S M A R T J o u r n a l o f B u s i n e s s M a n a g e m e n t S t u d i e s
(A Professional, Refereed, International and Indexed Journal)
www.smartjournalbms.org

DOI : 10.5958/2321-2012.2020.00015.9

MEASURING MODERATING ROLE OF MANAGEMENT INFORMATION SYSTEM ON SERVQUAL DIMENSIONS FOR THE ATTAINMENT OF QUALITY HEALTH CARE SERVICES OF PUBLIC HOSPITALS IN KINGDOM OF SAUDI ARABIA

Asma Zaheer*

Faculty of Economics and Administration

King Abdulaziz University

Jeddah. Kingdom of Saudi Arabia

ameraj@kau.edu.sa

Abstract

The study proposes to determine the role of MIS, on SERVQUAL dimensions in hospitals and assess the quality of services offered compared to their expectations. SERVQUAL, (a customized service quality measurement scale) was employed to work on the dimensions, by which service quality was mostly evaluated in hospitals. Questionnaires were developed and 309 respondents constituted the sample for the study. The SPSS statistical tool was used, to examine, analyse and interpret data. The overall study concluded that the quality of MIS, in public hospitals of KSA, was not highly satisfactory.

Keywords: *MIS, Information System, Service Quality, Public Hospitals and SERVQUAL.*

JEL Code : *M39, M00, M15 and L19*

Paper Received : *27-12-2019* ***Revised :*** *02-02-2020* ***Accepted :*** *05-03-2020*

*** Corresponding Author**

1. Introduction

Like other system based Information and Communication Technology, the introduction of Management Information System also influences the performance and outcome of hospitals. According to **Winter (2003),** a healing center data framework is characterized as a subsystem of a doctor's facility, which contains all data handling activities and also the related human or specialized performers in their particular data transforming part. MIS plays a crucial role in any organization in the form of furnishing information and offerly support services, which are often needed to plan and monitor performance and efficiency of an organization. According to the review of related literature, hospital information management/ information/clinical system is normally utilized in most hospitals around the globe, to facilitate the overall management of the health care services, after the collection of factual data, elicited through MIS, regarding diseases or patients or staff members. According to **Aghazadeh, et al. (2013),** many hospitals employ information management systems like hospital information systems (HIS) for collecting the patient information. Health information frameworks, can be formed by writing frameworks that are primarily used to gather, break down, hold, recover and assess data, related to health and thus healthcare. The ultimate objective of HMIS-Health Management Information System is to check the quality of the organization (hospital) by different means. The HIS-Health Information System covers all the information, used in a health facility. The performance of an information system depends on multiple factors. One of these is the human factor. The HIS should be designed to facilitate the integration of real-time information between the operational and decision-making. HMS elicits information related to financing and accounting of the stock. As mentioned, this paper focuses on the development of a Management Information System (MIS), to plan and monitor the healthcare delivery services in government hospitals of kingdom of Saudi Arabia (KSA). The ministry of health in KSA started with a directorate from the early 2000s, **Walston, et al., (2008).** Health services in the Kingdom have been externally accredited, including by the Canadian Council on Health Services Accreditation. The country has both public and private providers. It is interesting to note that only around 20 % of physicians and nurses are Saudi citizens and others represent different parts of the world.

1.1. Dimensions of Service Quality

According to '**Vargo** and **Lusch (2008), s**ervice is the implementation of special ability through actions, procedures, and execution for the benefit of organization and itself. **IFM** and **IBM (2008)** defined 'service system' as a useful co-creating process, by using resources which include people, technology, organization and transform information, to satisfy customer needs, in comparison to others. Service Quality is a notion which relates Perceived Expectations (E) of service with Perceived Performance (P), which gives an equation, **SQ = P-E Parasuraman, et al. (1988).** SERVQUAL is an instrument "for surveying client impression of service quality in service and retailing associations". Following five dimensions have been perceived as indicators of service quality: Tangibility, Reliability, Responsiveness, Assurance and Empathy. Based on these gaps, following objectives were considered for this research and questionnaire was designed accordingly for the collection of data.

- **System quality** – usability, system adaptability, system unwavering quality, and simplicity of adapting, and system gimmicks

of instinct, complexity, adaptability, and reaction times

- **Information Quality** –attractive qualities of the system yields; that is, administration reports and Web pages. For instance: importance, understandability, exactness, compactness, fulfillment, understandability and ease of use.
- **System Use** – the degree and way in which staff and clients use the capacities of a data system. For instance: measure of utilization, recurrence of utilization, nature of utilization, fittingness of utilization, degree of utilization, and motivation behind utilization.
- **User Satisfaction** – clients' level of fulfillment with reports
- **Net Benefits** – helping the accomplishment of doctor's facility, for instance: enhanced choice making, enhanced benefit, expanded staff, cost diminishment, enhanced benefits, market productivity, welfare, formation of occupations, and financial advancement.

2. Review of Literature

According to **Burton, et al (2004), s**ome studies found that if HIT is adopted in hospitals, it can improve information system and facilitate integration of services within the hospital system. **Epping (2004)** reported about health care quality and safety reduction on costs. According to **Nagle** and **Catford, (2008); Elsami, et al., (2008)** and **Hayrinen, et al.,(2008),** MIS would enhance and develop quality of health care system through e-prescribing systems and comprehensive documentation of care. According to **Messner (2005)** and **Young, et al., (2000), s**taff satisfaction and fulfillment of medicinal services conveyance, have been broadly acknowledged as an essential indicator of quality service. According to **Edura Wan Rashid** and **Kamaruzaman Jusoff (2009),** patient depends on the physical facilities rather than technical facilities, which are also an important part of service quality. **Aghazadeh, et al. (2012)** reported that retrieving patient information and further care is better by accessing previous information from MIS system. According to **Mehraeen** and **Ahmadi (2014),** HIS provides satisfactory health care service quality, to fulfill the need of patients.

Dorgan et al., (2010), Geelhoed and **de Klerk, (2012)** also focus on the role of the efficient use of management incorporate mission and vision (line up with operational and financial perspectives). According to **Rike Antje Kraska et. al (2016),** search is important for satisfaction of patient **DeLone** and **McLean, (1992)** found that the most important dimension of IS success is system quality. According to **Whittaker** and **Voas, 2006;** today's software is more developed than what it was fifty years ago to resolve problems. **Pitt et al. (1995)** point out that information system not only a system it should also provide services. Many studies by **Bailey** and **Pearson, 1983; Doll et al., 1994** have developed tools to compute user satisfaction. According to Gable et al., (2003), many things in the satisfaction of customers, indicate the need for a readily available map, to calculate system and information standard. **Teo** and **Wong (1998)** reported that the dimension of satisfaction is not well defined. According to **(Melville et al., 2004; Rai et al., 2006),** IT assets make economic importance by operational quality and creating competitive information system for different users in the company, and organization success depends on how efficiently the information system services are delivered. **(Kettinger** and **Lee, 2005)** find SERVQUAL use to correlate the services, which are delivered by IS departments.

3. Statement of the Problem

Health care quality has become the most important issue, for any hospital service in KSA. Many studies have been done on MIS health care service quality, in many countries but not in KSA. To find the gap between the perceived and expected health care service quality, this empirical study examined the satisfaction gap between perceived and expected health care service quality, specially in public hospitals of KSA.

4. Need of the Study

Very few studies have been conducted, regarding the MIS system service quality, towards hospital patient satisfaction. This research analyses the gap in MIS health care service quality towards patient satisfaction of public hospitals in KSA

5. Objective of the Study

The research objective was to examine the role of MIS on service quality in hospitals and establish the empirical significance between the perceived qualities of service, offered by MIS in Hospital and their patient expectations.

6. Hypothesis of the Study

NH-1: Significant difference does not exist for the quality of service provided by MIS in public hospital in KSA.

7. Research Methodology

7.1 Sample Selection

Data were gathered, using a questionnaire (see **Table No-1** for description of questions for the Questionnaire), distributed to 650 respondents, in 20 different public hospitals in KSA. 309 filled in questionnaires were received, with nearly 61% of rate of response, which was sufficient for the analysis. The response rate for men was 84% compared to female, which was only 15%.

7.2 Period of the Study

Data were collected for the period of 2018-2019

7.3 Sources of Data

Primary data were collected by using a well framed questionnaire.

7.4 Tools used in the Study

The empirical study measured the Role of Management Information System on Service Quality in Public Hospitals in KSA. To serve this purpose, SERVQUAL (customized service quality measurement scale) was used to work on the dimensions by which evaluation of the service quality was done in hospitals. Data were entered in SPSS and accordingly, analysed by busing t-Tests and ANOVA.

8. Data Analysis

8.1 Perception of Gender Groups

The **Table-2** shows the perception of Gender Group towards Service Quality. The mean value of 127 male respondents, was 3.56 and 182 female respondents' mean value was 3.54. In other words, they neither agreed nor disagreed with the service quality of MIS in the hospital. To test the significance difference between male and female respondent staff, the independent t-test, was applied. The value of p=.188 revealed no significant differences between gender respondents **(See Table No. 3).** Hypothesis Ho was supported.

8.2 Perception of Different Age Groups

According to the **Table-4,** the overall mean of 12 respondents, below 20 age was 3.75, the total mean value of 94 respondents of age 20 to 30 was 3.55 and the mean value of 114 respondents of the age group 31 to 40 was 3.55, for 72 respondents in the age group 41 to 50, the mean value was 3.52, 11 respondents of age group between 51 and 60 recorded a mean value

of 3.47 and the last six respondents, above age 60, reported a mean value of 3.55. In other words, all respondents, of different age groups were not highly satisfied, with the role of MIS service quality in public hospitals. To test the significance difference between all age group respondents and within all age group respondents, ANOVA was applied. The value of p=0.817, indicated no significant difference of opinion between age group of respondents, towards the role of MIS service quality, in public hospitals **(Table-5).** Hence Hypothesis Ho, was supported.

8.3 Perception of Different Education Groups

According to the **Table-6,** the mean value of 54 respondents, with high school, was 3.40, 149 graduate respondents recorded a mean value of 3.58, 93 post graduate respondents, reported a mean value of 3.60 and 13 other respondents a mean value of 3.46, towards the role of MIS service quality in public hospitals. In short, all respondents, having different educational qualifications, were not highly satisfied with the service quality of MIS. To test the significant difference between different education group respondents and within education group respondents, ANOVA was applied. The value of p=0.135, revealed no significant difference of opinion, between different education group of respondents, towards the service quality of MIS **(Table-7).** Hypothesis Ho was supported.

9. Findings of the Study

The perception of all 309 respondents indicated unsatisfactory service quality of MIS in public hospitals, in KSA. Therefore, it was concluded that there was a gap between perception and expectation of the services, provided by MIS, in public hospitals in KSA.

9.1 Perception with Reference to Gender Groups

The total perception of gender group respondents towards the role of MIS to provide services, in public hospitals in KSA, was not satisfactory.

9.2 Perception with Reference to Age Groups

The overall perception of 309 different age group respondents, revealed that they were not highly satisfied about MIS service quality. The quality was effective in the beginning but later declined.

9.3 Perception with Reference to Education Groups

Perception of 309 of the education group respondents, towards MIS services like easy appointment procedure, being quick to respond to patient need, patient being briefed about treatment, medication being clear, staff knowledge to answer patient questions, were also not highly satisfactory.

10. Suggestions

The total perception 309 respondents, with reference to gender, age and education group, towards the role of MIS to provide services, were not highly satisfactory and hence the need for the service quality, provided in public hospital of KSA, to be improved, for the attainment of health care service quality

11. Conclusion

According to gender group respondents, the MIS service quality was not satisfactory and even the respondents, from different age groups, also reported the same opinion. Data also indicated that people with different education backgrounds, were also not very satisfied, towards the MIS health care service quality.

Overall, this empirical research found that the role of MIS, for attaining quality health care services in public hospitals of KSA, was not highly satisfactory.

12. Limitations of the Study

The research survey was limited to public hospitals. Private hospitals survey could also be included, which can give a different picture of analysis. Bigger sample size could have been taken.

13. Scope for Further Research

Further research could be carried out in private hospitals, with a bigger sample size of the respondents.

14. References

Aghazadeh,S., Aliyev, A., Ebrahimnezhad, M. (2013). Study the effect of Hospital Information Systems (HIS) on Communication Improvement and Service Quality among Nursing Staff, *Life Science Journal*, *10*(s), 307-310 .

Aghazadeh,S., Aliyev, A., Ebrahimnezhad, M.. (2012). Review the Role of Hospital Information Systems in Medical Services Development. International Journal of Computer Theory and Engineering *4*(6), 866-897.

Al-Borie HM, Sheikh Damanhouri AM (2013) Patients' satisfaction of service quality in Saudi hospitals: a SERVQUAL analysis. International journal of health care quality assurance 26:20–30

Bailey, J.E., Pearson, S.W. (1983). Development of a tool for measuring and analyzing computer user satisfaction. Management Science 29, 530–545

Burton L, Anderson G, Kues I (2004). Using electronic health records to help coordinate care. Milbank Quarterly, 82 (3), pp. 457–481. care setting. International journal of health care quality assurance *22*(5), 471-482.

Dagger TS, Sweeney JC, Johnson LW (2007) A hierarchical model of health service quality: scale development and investigation of an integrated model. J Serv Res 10:123–142

Davis, B. (1999) "Measuring and Managing Service Quality" Marketing Intelligence & Planning, 17(1): 33-40.

DeLone, W. H., & McLean, E. R. (1992). Information Systems Success: The Quest for the Dependent Variable. Informatioti Systems Research, 3 (1), 60-95.

Doll, M.J., Xia, W., Torkzadeh, G.(1994). A confirmatory factor analysis of the end-user computing satisfaction instrument. MIS Quarterly 18, 453–461

Dorgan, S., Layton, D., Bloom, N., Homkes, R., Sadun, R. and Van Reenen, J., (2010), "Management in Healthcare: Why good practice really matters?" http://world management survey.org/wpcontent/images/ 2010/10/Management_in_ Healthcare_ Report_20 10.pdf retrieved on 18.12.2019.

Edura Wan Rashid, W. and H. Kamaruzaman Jusoff (2009). Service quality in health

Elsami S, Keizer de NF, Abu-Hanna A (2008). The role of computerized physician order entry in hospitalized patients—a systematic review. International Journal of Medical Informatics, 77 (6), pp. 365–376.

Epping Jordan JE, Pruitt SD, Bengoa R, Wagner EH (2004). Improving the quality of health care for chronic conditions. Quality and Safety Health Care. 13 (4), pp. 299–305.

Gable, G.G., Sedera, D., Chan, T. (2003). Enterprise systems success: a measurement model. In: Proceedings Twenty-Fourth International Conference on Information Systems, pp. 576–591.

Hayrinen K, Saranto K, Nykanen P (2008). Definition, structure, content, use and roles of electronic health records: a review of the research literature. International Journal of Medical Informatics, 77 (5), pp. 291–304.

IfM and IBM .(2008). Succeeding through service innovation: A service perspective for education, research, business, and government. Cambridge, UK: University of Cambridge Institute for Manufacturing

Kettinger, W.J., Lee, C.C.,(2005). Zones of tolerance. Alternative scales for measuring information systems service quality. MIS Quarterly 29 (December), 607– 623.

McAlexander JH, Kaldenberg DO, Koenig HF (1994) Service quality measurement. Journal of health care marketing 14:34–40

McDougall G, Levesque T (1995) A revised view of service quality dimensions: an empirical investigation. J Prof Serv Mark 11:189–210

McKinsey Global Institute Report (2015). Saudi Arabia beyond oil: the investment and productivity transformation: McKinsey global institute;

Melville, N., Kraemer, K., Gurbaxani, V.,(2004). Review: information technology and organizational performance. an integrated model of business value. MIS Quarterly, 283–322.

Messner ER (2005).. Quality of care and patient satisfaction the improvement efforts of one emergency department. Top Emergency Medicine, 27 (2), pp. 132–141.

Mosadeghrad MA (2013) Healthcare service quality: towards a broad definition. International journal of health care quality assurance 26:203–219

Nagle LM, Catford P **(2008).** Toward a model of successful electronic health record adoption. Health Care Quarterly, 11 (3), pp. 84–91.

Parasuraman, A., Zeithaml, V.A. and Berry, L.L. (1988), "SERVQUAL: a multi-item scale for measuring consumer perceptions of the service quality", Journal of Retailing, Vol. 64, No. 1, pp. 12- 40.

Petter, S., DeLone, W., & McLean, E. (2008). Measuring information systems success: models, dimensions, measures, and interrelationships. European Journal of Information Systems, 17 (3), 236-263.

Pitt, L.F., Watson, R.T., Kavan, C.B., (1995). Service quality: a measure of information system effectiveness. MIS Quarterly 19, 173–187.

Rike Antje Kraska, Marcel Weigand, Max Geraedts (2016), Associations between hospital characterstics and patient satisfaction in Germany.

Salmela, H., 1997. From information system quality to sustainable business quality. Information and Software Technology 39, 819–825.

Teo, T.S., Wong, P.K., (1998). An empirical study of the performance impact of computerization in the retail industry. Omega: International Journal of Management Science 26, 611–621.

Vargo, S. L., & Lusch, R. F. 2008. "Service–dominant logic: continuing the evolution". Journal of the Academy of Marketing Science, (36:1), pp.1–10.

Walston S, Al-Harbi Y, Al-Omar B (2008). The changing face of healthcare in Saudi Arabia. Annals of Saudi Medicine, 28 (4), pp. 243-250.

Whittaker, J.A., Voas, J.M. (2006). Years of software: key principles for quality. Software Quality Management Magazine 3 (January), 5–8.

Winter AF. (2003). Strategic information management plans: the basis for systematic information management in hospitals. International Journal of Medical Informatics. pp. 99–109.

World Health Organization (2018) Non-communicable diseases (NCD) country profiles. Geneva: WHO Press; 2018. Available from: http://www.who.int/nmh/countries/sau_en.pdf.

Young GJ, Meterko M, Desai KR (2000). Patient satisfaction with hospital care: effects of demographic and institutional characteristics. Medical Care, 38 (3), pp. 325–334.

Table-1: Description of Questions for Questionnaire

Serial No	Questions
1.	Information System is easy and simple.
2.	Information System is reliable.
3.	Information System reports are satisfied.
4.	Information System makes easy to give appointments.
5.	Information System makes easy to retrieve staff information.
6.	Information System makes easy procedure to give service to staff
7.	Information System stores all information about staff data, billing, treatment, tests and prescriptions.
8.	Information System retrieves information about stock, equipments, Human Resource and accounts.
9.	Information System enables hospitals and doctors to better serve their staff.
10.	Information System Improved Service quality of staff care.
11.	Information System responds quickly to staff's need.
12.	Information System gives plenty of individual attention to staff.
13.	Information System assistant readily available all the time.
14.	Information System increased hospital productivity.
15.	Information System reduces time for filling out forms.
16.	Information System control cost.
17.	Information System brings all departments of the hospital into single entity.
18.	Information System reports helps in decision making.
19.	Information System maintains records necessary for statutory requirements.
20.	Information System helps to consult specialists without geographic constraints.
21.	Information System helps to Print, E-mail or fax report.
22.	Information System contributes to the overall service quality of hospital.

Source : Framed by Authors

Table-2: Results of Descriptive Statistics for Gender Group

	Respondents' Gender	N	Mean	Std. Deviation	Std. Error Mean
Mean	Male	127	3.56	0.570	0.050
	Female	182	3.54	0.515	0.038

Source : Primary data computed using SPSS

Table-3: Results of Gender Group Independent T-Test Results

	Levene's Test for Equality of Variances		t-test for Equality of Means						
								95% Confidence Interval of the Difference	
	F	Sig.	T	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Equal variances assumed	1.743	0.188	0.261	307	0.794	0.016	0.062	-0.106	0.138
Equal variances not assumed			0.256	253	0.798	0.016	0.063	-0.108	0.141

Source : Primary data computed using SPSS

Table-4: Results of Descriptive Statistics for Different Age Group

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
<20	12	3.76	0.568	0.164	3.40	4.12	2.97	4.59
20>30	94	3.55	0.571	0.058	3.43	3.66	2.13	4.75
31>40	114	3.55	0.533	0.049	3.45	3.65	1.91	4.69
41>50	72	3.52	0.507	0.059	3.40	3.64	2.28	4.66
51>60	11	3.47	0.456	0.137	3.17	3.78	2.81	4.28
Above 60	6	3.55	0.650	0.265	2.87	4.24	2.84	4.53
Total	309	3.55	0.538	0.030	3.49	3.61	1.91	4.75

Source : Primary data computed using SPSS

Table-5: Results of ANOVA Test for Different Age Group

	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	0.650	5	0.130	0.445	0.817
Within Groups	88.537	303	0.292		
Total	89.187	308			

Source : Primary data computed using SPSS

Table-6: Results of Descriptive Statistics for Different Education Group

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
high school	54	3.40	0.720	0.098	3.21	3.60	1.91	4.75
Bachelor degree	149	3.58	0.474	0.038	3.50	3.66	2.41	4.63
post graduate	93	3.60	0.503	0.052	3.49	3.70	2.44	4.69
Others	13	3.46	0.540	0.149	3.13	3.79	2.63	4.38
Total	309	3.55	0.538	0.030	3.49	3.61	1.91	4.75

Source : Primary data computed using SPSS

Table-7: Results of ANOVA Test for Different Income Group

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	1.60	3	0.536	1.868	0.135
Within Groups	87.5	305	0.287		
Total	89.1	308			

Source : Primary data computed using SPSS