

Investigation on Service Supply Chain in Private Hospitals Malaysia

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Abstract

This study aims to study the effects of the determinants on service supply chain performance. 124 sets of questionnaires were distributed and 74 questionnaires were received with response rate of 59.68%. The findings show that: (i) the three determinants (people, process, and technology) have positive impact on service supply chain performance, both cost and quality (ii) all three control variables (hospital type, hospital size and hospital ownership) were found having no significant effect on all variables under study. This study highlighted that a good understanding of the key determinants for improving service supply chain performance, which will in turn, increases the supply chain productivity.

Keywords

Service supply chain performance, private hospitals, Malaysia

1.0 Introduction

Today, medical tourism is one of the fastest growing businesses in Asia. The competitive cost of the medical treatment in Asian countries in comparison to the developed countries has led to an increase in medical tourism in Asian countries. In Malaysia, private hospitals that are highly recognized for their world class standard healthcare service and competitive costs, in addition to their highly qualified medical professionals and skilled medical staff, have attracted an increasing number of patients each year. According to Ganesan (2012), 578, 403 of foreign patients have visited Malaysia in 2011, with total spending of RM509.77 million.

This has resulted in 34.5% increment in revenue and 47.2% growth in the number of patients as compared to 2010. In addition, a revenue of RM548 million and a total of 600,000 patients is projected as a result of medical tourism in 2012. Today, hospitals are under enormous pressures due to the fact that compensation and revenue are decreasing whereas costs are rising. A few challenges have been faced by the health care sector lately, which include the increasing costs of medication and equipment, increasing demand of quality healthcare and sophisticated equipment, as well as changing patterns of diseases which will inevitably result in a higher healthcare cost in future (Ministry of Health Malaysia, 2011). According to the Star reported on 2009, the healthcare costs in Malaysia has increased 10 percent each year, outpaced the general inflation rate. To reduce costs, various cost cutting campaigns have been implemented. While costs are reduced, diminishing returns are observed and their profits margin continues to shrink every year. This article intends to increase the understanding of service supply chain concept among private hospitals in Malaysia, which can help to retain costs, improve profitability while determining the true performance of the supply chain.

2.0 Literature Review

2.1 Determinants for Supply Chain Productivity

McCrea (2010) suggested that the best practices in supply chain productivity consist of three elements: people, process, and technology, which are vital, yet frequently overlooked.

2.1.1 People

Liu et al. (2007), Normala Daud (2006), and Stavrou, Charalambous and Spiliotis (2007) have positively linked human resource management to organizational performance. Tsaur and Lin (2004), Stavrou et al. (2007), Bayo-

Morioness and Merino-Diaz de Cerio (2002) reported that human resource management is positive associated with quality performance, while Banker, Lee, Potter and Srinivasan (2001), and Li and Benton (2006) has reported a positive relationship between human resource management and cost performance. Human resource management is also found to be positively related to a firm's revenues and profitability, which ultimately increase the productivity (Liu et al., 2007; Cho, Woods, Jang, & Erdem, 2006; Schuler, 2000). Effective human resource management can also resulted in higher productivity as reported by Stavrou et al. (2007), and Bayo-Moriones and Diaz de Cerio (2002).

2.1.2 Process

Process is typically defined as a particular course of action intended to achieve a result. A process is important as it determines the results obtained. In health care industry, process improvement is crucial for lowering costs and improving services. Neumann (2003), Reiner (2005), and Toba, Tomasini, and Yang (2008) suggested that the biggest opportunities to reduce costs and improve operations come from addressing processes involved with product management, sourcing and contracting, purchasing and payment cycle, and inventory and distribution management. Product management involves standardization of supplies (Neumann, 2003; Carey, 2008), and supply formulary development and maintenance (Lee Ventola, 2008; Franklin, 2003).

2.1.3 Technology

Technology is often related to good supply chain performance (Goldstein, Ward, Leong & Butler, 2002). However, when studying the impact of technology on health care costs, many assumed that technologies are costly and can cause a rise in costs. Nevertheless, Spetz and Maiuro (2004) viewed that some technologies could be cost-reducing, and even without the use of new devices or technologies, some services could be very expensive (Spetz & Maiuro, 2004). According to Mas and Seinfeld (2008), cutting back on new technologies adoption can reduce health care costs in the long run. However, it may also lower the technological innovation level, and impact the quality of patient care. Based the previous research (Li & Benton, 1996; Li and Benton 2003; Li & Benton, 2006), a direct association was found between hospital technology, cost and quality performance. Kamaruddin and Udin (2009), as well, hold the view that technology is critical to reduce costs and enhance competitiveness.

2.2 Service Supply Chain Performance

Consistent with the studies of Li, Benton, and Leong (2002), Li and Benton (1996), and Li and Benton (2003), cost and quality are used as the metrics to measure supply chain performance in hospital, with the aim of delivering high quality health care service to general public at an affordable price.

2.3 Framework

Through literature review, three key determinants of the supply chain have been identified, which include people, process and technology. The effects of the three key determinants towards the service supply chain performance (cost and quality) among the private hospitals in Malaysia. The control variables selected for this framework are hospital type, hospital ownership, and hospital size.

H1: The determinants have positive impact on the service supply chain performance

3.0 Methodology

3.1 Research Design

The unit of analysis in this study is the individual hospital. This study focuses on the population of private hospitals in the hospital industry in Malaysia. According to the Association of Private Hospitals Malaysia (APHM), there are 124 private hospitals in the hospital industry throughout Malaysia to-date. The mail method is used in this study since it covers wider geographical area with reasonable time and least cost.

4.0 Analysis

4.1 Response rate

A total of 124 questionnaires were posted to the respondents. 76 questionnaires were returned after two reminder letters were sent in addition to telephone calls and emails. Out of the 76 questionnaires received, 74 respondents have completed answering the questionnaire while 2 respondents did not. The 2 uncompleted questionnaires were then being rejected. The overall response rate is 59.68%. For comparison, a survey on the effect of location, strategy, and operations technology on hospital performance conducted in hospitals in the United States by Goldstein, Ward, Leong and Butler (2002) have managed to receive a response rate of 41.9% (total of 61 completed questionnaires out of 160 questionnaires sent) while Li, Benton and Leong (2002) received 151 completed questionnaires out of 492 questionnaires set, resulted in response rate of 30.7% when

conducting survey on the impact of strategic operations management decisions on community hospital performance in the United States. Thus, the response rate (59.68%) obtained in this study is acceptable.

4.2 Descriptive Analysis

Table 1 illustrates the descriptive statistics for the three determinants of supply chain productivity. It is observed that most hospitals in the study tend to agree that people is the key determinant of supply chain productivity (mean=3.87, standard deviation=0.64). In other words, it shows that most hospitals are highly aware of the importance of human resource management in improving the supply chain productivity, hence, have carried out necessary actions towards better human resource management. The hospitals also tend to agree that both process and technology play a significant role in enhancing the supply chain (Process: mean = 3.73, standard deviation = 0.63; Technology: mean = 3.68, standard deviation = 0.63).

Table 1: Descriptive Statistics of Supply Chain Productivity Determinants

Variables	Mean	Standard Deviation
People	3.87	0.64
Process	3.73	0.63
Technology	3.68	0.63

Note: The variables used a 5-point Likert scale with (1 = strongly disagree, 5 = strongly agree)

4.3 Descriptive Analysis of Service Supply Chain Performance

Table 2 presents the descriptive statistics for the two types of service supply chain performance including cost and quality. The table reveals that the service supply chain cost performance is the highest (mean=3.82, standard deviation=0.68), followed by the service supply chain quality performance (mean=3.73, standard deviation=0.70). Based on the result obtained, the sampled hospitals have high level performance in both cost and quality.

Table 2: Descriptive Statistics of Service Supply Chain Performance

Variables	Mean	Standard Deviation
Cost	3.82	0.68
Quality	3.73	0.70

Note: The variables used a 5-point Likert scale with (1 = not at all, 5 = very high extent)

4.4 Correlation Analysis

Correlation analysis was performed in this study to determine the inter-correlations and identify multicollinearity among the variables under study. Table 4 reveals that the correlation coefficients among the determinants range between 0.014 and 0.096, among service supply chain performance (cost and quality) is 0.28, and all correlation coefficients are positive which define a positive direction of the relationship.

Table 3: Pearson Correlation Coefficient for all Variables under Study

Variables	PL	PC	TG	C	Q
People (PL)	1.000				
Process (PC)	0.096	1.000			
Technology (TG)	0.014	0.084	1.000		
Cost Performance (C)	0.274**	0.276**	0.325**	1.000	
Quality Performance (Q)	0.218*	0.284**	0.379**	0.278**	1.000

Note: *p<0.05, **p<0.01

From Table 3, it is observed that the three determinants are significantly correlated with service supply chain performance in terms of cost and quality ($0.22 \leq r \leq 0.38$, $p < 0.05$). The service supply chain cost performance is also found to have significant correlation with supply chain productivity ($r=0.411$, $p < 0.01$).

4.5 Tests for Hypothesis

Table 4 presents the result of the two-step regression analysis of the control variables and determinants on service supply chain cost performance. The results from step one indicates that none of the control variables (hospital type, hospital ownership, hospital size) have significant impact on service supply chain cost performance. The total variance in service supply chain cost performance explained by the control variables is only 1.7% and the model as a whole is not significant ($F=0.404$). At step two, by adding the three determinants into the model, 25.3% of the total variance in service supply chain cost performance has been explained and the model becomes significant ($F=7.053$, $p<0.001$). The result also shows that the three determinants have

significant impact on the service supply chain cost performance. Looking at the three determinants, it is observed that technology has the most significant impact on service supply chain cost performance ($\beta = 0.285$, $p < 0.05$), followed by people ($\beta = 0.270$, $p < 0.05$), and lastly process ($\beta = 0.253$, $p < 0.05$). The results supported the hypotheses H1.1a (people have a positive impact on the service supply chain cost performance); H1.2a (process has a positive impact on the service supply chain cost performance), and H1.3a (technology has a positive impact on the service supply chain cost performance).

Table 4: Multiple Regression Result for Effect of Determinants on Service Supply Chain Cost Performance

Variables	DV: Service Supply Chain Cost Performance	
	Step 1 (Model 1)	Step 2 (Model 2)
	Std. Beta	Std. Beta
<i>Control Variables:</i>		
Hospital Type	0.023	0.068
Hospital Ownership	-0.096	-0.034
Hospital Size	-0.075	-0.131
<i>Independent Variables:</i>		
People		0.270*
Process		0.253*
Technology		0.285*
R ²	0.017	0.253
Adjusted R ²	-0.025	0.186
F	0.404	7.053***

Note: * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$; Model 1 = Control variables were regressed on DV; Model 2 = Control Variables and IVs were regressed on DV

5.0 Discussions

5.1 Effect of Service Supply Chain Performance

The results of the regression analysis indicated that the service supply chain cost performance have significant effect on supply chain productivity (H2.1). This finding was supported by the literature reviews from Li et al. (2002), who have reported a positive relationship between the hospital's cost performance and its financial performance which includes operating profit, return on assets and return on investment. Given that the supply chain productivity is positively related to revenues and profits but negatively related to costs, an increase in revenues and profits, as well as a decrease in costs can ultimately lead to higher supply chain productivity.

5.2 Effect of Control Variables

Three control variables were included in this study in order to test the real effect of the studied variables as they may affect the outcomes of the study. The control variables are hospital type, hospital ownership, and hospital size which is indicated by the number of beds in hospitals. The results from the regression analysis indicated that the hospital type, whether profit or non-profit, does not have any significant impact on the relationship between the variables under study. Hospital size, as well, depicted no significant impact on the studied variables relationships. Lastly, hospital ownership, whether locally owned, joint venture, or foreign owned, does not have significant impact on the relationship between the variables under study.

5.3 Conclusion

The study indicated that the private hospitals in Malaysia have implemented high level performance in terms of supply chain. By reviewing the determinants for supply chain which comprises people, process and technology, significant association were found between the determinants and the service supply chain cost and quality performance. In other words, the determinants have significant positive impact on the service supply chain performance. The result provides an input to the hospital management team to pay more attention on process improvement in order to achieve higher level performance in supply chain. In terms of service supply chain performance, more attention should be paid on technology enhancement.

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