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THE MODERATING ROLE OF TECHNOLOGICAL INNOVATIONS ON THE RELATIONSHIP BETWEEN OPERATIONAL PERFORMANCE AND PATIENT SATISFACTION

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Abstract

The main purpose of this study is to explore the moderating role of technological innovations on the relationship between operational performance towards patient satisfaction. The study presented the first step towards a systematic and theoretical approach in understanding the patient satisfaction. To achieve this, the theory synthesizing and model approaches are adopted. Self-administrated questionnaires will be used to gather data. The findings highlighted that healthcare establishments need to focus on technology-based services due to the decreasing level of satisfaction when population rises. In order to cope with this issue, technological based management system and equipment's need to be introduced to enhance the operational performance of hospitals, which reduces the delays in treatment and ease the burden of practitioners. The strategy also brings improvement in patient care services and higher level of trust towards hospitals. The study also benefits scholars and open a new avenue for researchers and academia. The paper concluded that appropriate measuring protocols such as technology acceptance model (TAM) and technology readiness model (TRM) need to be incorporated to effectively gauge the effectiveness of the organizational performance and patient satisfaction in the light of technological innovation.

Keywords: *Technological innovation, Operational performance, Patients satisfaction*

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INTRODUCTION

Healthcare management tends to juggle with countless responsibilities and its associated risk in hospitals. However, one of the main concerns which cannot be neglected is, patient satisfaction. Chahal (2008), argued that patient satisfaction brings loyalty which shows the recurring visits of patients in future. In a similar way, the health of inhabitants is considered to an important indicator for growth and stability of nation, therefore the satisfaction of patient in a positive manner indicates the efficient service of hospitals (Ghosh, 2014), leading to effective performance of healthcare sector which ultimately improves the economy of country by providing reliable workforce (Simian, 2017). Ghosh (2014), further argued that patient satisfaction is an essential driver to survive in healthcare organizations and neglecting it means losing customer forever as well as questions the service quality of hospitals. Several authors referred patient's satisfaction as a key outcome of quality care and performance metric for health-care delivery (Donabedian, 1988; O'Connell, 1996).

Slack, Chambers & Johnstone (2010), discussed that operational performance which involves in high end quality services need to be measured closely by using resources efficiently and effectively because it directly affects satisfaction of patients and their loyalty. Furthermore, Chesbrough (2011) argued that technology innovation possesses the ability to provide competitive edge which is crucial for the survival and growth of any organization. Literature suggests that technology- driven innovations are crucial for service sector such as hospitals because introducing new devices and systems cloud computing, machine learning, data analytics, has an ability to increase overall performance which ultimately enhance patient's outcomes dramatically (Gupta, 2017; Sukkird & Shirahada, 2015).

Buttar (2016), anticipated that the role of artificial intelligence (AI) would expand eventually where avatars may enhance the operational performance of hospitals by analyzing patient's historical data and provide treatment accordingly. In addition, it will ease the burden of healthcare professional and simultaneously providing quality services which increase the satisfaction level. The development of mobile health (mHealth) application by United States Agency for International development (USAID) clearly shows that incorporating technological innovations enhance the service quality and maximize the output; accurate diagnosis, saves time, increase productivity and performance which eventually increase customer satisfaction level (Rakotoniaina, 2017). Another literature suggests that ICT-enabled innovations build a system through which patients are allowed to make decisions related to appointment of desired consultation even in the absence of medical staff (Josleyn & Raviscoini, 2017).

The well-being of inhabitants is perceived as a prime factor by many countries; therefore, it is ensured by healthcare professionals to deliver best of their services so that it may increase satisfactions of customers(patients). It also argued by researchers that country's growth can directly be affected by its GDP, health care and life expectancy (Simian, 2017). According to WHO statistics the healthcare spending in Malaysia is 3.86% of its GDP. The health care system of Malaysia is comprised of two sectors; government led public sector and private sector. The tax funded public sector is accessible to all the natives at heavily subsidized cost, whereas private sector is fee for service in which citizens have to pay for the services utilized by them. Due to these circumstances, an imbalance situation has been emerged which creates resistance in maximization of current available resources (Thomas, 2018).

According to ministry of health (2018), the Malaysian public healthcare lacks the proper distribution of medical personnel. Hence, appointments with doctors may take ages and delays the treatment procedures as well as patient's follow ups. The statistics further shows that 70% of healthcare in Malaysia is delivered through public

sector, which is served by only 45% of registered doctors. It can also be seen that due to this imbalance situation, public sector is overburdened and overcrowded which result delays in services, whereas private sector is underutilized. The overall situation of Malaysian healthcare depicts that despite of having qualified staff, the uneven distribution of services creates hindrance to achieve desired performance which ultimately affects the satisfaction of patients. Considering all the facts and figure, the present study attempts to propose the model that how the operational performance can be improvised if hospital administrators utilize technological innovations efficiently which results higher patient's satisfaction level.

Prior researches mainly explore the direct relationship of operational performance and patient's satisfaction. Hence, limited conceptual studies have been conducted to examine the role of technological innovations as mediator between operational performance and patient's satisfaction, Thereby, the present paper tries to explain theoretical framework which outlines technological innovations as moderator that may plays an important role between operational performance and patient's satisfaction and emphasize that incorporating technology in services and operations results higher level of patient's satisfaction. In addition, the study also tried to answer following questions. Research question for this study is does the operational performance impacts patient's satisfaction in the hospital? Does the role of technological innovation moderate the relationship between operational performance and patient's satisfaction in the hospital? For research objective, the objective of the study is to determine the effect of operational performance on patience satisfaction and to examine the moderating effect of technological invocation on the relationship between operational performance and patient's satisfaction.

METHODOLOGY

The main purpose of this study is to explore the moderating role of technological innovations on the relationship between operational performance towards patient's satisfaction, quantitative research and methodology is used. A self-administrated questionnaire has been used to gather data. The questionnaire will conceived based on a survey of previous literature and extracted from many published resources close to the current study.

The approach opted to design this conceptual research is the theory synthesizing and model. Cornelissen (2017), stated that model approach identifies the relationship between constructs and explains how these constructs leads to particular outcome during the whole process. This kind of approach is helpful when researcher attempts to build coherent argument on basis of different literatures relevant to the topic. Jaakkola (2020), explained that synthesized paper unveils a big picture by emphasizing on patterns and connections to offer logical argument.

RESULTS AND DISCUSSION

Operational Performance

Heizer & Render (2008) defined operational performance as the ability of hospitals due to which they are able to minimize management cost, improves service patterns by utilizing resource efficiently. Operational performance tends to increase production effectively and provide high quality service with highly expected return (Kaynak & Hartley, 2008). According to Kumar, Batista & Maull, (2011), Operational performance in hospitals is crucial determinant which indicates that how competently hospital administrators utilizing their resources in order to fulfill the needs and requirements of patients. Operational performance is the way to provide numerous enhancements in overall performance of hospitals like quality enhancement, cost minimization, reliable and speedy services and

convenience to patients (Heizer & Render, 2008; Kaynak & Hartley, 2008). According to Nunnally (1978), operational performance is an integration of multiple factors; quality service, improved delivery performance, productivity improvement.

Hospital Technological Innovation

Goes & Park (1997) perceived hospital technological innovations as a medical innovation which are adopted by hospitals to enhance the performance. Prior literature indicated that incorporating new medical technology in a service creates competitive edge and increase hospital's reputation (Dobrev, Kim & Carroll, (2002). Bokhari (2009), argued that adopting high technology medical equipment's make hospitals more proactive and efficient. Evans & Lindsay, (2002), explained in their work that hospital technological innovations are directly associated with treatments and diagnosis which helps health professionals to be more productive and thus, achieving the desired goal. Several scholars defined technological innovations in hospitals as modern equipped system and procedures which aims to improve performance of hospital by satisfying the needs of patient's (Hillman, Neu, Winkler, Aroesty, Retting 1987; Teplensky, Pauly, Kimberly, Hillman, Schwartz 1995; McDonald and Srinivasan, 2004).

Patient Satisfaction

The satisfaction of patient is a prime responsibility of healthcare administrators (HealthLeader Media, 2013). Abadi, Haming, Baharuddin & Mahmud (2018), viewed patient satisfaction as a feeling of joy or disappointment which a patient experience from the services provided by healthcare executives. Patients who are happy will feel satisfied and provide specific benefits to the hospital as patients more adhere to the doctor's advice on treatment, shorten the healing period, and improve health in general" (Ramli & Sjahruddin, 2015). Moreover, those patients who do not feel satisfied with the services they will generate complaints, leading to negative word of mouth and disloyalty which ultimately affect the reputation of hospital (Fatima, Malik & Shabbir, 2018). Bergel & Brock (2018), explained that customer satisfaction makes a huge contribution to switching barriers, switching costs and customer loyalty. Kotler & Keller (2006) referred patient satisfaction of healthcare services to patient experience which could be valuable (positive) or not valuable (negative). He further explained that the attitude of patient towards the services and treatment, provided to them, results satisfaction, or dissatisfaction.

Research Model & Hypotheses

In this era of technology, one cannot deny with the facts that innovation becomes a crucial strategy in any organization. If firms need to strengthen their competitive edge, they must incorporate technological innovations to sustain their reputation in the market and survive in this competition. From customer's perspective, it is also necessary that organizations deliver best to their customers so that it brings more loyalty and satisfaction and ultimately benefits organizations in terms of profitability. Similarly, in healthcare industry, there is also a need to focus on patient satisfaction. There are several reasons that why specifically in this industry patient satisfaction should be a prime focus.

Firstly, the health of well-beings is a main concern of any nation, healthy workforce means healthy nation which ultimately benefits the economy of country. Secondly, the negative experience leads to disloyalty which effects the reputation and profitability of hospital. Now we know that especially in healthcare, services are directly associated to patient's health that is why any misjudgment or error might lead to fatal consequences. It means there must be a high pressure on healthcare executives which sometimes affects overall performance in a negative manner. Therefore, it is necessary to utilize technological innovations so that health facilities would be able to

improve its overall operational performance which eventually increase the satisfaction level of patient. In present study, we conceptualize that technological innovation moderates the relation of patient satisfaction with operational performance.

The technology acceptance model (TAM) and technology readiness model (TRM) are the most successful theories in predicting the overall performance when technology is adopted. TAM deals with the given opportunities in terms of technological innovations to enhance the capabilities and makes improvement in work within less time and less effort (Davis & Bagozzi, 1989). Whereas TRM deals with the belief of a user about a technology which is being utilized, it could be positive or negative (Parasuraman, 2000). Both the theories recommend ways to increase customer satisfaction by improving performance with the help technology driven services. The hypothesis drawn conceptually in the light of academic literature and relevant theories (see Figure 1).

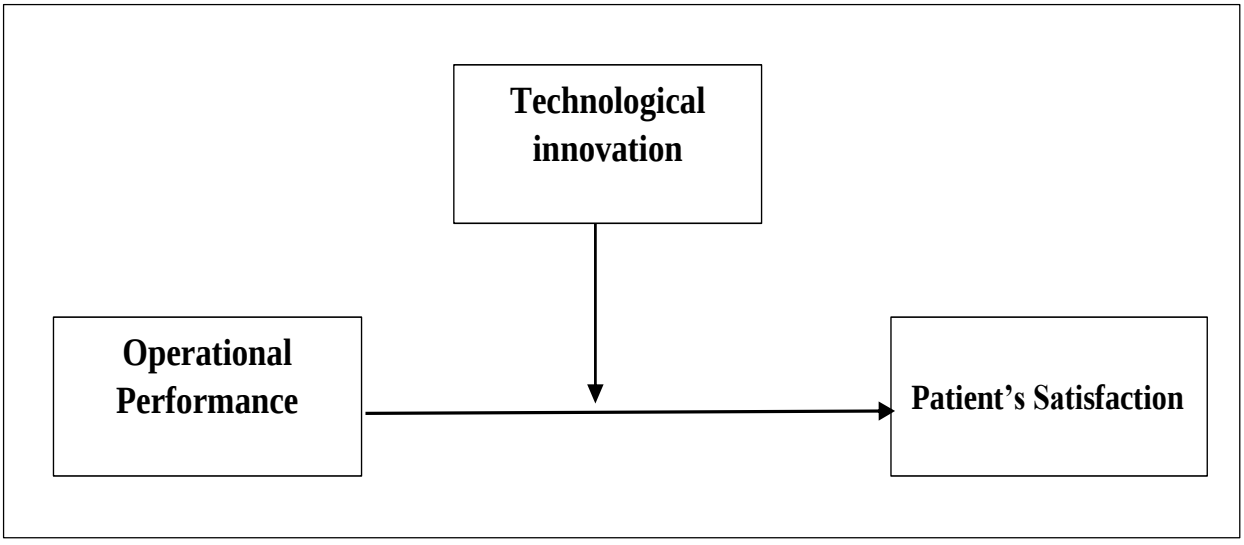

Figure 1: Research Model for the study

Operation Performance and Patient Satisfaction

H1: Operational performance has a positive impact on Patient satisfaction

Slack et al., (2010), argued that operational performance plays a significance role in healthcare industry. The reason is that it hugely effects the loyalty and satisfaction level of patients. An empirical study was conducted in Canadian hospitals, where it was observed that patient satisfaction is influenced by the services provided by health administrators (Leiter, 1998). Andaleeb (2001), discussed that patient satisfaction is influenced by five dimensions: responsiveness, assurance, communication, discipline and baksheesh.

Ghosh (2014), suggested in study that patient satisfaction should be a prime concern to survive in the industry because those hospitals who fail to deliver better services and don't cater the need of patients, they will eventually lose their customers forever. Ahmed, Tarique & Arif (2017), argued that healthcare providers should plan a standard procedure to promote reliable services because this is the only way to make your customer (patients) loyal and happy. Kumar et al., (2011), discussed that if a hospital really needs to meet the patient's expectation than they must be able to utilize the resources effectively and efficiently so that it can boost up the overall operational performance.

Moderating Effect of Technological Performance Between Operational Performance and Patient Satisfaction

H2: Technological innovations moderates the relationship between operational performance and patient satisfaction

Omachonu & Einspruch (2010), argued that in healthcare, technology is a backbone of innovation which brings operational benefits and in resulting higher patient satisfaction level. In transformative service organizations (i.e hospitals), technological innovation plays a significant role because it not only improves the overall performance but also enhance the consumer (patient) outcomes (Josleyn & Raviscoini, 2017; Rakotoniaina, 2017). Literature suggests that technology driven innovations are crucial for service sector such as hospitals because introducing new devices and systems i.e cloud computing, machine learning, data analytics, has an ability to increase overall performance which ultimately enhance patient's outcomes dramatically (Gupta, 2017; Sukkrid & Shirahada, 2015). The extensive use of technology-based products and service such as smart wheelchair, Bio Stamp, Pillcam etc. provide evidence of quality service care which strengthen the relationship of patient with healthcare executives.

Buttar (2017) anticipated that the role of artificial intelligence (AI) would expand eventually where avatars may enhance the operational performance of hospitals by analyzing patient's historical data and provide treatment accordingly. In addition, it will ease the burden of healthcare professional and simultaneously providing quality services which increase the satisfaction level. The development of mobile health (mHealth) application by United States Agency for International development (USAID) clearly shows that incorporating technological innovations enhance the service quality and maximize the output; accurate diagnosis, saves time, increase productivity and performance which eventually increase customer satisfaction level (Rakotoniaina, 2017). Another literature suggests that ICT enabled innovations build a system through which patients are allowed to make decisions related to appointment of desired consultation even in the absence of medical staff (Josleyn & Raviscoini, 2017).

Discussion, Implications and Future Recommendations

The present paper attempted to propose a concept that utilizing technological innovations improves the operational performance of hospitals and make the practitioners more productive which ultimately rise the satisfaction level of patients. After synthesizing prior literature and underpinning theories, research showed that there is a huge advantage associated with technological innovations. The technological innovation illustrated the significant benefit that further gives strength to relation of operational performance and patient satisfaction. The implementation of model encourages healthcare establishments in Malaysia to utilize appropriate technology as an aid for healthcare executives in order to maximize the performance with less delaying and effort because quality services are highly associated with patient satisfaction. The present study adopts TRM and TAM model which describes the potential role of technological innovation on increasing the performance level and patient satisfaction. Numerous examples and evidence shown in the light of theories and preceding literature that technology is the driven factor which boost the overall performance and has a great impact on patient outcomes.

The findings highlighted that healthcare establishments need to focus on technology-based services because the level of satisfaction decrease when population rises, so in order to cope up with the issue the technological based management system and equipment's need to be introduced to enhance the operational performance of hospitals which reduces the delays in treatment and ease the burden of practitioners. The strategy also brings improvement in patient care services and higher level of trust towards hospitals. The study also benefits scholars and open a new avenue for researchers and academia. Hospital management can also seek help from this study to take appropriate measures to enhance operational performance and improve service quality which adds value to hospitals and further satisfy the patients.

CONCLUSION

This comprehensive study and subsequent reflective analysis conclude that, operational performance and patient satisfaction for Malaysian health care sector enjoy a positive direct relationship, moderated by the effect of technological innovation. Health care sector being an important and crucial part of any economic system; will benefit if technology is incorporated into the system effectively in this age of information and technology. However, the health care professionals will need appropriate training to impart quality services through the to be incorporated technology. Such a change will not only reduce the load off the shoulders the health care professionals but will also reduce the wait time for the patients and hence will be beneficial in multiple ways. During the course of the study, it is also concluded that appropriate measuring protocols such as TAM and TRM need to be incorporated to effectively gauge the effectiveness of the organizational performance and patient satisfaction in the light of technological innovation.

The strategy also brings improvement in patient care services and higher level of trust towards hospitals. The study also benefits scholars and open a new avenue for researchers and academia. The findings highlighted that healthcare establishments need to focus on technology-based services because the level of satisfaction decrease when population rises, so in order to cope up with the issue the technological based management system and equipment's need to be introduced to enhance the operational performance of hospitals which reduces the delays in treatment and ease the burden of practitioners. Also, the Hospital management can also seek help from this study to take appropriate measures to enhance operational performance and improve service quality which adds value to hospitals and further satisfy the patients.

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