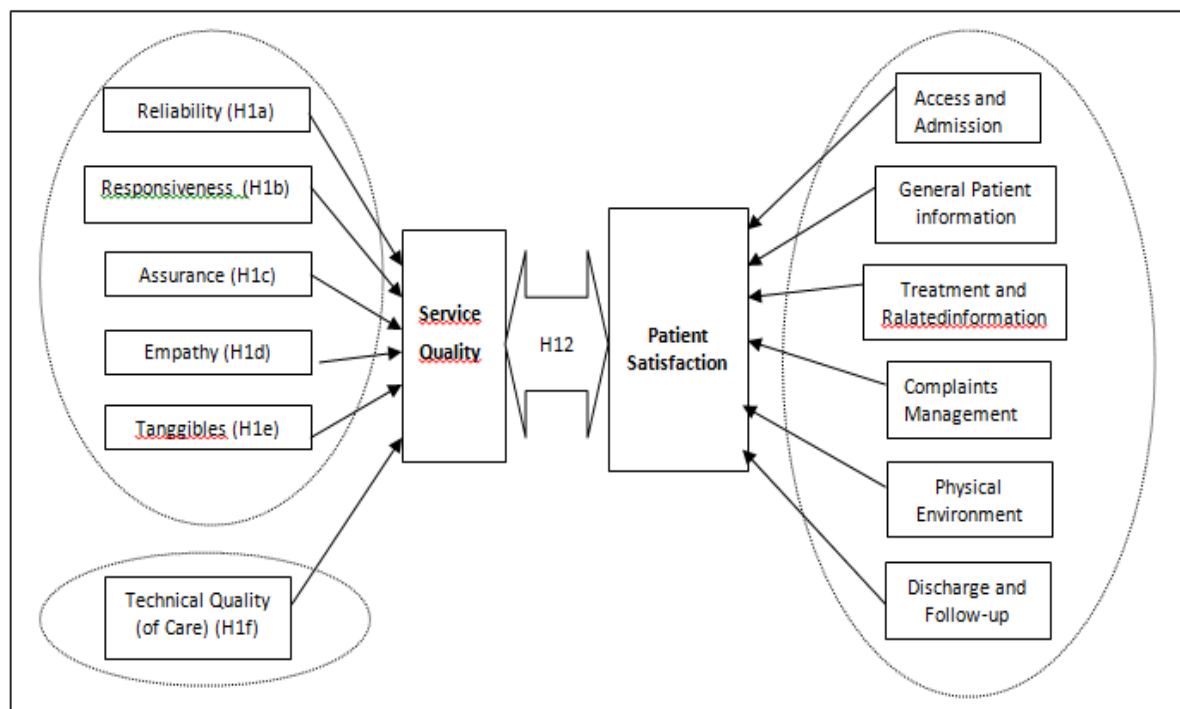
As a result, for the purpose of this research, we argue the SERVQUAL indices is reliable and that all the five dimensions of patient satisfaction in functional quality by the SERVQUAL instrument and eight dimensions of patient satisfaction in technical quality are significant in the setting of health 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 Bach Mai Hospital

❖ Research Framework:

Figure 2: Research Framework:



❖ 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.

2.3.4 Questionnaire Administration

Questionnaire were completed by inpatients at Bachmai Hospital hospital (n= 325) about a period one month.

All Data analysis has been carried out with the Statistical Package for the Social Sciences (IBM SPSS 21.0) [15-16].

3.0 Results

From the samples characteristics in Public hospital: 325 questionnaires were distributed and completed, frequency distribution of gender in the hospital are 132 male (40.6%) and 193 female (59.4%).

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 public hospital are 0.842, 0.849, 0.837, 0.794, 0.797, 0.914, respectively.

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 public hospital are 0.889, 0.857, 0.902, 0.913, 0.827, 0.827, respectively.

3.2. Exploratory Factor Analysis (EFA) for Public hospital

3.2.1. CEA for SERVICE QUALITY

There are no variables with load factor coefficient (Factor loading) is less than 0.5; So, there are no variables's remove. After performing factor analysis with 30 variables as above, we have six elements (IVA, IVB, IVC, IVD, IVE, IVF) with 30 score.

After performing factor analysis of Service quality (IVA, IVB, IVC, IVD, IVE, and IVF) with 30 variables as above (22 items of functional quality and 8 items of technical quality), we have 6 elements are drawn as follows: KMO = 0.893 is > 0.5 , 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 = $0.000 < 0.05$. Therefore suitable to conditions of factor analysis. Factors (IVA, IVB, IVC, IVD, IVE, and IVF) explained almost 73.954% with variance extracted. The rest could not be explained by the variables included in the analysis. After performing factor analysis of six construct with IVA (5 variables), IVB (4 variables), IVC (4 variables), IVD (5 variables), IVE (4 variables), and IVF (8 variables) factor; we have six elements are drawn: **Factor 1** (IVA – Reliability), **Factor 2** (IVB - Responsiveness), **Factor 3** (FQA2 – Reliability), **Factor 4** (IVD – Assurance), **Factor 5** (IVE - Tangibles), **Factor 6** (IVF – Technical Quality).

3.2.2. CEA for InPatient Satisfactions (IPS) of Public hospital

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: KMO = 0.900 (>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 74.621%.

They explained almost 74.621% only of the variance. The rest could not be explained by the variables included in the analysis. 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 (Demonstrating Rotated Component Matrix and Constructs of the Research).

3.3. Cronbach Alpha of factor and Model for Public hospital

3.3.1. Reliability for SERVICE QUALITY (SQ) of Public hospital

Table 1: Reliability statistics for Service quality of Public hospital

1a. Item-Total Statistics					
	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
IVA	20.7472	5.637	0.810	0.695	0.911
IVB	20.7775	5.339	0.821	0.713	0.911
IVC	20.6728	5.537	0.837	0.765	0.907
IVD	20.7268	5.902	0.833	0.703	0.909
IVE	20.6513	6.387	0.646	0.528	0.931
IVF	20.6155	6.004	0.815	0.711	0.912
1b. Reliability Statistics of Service quality					
Cronbach's Alpha		Cronbach's Alpha Based on Standardized Items		N of Items	
0.927		0.929		6	

Test results: Cronbach alpha coefficient for the sixth construct of Service quality (SQ) = 0.928 (> 0.7). All factors have Cronbach's Alpha if item deleted > 0.7 (IVA = 0.911, IVB = 0.911, IVC = 0.907, IVD = 0.909, IVE = 0.931, IVF = 0.912). The Coefficients Corrected Item-Total Correlation of six construct of SQ are IVA = 0.810; IVB = 0.821; IVC = 0.837; IVD = 0.833; IVE = 0.646 and IVF = 0.815.

3.3.2. Reliability for PATIENT SATISFACTION (PS) of Public hospital

Table 2: Reliability statistics for Patient satisfaction of Public hospital

2a. Item-Total Statistics					
	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
DVa	20.2006	7.278	0.822	0.712	0.910
DVb	20.1034	7.169	0.814	0.691	0.911
DVc	20.0613	7.354	0.881	0.787	0.904
DVd	20.0757	6.689	0.772	0.673	0.922
DVe	20.2905	7.596	0.760	0.593	0.918
DVf	20.0624	7.769	0.739	0.590	0.921
2b. Reliability Statistics of Patient satisfaction (PS)					
Cronbach's Alpha		Cronbach's Alpha Based on Standardized Items		N of Items	
0.928		0.932		6	

Test results: Cronbach alpha coefficient for the sixth construct of patient satisfaction (PS) = 0.928 (> 0.7). All factors have Cronbach's Alpha if item deleted > 0.7 (DVa = 0.910, DVb = 0.911, DVc = 0.904, DVd = 0.922, DVe = 0.918, DVf = 0.921). The Coefficients Corrected Item-Total Correlation of six construct of IPS are DVa = 0.822; DVb = 0.814; DVc = 0.881; DVd = 0.772; DVe = 0.760 and DVf = 0.739.

3.4. Correlation Between Service Quality (Sq) And Inpatient Satisfaction (Ps)

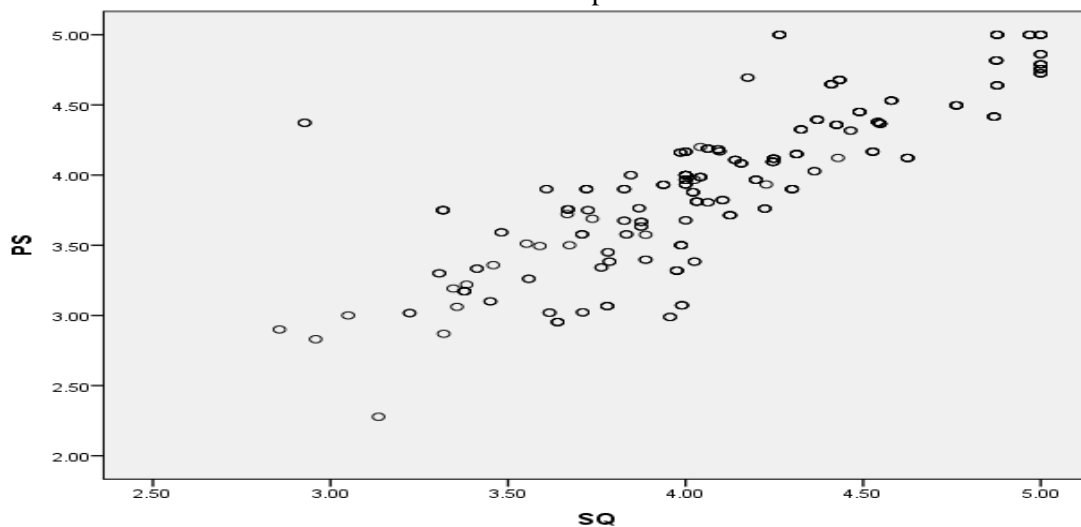
Table 3: Correlation between Service Quality (SQ) and InPatient Satisfaction (IPS) of the Results in the BachMai hospital:

Correlations				PS	SQ	
PS	Pearson Correlation			1	0.834**	
	Sig. (2-tailed)				0.000	
	N			325	325	
	Bootstrap ^b	Bias			0	0.000
		Std. Error			0	0.026
		95% Confidence Interval	Lower		1	0.780
Upper				1	0.879	
SQ	Pearson Correlation			0.834**	1	
	Sig. (2-tailed)			0.000		
	N			325	325	
	Bootstrap ^b	Bias			0.000	0
		Std. Error			0.026	0
		95% Confidence Interval	Lower		0.780	1
Upper				0.879	1	

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

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

Figure 3: Correlation between Service Quality (SQ) and Patient Satisfaction (PS) of the Results in the BachMai hospital:



Note: R = 0.834, Sig. = 0.000 (n= 325)

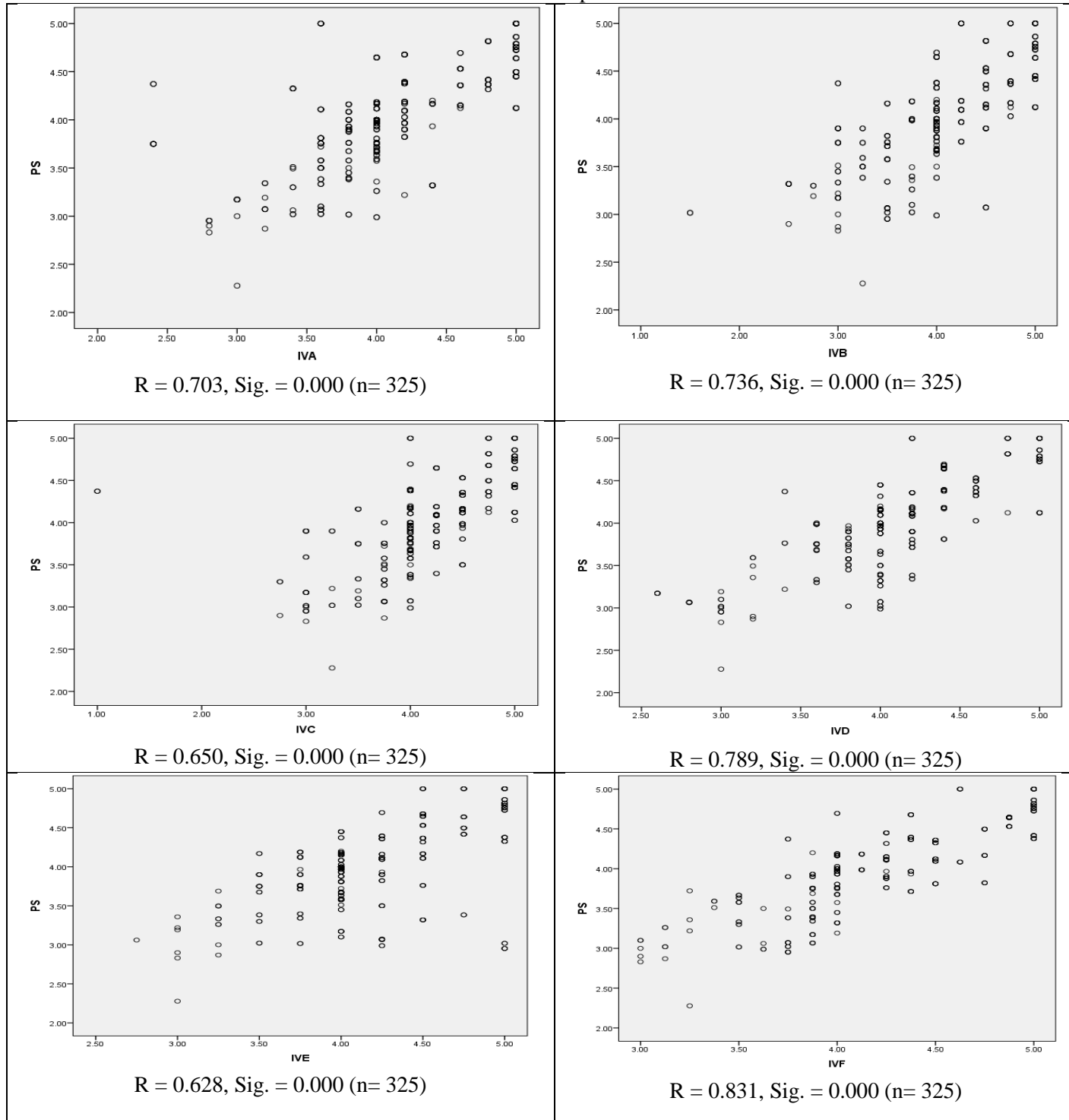
Table 4: Correlation between Patient Satisfaction (PS) and factors of Service quality (SQ):

		Correlations							
		PS	IVA	IVB	IVC	IVD	IVE	IVF	
PS	Pearson Correlation	1	0.703**	0.736**	0.650**	0.789**	0.628**	0.831**	
	Sig. (2-tailed)		0.000	0.000	0.000	0.000	0.000	0.000	
	N	325	325	325	325	325	325	325	
	Bootstrap ^b	Bias	0	0.001	0.001	0.006	0.000	0.000	0.000
		Std. Error	0	0.037	0.024	0.060	0.021	0.050	0.015
		95% Confidence Interval	Lower	1	0.627	0.686	0.537	0.746	0.523
Upper			1	0.773	0.782	0.764	0.829	0.722	0.860
IVA	Pearson Correlation	0.703**	1	0.742**	0.803**	0.716**	0.519**	0.686**	
	Sig. (2-tailed)	0.000		0.000	0.000	0.000	0.000	0.000	
	N	325	325	325	325	325	325	325	
	Bootstrap ^b	Bias	0.001	0	-0.001	0.001	0.000	0.001	0.000
		Std. Error	0.037	0	0.033	0.020	0.029	0.054	0.028
		95% Confidence Interval	Lower	0.627	1	0.674	0.764	0.655	0.413
Upper			0.773	1	0.806	0.841	0.770	0.623	0.738
IVB	Pearson Correlation	0.736**	0.742**	1	0.814**	0.730**	0.541**	0.680**	
	Sig. (2-tailed)	0.000	0.000		0.000	0.000	0.000	0.000	
	N	325	325	325	325	325	325	325	
	Bootstrap ^b	Bias	0.001	-0.001	0	0.002	0.000	-0.001	0.000
		Std. Error	0.024	0.033	0	0.024	0.023	0.045	0.026
		95% Confidence Interval	Lower	0.686	0.674	1	0.770	0.680	0.451
Upper			0.782	0.806	1	0.861	0.772	0.627	0.730
IVC	Pearson Correlation	0.650**	0.803**	0.814**	1	0.743**	0.508**	0.685**	
	Sig. (2-tailed)	0.000	0.000	0.000		0.000	0.000	0.000	
	N	325	325	325	325	325	325	325	
	Bootstrap ^b	Bias	0.006	0.001	0.002	0	0.002	0.002	0.002
		Std. Error	0.060	0.020	0.024	0	0.029	0.052	0.033
		95% Confidence Interval	Lower	0.537	0.764	0.770	1	0.693	0.413
Upper			0.764	0.841	0.861	1	0.801	0.616	0.749
IVD	Pearson Correlation	0.789**	0.716**	0.730**	0.743**	1	0.621**	0.767**	
	Sig. (2-tailed)	0.000	0.000	0.000	0.000		0.000	0.000	
	N	325	325	325	325	325	325	325	
	Bootstrap ^b	Bias	0.000	0.000	0.000	0.002	0	0.001	0.000
		Std. Error	0.021	0.029	0.023	0.029	0	0.051	0.023
		95% Confidence Interval	Lower	0.746	0.655	0.680	0.693	1	0.520
Upper			0.829	0.770	0.772	0.801	1	0.715	0.810
IVE	Pearson Correlation	0.628**	0.519**	0.541**	0.508**	0.621**	1	0.715**	
	Sig. (2-tailed)	0.000	0.000	0.000	0.000	0.000		0.000	
	N	325	325	325	325	325	325	325	
	Bootstrap ^b	Bias	0.000	0.001	-0.001	0.002	0.001	0	-0.001
		Std. Error	0.050	0.054	0.045	0.052	0.051	0	0.042
		95% Confidence Interval	Lower	0.523	0.413	0.451	0.413	0.520	1
Upper			0.722	0.623	0.627	0.616	0.715	1	0.789
IVF	Pearson Correlation	0.831**	0.686**	0.680**	0.685**	0.767**	0.715**	1	
	Sig. (2-tailed)	0.000	0.000	0.000	0.000	0.000	0.000		
	N	325	325	325	325	325	325	325	
	Bootstrap ^b	Bias	0.000	0.000	0.000	0.002	0.000	-0.001	0
		Std. Error	0.015	0.028	0.026	0.033	0.023	0.042	0
		95% Confidence Interval	Lower	0.801	0.629	0.627	0.622	0.722	0.626
Upper			0.860	0.738	0.730	0.749	0.810	0.789	1

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

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

Figure 4: Correlation between Patient Satisfaction (PS) and factors of Service quality (SQ) of the Results in the BachMai hospital



Note: The Scatterplot (BIVAR) of patient satisfaction (PS) with factors of service quality (IVA, IVB, IVC, IVD, IVE, IVF).

4.0 DISCUSSION

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:

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. Overall Cronbach Alpha of public data along with service quality construct provides values greater than 0.60, as the values of Cronbach Alpha greater than 0.60 is acceptable [15-16].

4.2. Exploratory Factor Analysis (EFA) for Public hospital (Bachmai hospital)

4.2.1. CEA for SERVICE QUALITY

There are on anyone variables with load factor coefficient (Factor loading) is less than 0.5; therefore, there are not variables's remove. After performing factor analysis, we have six elements (30 score) are drawn: Factor 1 (IVA – Reliability), Factor 2 (IVB - Responsiveness), Factor 3 (IVC – Assurance), Factor 4 (IVD - Tangibles), Factor 5 (IVE – Tangibles), and Factor 6 (IVF - Technical Quality).

4.2.2. CEA for Patient satisfaction (PS) of Public hospital

Factor analysis discovered EFA with inpatient satisfaction variable group of 6 factor as DVa, DVb, DVc, DVd, DVe, DVf). As can be seen as above, the rotation converged in 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.

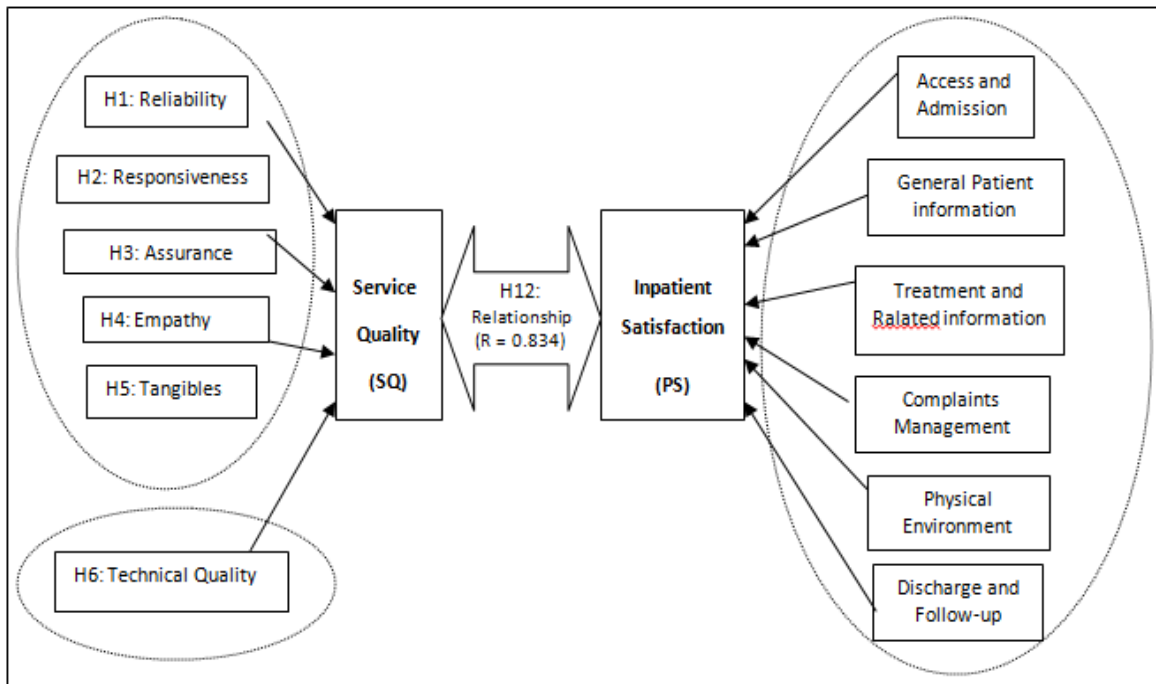
4.3. Cronbach Alpha of factor and Model for Public hospital

The reliability coefficient, Quality service is bring to checks in the Cronbach alpha coefficient for the sixth construct of Service Quality (SQ) is 0.927 (> 0.7) and all the variable in service quality have coefficients of Corrected item - Total Correlation are greater than 0.3. (Table 1).

The reliability coefficient, Service quality is bring to checks in the Cronbach alpha coefficient for the sixth construct of Patient satisfaction (PS) is 0.928 (> 0.7) and all the variable in service quality have coefficients of Corrected item - Total Correlation are greater than 0.3 (Table 2). Satisfactory inspection, ensure conditions for inclusion in the model analysis.

After Multiple Linear Regression analysis (Pearsom coefficient), the initial research model through factor analysis results are adjusted as Figure 5.

Figure 5: Adjusted research model in Public hospitals.



The initial research model through factor analysis results are adjusted as Figure 5 & Table 5 as follow:

Table 5: Summary of Hypotheses Findings in Public hospital

Hypothesis	Result
(H1): There is a relationship between Reliability factor (IVA) and Service quality (SQ)	Supported
(H2): There is a relationship between Responsiveness factor (IVB) and Service quality (SQ).	Supported
(H3): There is a relationship between Assurance factor (IVC) and Service quality (SQ).	Supported
(H4): There is a relationship between Empathy factor (IVD) and Service quality (SQ).	Supported
(H5): There is a relationship between Tangibles factor (IVE) and Service quality (SQ).	Supported
(H6): There is a relationship Technical Quality factor (IVF) and Service quality (SQ).	Supported
(H12): There is a relationship between Service Quality and InPatient Satisfaction.	Supported

Thus, the initial research model ‘s ensure method of mesuring healthcare service quality by new tool’s base on customer expectation.

4.4. Correlation Between Service Quality (Sq) And Inpatient Satisfaction (Ps)

Multivariate regression analysis was performed to examine the relationship between the dependent variable's Service quality (SQ) with independent variable's InPatient Satisfaction (IPS) have correlation with each other (correlation coefficient each other = 0.834) (Table 3, Figure 3). Dependent variables of inpatient satisfaction (PS) for each independent variable have correlation with each other, through specific expressions of correlation coefficient as follows: IVA (0.703), IVB (0.736), IVC (0.650), IVD (0.789), IVE (0.628), IVF (0.831) is calibrated (2-tailed) was statistically significant at 1%. Preliminarily we can conclude the

independent variables included in the model can to explain the dependent variable inpatient satisfaction (IPS) (Table 4, Figure 4) [15], [16].

Thus, Service quality directly and positively influences patient satisfaction (Figure 5), and (H12) hypothesis is supported (Table 5).

5.0 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 public hospitals is strongly affected by different factors.

The fifth method's Measuring healthcare quality by functional and technical quality; The functional quality by SERVQUAL instrument 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 six main factors are Reliability (IVA) with 5 variables, Responsiveness (IVB) with 4 variables, Assurance (IVC) with 4 variables, Empathy (IVD) with 5 variables, Tangible (IVE) with 4 variables, and Technical quality (IVF) had 8 variables. The second method's measuring healthcare by Tool of VPSM with 6 origin dimensions. 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 ($R=0.834$) between patient satisfaction (PS) and service quality (SQ) with high significant ($p < 0.0001$), ensure method of measuring healthcare service quality by new tool's base on customer expectation.

REFERENCE

1. Andaleeb SS. Service Quality Perceptions and Patient Satisfaction: A study of Hospitals in a Developing Country. *Social Science & Medicine*. 2001; 52 (9): 1359-1370.
2. Deardorff AV. Developing Country Growth and Developed Country Response. Discussion Paper. 2000; 462.
3. Gronroos C. Dimensions of Service Quality, Service Management and Marketing. Lexington Books, Lexington, MA.; 1990.
4. Zaibaf M., et al. Effect of Perceived Service Quality on Customer Satisfaction in Hospitality Industry: Gronroos' Service Quality Model Development. *Journal of Hospitality Marketing & Management*. 2013; 22 (5): 490- 504.

5. Parasuraman A, Zeithml VA, Berry LL. SERVQUAL: A Multiple-Item Scale for Measuring Consumer Perceptions of Service Quality. *Journal of Retailing*. 1998; 64 (1): 12-40.
6. Shahin A. SERVQUAL and Model of Service Quality Gaps: A Framework for Determining and Prioritizing Critical Factors in Delivering Quality Services, University of Isfahan, Iran; 2008.
7. Emin B, et Mangold WG. Adapting the SERVQUAL Scale to Hospital Services: an Empirical Investigation. *Health Service Research*. 2010; 26 (6): 767-780.
8. Kane RL, Maciejewski M, Finch M. The relationship of Patient Satisfaction with Care and Clinical Outcomes. *Medical Care*. 1997; 35 (7): 714-730.
9. Venetis KA, Ghauri PN. Service quality and customer retention: Building long-term relationships. *European Journal of Marketing*. 2004; 38 (11/12): 1577-1598.
10. Iwaarden VJ, et al. Applying SERVQUAL to Web sites: an exploratory study. *International Journal of Quality & Reliability Management*. 2003; 20 (8): 919-935.
11. Brysland A., and Curry A. Service improvements in public service using SERVQUAL”, *Management Service Quality*. 2001; 11 (6): 389-401.
12. Ware JE., Davies-Avery Jr. A. , et Stewart AL. The Measurement and Meaning of Patient Satisfaction: A review of the literature. The Rand Corporation – Santa Monica, California. 2002; 2002: 6036 - 1997.
13. NSQHS Standards. National Safety and Quality Health Service Standards: Australian Commission on Safety and Quality in Healthcare. Endorsed by Australian Health Ministers September 2011, ACSQH, Sydney; 2011.
14. Victorian Government health Information. VPSM Survey Process -Victorian Patient Satisfaction Monitor, Australia. 2013; Available: <http://www.health.vic.gov.au/consumer>.
15. Khelifa M. Factor Analysis. Zayed University Office of Research SPSS for Windows® 2009; 2009.
16. Khelifa M. Multiple Linear Regression Analysis. Zayed University Office of Research SPSS for Windows®2009; 2009.