

EFFECT OF SUPPLY CHAIN MANAGEMENT ON PERFORMANCE IN SELECTED PRIVATE HOSPITALS IN ILORIN, NIGERIA

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Abstract

There has been increasing Patients' dissatisfaction about health care service delivery in most private hospitals in Nigeria due to the quality of health care services provided to patients. The objective of this paper is to examine the effect of supply chain management on hospital performance in Ilorin, Nigeria. The quantitative research approach and the descriptive study design were adopted for the study. The simple random sampling method was used to select respondents from ten, out of fifty-eight, private hospitals in Ilorin. The study employed the Partial Least Squares method in the estimation of the Structural Equation Model's effect in Supply Chain Management (SCM) on Hospital performance. Results indicate that SCM has no strong and direct impact on Hospital performance, but has indirect impact on performance through Competitive Advantage. The paper concludes that an efficient SCM will result in more Patient Satisfaction and better Competitive advantage. It is recommended that Private hospitals should not depend on single suppliers. They should engage more reliable suppliers that would be closer to them for better medical procurement and supplies to be achieved.

Keywords: supply chain; drugs; private hospitals; patient care; procurement, structural equation model; hospital performance.

1. Introduction

Supply Chain Management (SCM) is one of the important functions that need to be performed efficiently in every business. Organizations have now realized that their success depends on their capacity to design and manage their SCM system effectively, in order to reap maximum

benefits and sustain their competitive advantage (Lenin, 2014). This situation is also the same in the health care industry where there is high competition and sharp rise in price in almost all products and services. The Healthcare industry has become one of the fastest growing industries in the service sector, with most hospitals, except few highly specialised ones, providing similar types of services (Turkyilmaz, Bulak & Zaim, 2015).

These Hospitals strive to achieve service excellence and retain every customer that they can profitably serve. In other words, they try to achieve zero defects through a continuous effort to improve the quality of their service delivery system. Thus, Hospitals need to pay attention to critical approach, which is a health care supply management, to be more competitive and successful (Lillrank, Groop & Venesmaa, 2011; Turkyilmaz, Bulak & Zaim, 2015). The challenges facing the healthcare sector include increasing costs of medication and equipment, increasing demand of quality health care, sophisticated equipment and the changing patterns of diseases, which result in higher health care cost. The health care organizations, therefore, need to adopt a system that will enable them to deal with these challenges and gain customers' satisfaction. This also requires the private hospital administrators employing supply chain management to promote the advancement of healthcare (Toba, Tomasini & Yang, 2008; Ali, Alolayyan & Idris, 2012; Hong, Kim & Dobrzykowski, 2012; Pheng, Hamdani & Zailani, 2014). The Supply Chain, being a significant driver of cost in the health industry, has become an important issue which attracts attention from the industry's stakeholders. SCM is now regarded as having an important impact on reducing costs and improving performance in health care organizations (Mathew, John & Kumar; 2010; Christos, Vicky & Constantinos, 2014). According to Lenin (2014), due to the rapid advancement in medical technology and life sciences market, the healthcare supply chain is under severe pressure.

The health sector comprises various sectors such as pharmaceutical, medical equipment and supplies, and health care services. The industry's size and velocity make the management of its supply chain complex (Christos, Vicky & Constantinos, 2014).

In this study, the focus is basically on selected Private hospitals in Nigeria. There have been declines in the quality of services provided by Public owned Hospitals, which has led to more demand for health services in Private Hospitals. There is a general belief that private hospitals are having high-level performance in terms of supply chain than the public-owned ones. In other words, services offered by Private hospitals are superior to those of the Public Hospitals (Polsa et. al., 2011). For example, private hospitals that are recognised for their world class standard health care services in Malaysia have attracted an increasing number of patients each year (Pheng, Hamdani & Zailani, 2014). Patients attach more importance to the quality of healthcare services received and they are ready to abandon free health care services in public hospitals for expensive better health care in Private hospitals ((Ramsaran-Fowdar, 2005; Butt & de Run, 2010; Kanyoma & Khomba, 2013).

In Nigeria, there is persistently low quality and inadequate health services provided in public facilities, which have made the private sector an unavoidable choice for consumers of health care (Ogunbekun, Ogunbekun & Orobato, 1999). Also, in a similar study done by Polsa, Spens, Soneye and Antai (2011), it was revealed that the patients perceived private hospitals to be more dependable than public hospitals. However, the study done by Basu, Andrews, Kishore, Panjabi and Stuckler (2012) revealed that, when the private sector included unlicensed physicians, it provided the majority of coverage for low-income groups, but when only licensed providers were included, the public sector was the main source of healthcare provision in low- and middle-income countries. This gave a different result from the earlier ones considered, but, to a certain extent, the various studies examined have shown that the Private Hospitals are significant alternatives to the Public Hospitals. SCM is defined as a way to envision all steps needed to deliver products or services to the customers (Meijboom, Schimidt-Bakx & Westert,

2011). The procurement and supply chain management functions play an important role in health care delivery and its failure can result in sabotage in the organizations (Kumar, Ozdama & Zhang, 2008; Kayoma & Khomba, 2013).

In the healthcare industry, procurement operations associated with Pharmaceutical products can affect the standard of care for Patients. It also affects the inventory level and it is, therefore, prudent that some minimum stock of medical supplies be kept in hospital. This is because controlling logistics in the health sector will improve patient safety (Pan & Pokharel, 2007; Kumar et al., 2008; Mustaffa & Potter, 2009). Inefficient processes and delayed delivery or stock out of medical supplies may affect both the efficiency and effectiveness in hospitals (Kumar, De Groot & Choe, 2008; Mustaffa & Potter, 2009).

Procurement, therefore, plays a key role in the value chain for health care delivery in hospitals (Aronsson, Abrahamsson & Spells, 2011; Kanyoma & Khomba, 2013). The objectives of SCM in organizations are: to improve the quality of the goods and services, to increase customer service, to reduce waste and non-value added activities, including excess inventory, to improve supply chain communication, reduce cycle time and satisfy the customer (Kauffman, 2002; Lenin, 2014). However, the main challenge in the healthcare supply chain management is the achievement of improved performance and service (Lenin, 2014). The increasing importance of private hospital as an alternative source of healthcare delivery not only in developed, but also in developing countries, motivates this study. The focus of research on SCM in the last two decades has been in the manufacturing industry, but there is now a change of focus to healthcare supply chain management; thus, making healthcare supply chain to be in its early stage of development (Shou, 2013). The majority of the works done in this area used the qualitative and case study approach, while few scholars used questionnaire surveys and quantitative approaches (Kim, 2005; Kumar, Ozdama & Zhang, 2008; Mustaffa & Potter, 2009; Shou, 2013). This study differs from the other studies because it examines the effect of SCM on Patient health care delivery in selected private hospitals in Nigeria. A greater number of studies have been on healthcare qualities, workers' attitude, facility location, government spending on healthcare, service provision and disease prevalence (Mills et. al., 2002; Tuan et. al., 2005; Polsa et.al., 2011). The study also used the Partial Least Squares method in the estimation of the Structural Equation Model's effect of SCM on Patient health care delivery.

2. Literature Review

2.1. Conceptual Definition

There are various definitions of SCM. In this study, two of these definitions will be discussed. The Council of Logistics Management (2000) defines SCM as the systematic, strategic coordination of the traditional business functions within a particular organisation and across businesses within the supply chain for the purposes of improving the long-term performance of the individual organizations and the supply chain as a whole.

The definition considers SCM as a business function which takes place, both within and outside a particular organisation, for the purpose of bringing about its improved performance and supply chain decisions. According to Shou (2013), SCM in hospitals involves both the internal and external chain. The internal chain includes patient care unit, hospital storage and patient etc, while the external chain includes the vendors, manufacturers, distributors, etc. The SCM processes in healthcare are physical product, information, and financial flow. The physical product flow helps in managing customised products and services for the treatment of

patients. The information and financial flows are for effective product flow and improved organizational performance (Lee, Lee & Schniederjans, 2011).

Chopra and Meindl (2007) define SCM as the management processes of flows of goods, information and funds among supply chain partners in order to satisfy consumer need in an efficient way. This definition examines SCM from three key functions performed by the supply chain partners, which are the flow of physical product, the information, and financial flow. The supply chain partners are expected to perform these functions in order to satisfy customers and achieve improved organizational performance. SCM has been regarded as the key to building sustainable competitive edge by organizations for their products and services in an increasingly crowded market place (Jones, 1998; Li, Ragu-Nathan & Rao, 2006). The key players in Healthcare Supply Chain are the producers, purchasers, providers and patients (Burns, De Graaf, Danzon, Kimberly, Kissick & Pauly, 2002). The producers are those who manufacture products, such as pharmaceuticals, medical devices, and implants, medical and surgical supplies. Purchasers are group purchasing organizations (GPO) and distributors who arrange the payment and shipment of goods from the producers to the providers.

The providers include the hospitals, clinics, pharmacies and physician offices. Patients are the households who seek medical care from the hospitals (Smith, Nachtman & Pohl, 2012; Turkyilmaz, Bulak & Zaim, 2015). The following are given as dimensions of health care SCM: relationships with suppliers, compatibility, specifications and standards, delivery and after-sales service (Al-Saa'da et al., 2013).

Patient care delivery system involves organising the activities of the health staff into a workable pattern to meet patient needs (Ezzat, 2007). In other words, Patient Care is the various measures taken by the Health Staff that is aimed at alleviating patient illness and creating optimum conditions for treatment (Dehktiar, 1974). It has been shown that the main concern about healthcare SCM is on its performance, and a key measure for healthcare supply chain is patient satisfaction. A study conducted in South Korea further showed that customer satisfaction in the health care industry is positively related to supply chain performance (Kim, 2004; Shou, 2013). This means that, when there is an efficient health care, supply chain management will bring about better hospital performance and patient satisfaction.

Brown, Franco, Rafeh and Hatzell (1998) describe nine quality dimensions of health service delivery that lead to patient satisfaction. These dimensions are: effectiveness, efficiency, technical competence, interpersonal relations, and access to service, safety, continuity, and physical aspect of health care. Hospitals are making efforts to ensure that quality care is delivered to the patient in order to influence outcomes with respect to hospital performance and patient satisfaction. It is only when patients enjoy quality health care that they can become satisfied and this will also lead to better hospital performance (Jiang, Friedman & Begun, 2006; Toba, Tomasini & Yang, 2008). According to Li et al. (2006), SCM practices impact not only overall organizational performance, but also competitive advantage of an organization. Organizational performance has been described as how well an organization is able to achieve its market-oriented goals as well as its financial goals (Yamin, Gunasekruan & Mavondo, 1999). The short-term objectives of SCM are increased productivity and reduced inventory and cycle time, while long-term objectives are in a form of increased market share and profits for all members of the supply chain (Tan, Kannan & Handfield, 1998). Traditionally, business performance was based on financial metrics such as profit, market share, and revenue growth, but a study has shown that financial indicators are measures of past performance only and may not be a good measure of future performance. The inclusion of non-financial indicators, such as: service quality as perceived by customers, reputation, capacity, market orientation, market development, etc., helps a firm overcome this shortcoming (Kaplan & Norton, 1998; Bulak & Turkyilmaz, 2014).

Competitive advantage is described as the extent to which an organisation is able to create a defensible position over its competitors (Porter, 1985; McGinnis & Vallopra, 1999). This makes an organization have capabilities to differentiate it from other competitors through its critical management decisions (Tracey, Vonderembse & Lim, 1999; Li et al., 2006).

There are empirical studies which have identified price/cost, quality, delivery, and flexibility as important competitive capabilities for organizations (Skinner, 1985; Roth & Miller, 1990; Tracey, Vonderembse, Lim, 1999). Also, time-based competition has been included as an important competitive priority (Stalk, 1988; Vesey, 1991; Handfield & Pannesi, 1995; Kessler & Chakrabarti, 1996; Zhang, 2001). The extant literature has shown that SCM has an influence on both performance and competitive advantage of an organization. Therefore, in relation to this study, SCM could be said to have influence on both the hospital performance and its competitive advantage.

The previous studies on SCM include: the factors between weaknesses in the supply chain and operational performance of American companies (Hendricks & Singhal, 2005). The result revealed that the return on sales and assets have the most important impact on operational performance. Shah, Goldstein, Unger and Henry (2008) examine the field approach to the study of how healthcare supply chain increases performance by decreasing service time and increasing service quality in a decentralised network of health care providers. The result of their study shows that the use of lean principles can guide process improvement efforts. Al-Saa'da, Taleb, Abdallat, Al-Mahasneh, Nimer and Al-Weshah's (2013) study considers the effect of the SCM on health care service quality in Jordanian Private Hospitals. They found that there was a significant effect of SCM dimensions on the quality of health services. There is also a study on Assessment of Total Quality Management (TQM) practices as a part of SCM in Health Care Institutions by Turkyilmaz et al. (2015). The study revealed that TQM practices do not have direct influence on financial performance, but have indirect influence on non-financial performance. Out of all these studies considered in this paper, only that of Turkyilmaz et al. (2015) made use of Partial Least square methods to estimate the relationship between factors used for the selected health care Institutions in Turkey. This trend further confirms that few scholars used quantitative approach, such as Structural Equation Model, for the study of SCM and healthcare industry (Kim, 2004; Lee, Lee & Schniederjans, 2011). In terms of procurement practices, it has been shown that there are significant differences between the public and private sector. The public sector almost relies on transactional-based approaches and the restrictions placed on its procurement practices result in sub-optimal outcomes (Lian & Laing, 2005). The hospitals need to maintain an efficient inventory of drugs and medical supplies in order to meet emergency demands, but this may result in increased costs. There is also increasing supply chain problems as a result of drug shortage, which lead to additional costs for hospitals and drug counterfeiting, which poses serious threat to patient safety (Chen, 2013; Christos, Vicky & Constantinos, 2014).

The Nigerian health services are built on three levels, which are Primary, Secondary and Tertiary Care. The Local Governments are responsible for Primary health care services, which provide health education, safe water and sanitation, reproductive health, immunization against major infectious diseases, provision of essential drugs, mental and dental care. The State Governments manage the health care services at the Secondary level. The secondary level provides health care services at a higher level than that of the primary health care facilities. They provide specialized services, such as laboratories, diagnostics, general, medical and surgical, to referred patients from the primary health care facilities. The tertiary health care services represent the highest level of health care services in the country and it is administered by the Nigerian Federal Government. They provide highly specialised health care services in orthopedic, psychiatric, maternity and pediatric specialties (Polsa et. al., 2011; NBS, 2012).

There were 34,020 hospital facilities in Nigerian as at 2011 (NBS, 2012). The health care facilities comprised of 23,450 Public hospital facilities and 10,570 Private hospitals, as shown in Table 1.

Table 1 – Health Care Facilities in Nigeria as at 2011

Types	Public	Private	Total
Primary	21,808	8,290	30,098
Secondary	1,569	2,270	3,839
Tertiary	73	10	83
Total	23,450	10,570	34,020

Source: National Bureau of Statistics, 2012.

This has reflected the upward number of the health care facilities established in Nigeria in recent time (Coker & Sridlar, 2010). The health care facilities are mostly located in urban areas, which resulted to restrict access to health care delivery in rural areas. This situation had led to the predominance of traditional healers and private health care facilities in the rural areas (Polisa et.al., 2011).

This study, therefore, in addition to the objectives earlier stated, examines the relevance of private health care facilities in meeting the health needs of these rural dwellers. They usually come from the village to visit the private health facilities for their medical treatments. This literature on SCM has shown, to a great extent, how significant it is to the health care industry and other stakeholders.

2.2. Theoretical framework to the study

According to Halldorsson, Kotzab, Mikkola and Skjøtt-Larsen (2007), there are four theories of managing supply chains and these include: the Principal Agent Theory, Transaction Cost Analysis, the Network Theory and the Resource Based View (RBV). The Principal agent theory is all about mitigating agency problems that may arise in organizations. Transaction cost analysis is about transferring rights of disposal in inter-organizational arrangements. The Network theory is concerned with reciprocated interactions between institutions, while the resource based view is concerned with the coordination of relational assets in the organization. Halldorsson et. al. (2007) stated that there is no such thing as a unified theory of SCM. They further said that, depending on the situation, one can choose one theory as the dominant explanatory theory and then complement it with one or several of the other theoretical perspectives. In this study, the RBV is adopted, because it is one of the grand theories of economics and pays attention to the achievement of a competitive advantage through internal resources (Bohnenekamp, 2013). The RBV examines the link between a firm's internal characteristics and performance. There is a need for a firm's resources to be valuable, rare, inimitable and non-substitutable for it to create a competitive advantage (Dierickx & Cool, 1989; Barney, 1991; Petraf, 1993). The RBV also assumes that activities leading to competitive advantage should be maintained in house and less important items sourced externally (Bohnenekamp, 2013). In other words, outsourcing decisions or supply management decisions are based on the idea of focusing on core competencies and outsourcing complementary competencies to external partners (Halldorsson et. al., 2007). The RBV theory, thus, serves as appropriate and relevant to this study. The following hypotheses are, therefore, raised in this study:

H1: Supply Chain Management has a weak impact on Patient Satisfaction.

H2: Supply Chain Management has a strong direct impact on Hospital Competitive Advantage.

H3: Supply Chain Management has a strong and direct impact on Hospital performance.

H4: Patient Satisfaction has a strong direct impact on Hospital Performance.

H5: Competitive Advantage has a strong direct impact on Hospital performance.

3. Methodology

This is a descriptive and quantitative study which examines the impact of SCM on patient care delivery. The study has been different from other studies, because it used the Structural Equation Model-Partial Least Square method (SEM-PLS) to measure the impact of SCM on Patient health care delivery in Ilorin, Nigeria. The SEM-PLS approach enables the simultaneous examination of a series of interrelated dependence relationships between a set of constructs, represented by several variables while accounting for measurement error. This attribute has contributed to its widespread application in business research (Sarstedt, Ringle, Smith, Reams & Hair, 2014). Ten private hospitals were selected, out of the total 58 that were functioning in Ilorin, Nigeria (Akanke & Monehin, 2004; Gbadeyan, Raheem & Abdullahi, 2014) as sample for the study. The hospitals were randomly selected based on their geographic spread, years of existence, size and quality of services offered to patients. The selected hospitals include: Abanishelolu hospital, Olalomi hospital, Omolola hospital, Ola Olu hospital, Kiddies Medical Centre, Olanrewaju hospital, Olotu hospital, Eytayo clinic, Ella hospital and Surulere Medical Centre.

The study was conducted from March 7th to March 21st, 2016. This study was carried out to evaluate the impact of SCM in these hospitals on patient satisfaction, competitive advantage and performance, using the Partial least square - Structural Equation model approach.

The instrument which measures SCM was developed from the study done by Al-Saa'da et.al. (2013). Competitive advantage and organizational performance measures were adopted from Zhang (2001).

The patient satisfaction measures were developed from Brown et.al (1998). There were minor modifications made to the original version of these instruments to arrive at the final form used for the study. The questionnaire consisted of two sections: Sections A and B. The first section (i.e. Section A) has 13 questions, while Section B has 25 items, making a total of 38 items. Section A provides information on the characteristics of the sampled private hospitals, while Section B contains measurement instrument for the patient care delivery and SCM. The questionnaire is shown in the Appendix. Twenty questionnaires were administered by simple random method to each private hospital to collect data from the Medical directors, staff in charge of procurement, suppliers and patients. The Medical directors in these private hospitals helped in providing information about their hospitals and suppliers. The questionnaires were distributed to the patients during hospitalisation. A total of 173 questionnaires, out of the 200 administered, were filled in and returned, which represents 86.5% rate of return. Each item for the Section B instrument was rated on a 10 scale point with 1 = minimum and 10 = maximum. The questionnaires were pretested several times to ensure the appropriateness of the wordings used. The judgemental measures were used to collect information about the financial performance, because most hospitals are not willing to disclose their financial position. This is

done because the judgemental method had been used in similar past study (Turkyilmaz et al., 2015).

4. Results and Discussion

The breakdown of the sampled population revealed that 5.8% of the respondents were the Medical directors of the Private Hospitals, 11% of the Health Staff were in charge of the procurement and supply for the hospitals, 12.7% of the respondents were Suppliers and 70% of the respondents were the Patients who participated in the survey for the study. The respondents' distribution is shown in Table 2.

Table 2 – Respondents' Distribution

	Frequency	Percentage
Medical Directors	10	05.8
Procurement Staff	19	11.0
Suppliers	22	12.7
Patients	122	70.5
Total	173	100.00

Source: Authors' field survey, 2016.

In 70% of the hospitals selected for the study, it was found that all the medical directors and the procurement staff are involved in supply chain decisions, while in 30% of the Private hospitals, only the medical directors are involved in SCM decisions. The Procurement staff members are mostly either Nurses or Doctors assigned by the Medical Directors to carry out this responsibility for the hospitals. This revealed that most of those involved in Supply Chain decisions are not those who are professionally trained or graduates with a Supply Management degree or diploma certificate. The average number of suppliers for the selected hospitals are two, 40% of the Hospitals had three suppliers, while 20% of the selected hospitals rely on a single supplier. This makes most of the hospitals to be able to meet up with the supply for drug orders. The Patients form the greatest proportion of the sample; they were 70% of the total respondents considered for the study. The detailed information about the hospitals selected for the study and respondents' distribution is shown in Table 3. It is shown in the table that the number of beds for the hospitals ranges from 30 to 69. The number of Doctors is from 2 to 5, while Staff Nurses are from 7 to 15. The Administrative Staff are between 3 to 5 and suppliers for the hospitals range from 1 to 3. This information shows that most of the hospitals were small and medium-sized in nature. The respondents were also fairly distributed across the selected hospitals.

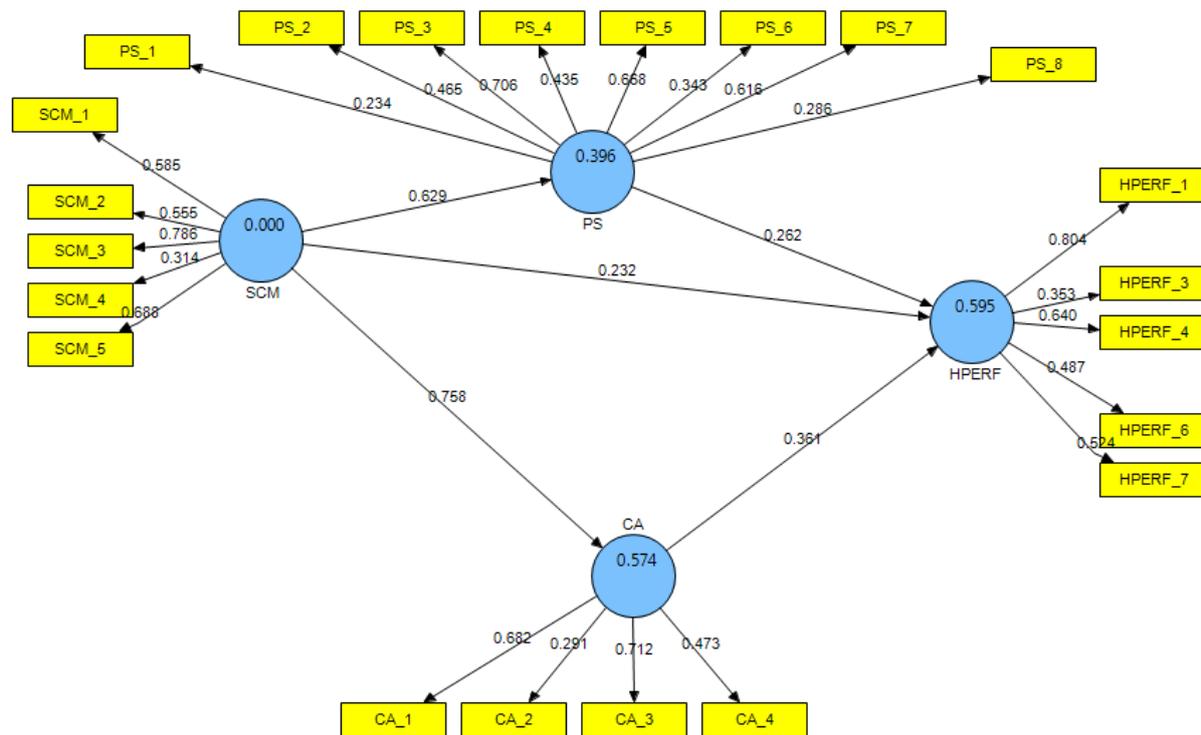
Figure 1 shows the Structural Model for the study. The Partial Least Squares (PLS) approach was utilized to test the hypothesized relationships developed for the study. The internal consistency reliability for the model, as shown in Table 4, indicated that the composite reliability for the latent variables used range from 0.6313 to 0.7307, which is considered acceptable for this type of study. The Composite Reliability is superior to the Cronbach's Alpha. This is because the Cronbach's Alpha assumes that the measurement item load equally on the construct, which is clearly not the case of the measurement model (Hair, Ringle & Sarstedt, 2011).

Table 3 – Detailed Information about Selected Private Hospitals

S/N	Number of Doctors	Number of Nurses	Number of Administrative staff	Number of suppliers	No of beds	No of respondents sampled	% distribution of respondents
1	2	10	3	2	32	18	10.40
2	5	14	4	3	58	20	11.56
3	3	15	3	2	43	18	10.40
4	3	10	4	2	50	17	9.83
5	4	13	5	3	69	19	10.98
6	2	7	3	1	30	17	9.83
7	3	11	3	3	42	17	9.83
8	3	14	4	2	46	15	8.67
9	2	13	3	1	34	15	8.67
10	3	12	4	3	48	17	9.83
Total	30	119	36	22	452	173	100

Source: Authors' field work, 2016.

Figure 1 – Structural Model



Also, the R² values in Table 4 for Hospital Performance and Competitive Advantage were moderate, while Patient Satisfaction was weak. This, in other words, means that 59.5% of the model variance is explained by Hospital performance, 57.4% explained by Competitive advantage and 39.6% explained by Patient satisfaction. The indicator loadings, as shown in

Table 5, are higher than the cross loadings, which means that discriminant validity has been achieved.

Table 4 – Overview Results of the Structural Model

	AVE	Composite Reliability	R Square	Cronbach’s Alpha
CA	0.3201	0.6313	0.5741	0.3559
HPERF	0.3384	0.7044	0.5947	0.5696
PS	0.2479	0.7007	0.3959	0.5493
SCM	0.368	0.7307	0	0.5479

Source: Authors’ Fieldwork, 2016.

Table 5 – Cross Loadings for Structural Equation Model

	CA	HPERF	PS	SCM
CA_1	0.6823	0.4343	0.335	0.6569
CA_2	0.2908	0.3441	0.3534	-0.1091
CA_3	0.712	0.4971	0.4718	0.5526
CA_4	0.4728	0.4404	0.6624	0.2162
HPERF_1	0.7053	0.8044	0.5442	0.6739
HPERF_3	0.1266	0.353	0.0815	0.103
HPERF_4	0.4289	0.6401	0.4941	0.4448
HPERF_6	0.3229	0.4865	0.2069	0.0482
HPERF_7	0.2523	0.5235	0.3914	0.2808
PS_1	0.1689	0.3486	0.2345	-0.0621
PS_2	0.5687	0.2892	0.4654	0.3629
PS_3	0.3446	0.4361	0.7056	0.2385
PS_4	0.2116	0.2287	0.4352	0.3272
PS_5	0.5429	0.5175	0.6678	0.5675
PS_6	0.3694	0.1716	0.3427	0.1994
PS_7	0.3485	0.4147	0.616	0.332
PS_8	0.2449	0.0937	0.2857	0.2301
SCM_1	0.427	0.5143	0.4457	0.5854
SCM_2	0.3872	0.4624	0.3706	0.5549
SCM_3	0.5616	0.4346	0.3747	0.7855
SCM_4	0.1896	0.0962	0.2293	0.3141
SCM_5	0.6131	0.3982	0.4444	0.6883

Source: Authors’ fieldwork, 2016.

In using bootstrapping to assess the path coefficients’ significance, three manifest variables were deleted because their coefficients are less than 2 and, hence, these items are considered not load properly. The manifest variables are: CA_5 (the hospital is capable of offering patients new medical services faster than major competitors), HPERF_2 (the hospital is having increase in its return on investment) and HPERF_5 (there is growth in the hospital’s return on

investment). In using PLS, discriminant validity can be established if the measurement items load on their corresponding latent variables, a magnitude higher than they load on other latent variables and the square root of Average Variance Explained (AVE) is greater than the correlations between latent variables (Gefen & Straub,2005; Gabisch & Gwebu,2011). In this study, the square root of the AVE for each latent variable was higher than the correlations of the latent variables, and this is shown in Table 6.

Table 6 – Latent Variable Correlation Matrix

	CA	HPERF	PS	SCM
CA	0.6092			
HPERF	0.4114	0.5522		
PS	0.3793	0.551	0.5721	
SCM	0.3031	0.5085	0.5967	0.6041

Source: Computation from Smart PLS, 2016.

The minimum number of bootstrap samples of 5000 and 173 original samples was used as suggested by Hair, Ringle & Sarstedt (2011). The results of the test, as shown in Path Analysis, are presented in Table 7:

Table 7 – Result of Hypotheses Test

Hypothesized path	t-statistics	p-value	Result
CA -> HPERF	2.2908	0.023188	Supported
PS -> HPERF	3.1258	0.002082	Supported
SCM -> CA	18.1181	9.95E-42	Supported
SCM -> HPERF	1.6199	0.107086	Not Supported
SCM -> PS	12.0716	1.07E-24	Not Supported

Source: Computation from Smart PLS, 2016.

The result of the hypothesis 1(H₁) revealed that SCM has a strong direct impact on Patient satisfaction and, hence, the null hypothesis, which states that it has a weak impact on Patient Satisfaction, is not supported. The P-value equals to 0.0000, which is less than 0.05 significant level. This result is in agreement with that of Shou (2013), which established that the key measure of health care SCM is Patient satisfaction. There may be failure in SCM as a result of suppliers' inability to meet up with the drug orders from the hospital, delays by hospital in making the order, failure to pay for drug supplied and unexpected disease outbreak where there is no drug for its cure, for example, as was the case with Ebola disease. Other reasons adduced for failure in SCM in health care include: poor inventory management, unavailability of the drug in the market and expiry of drug in excess of hospital requirement (Kanyoma & Khomba, 2013). The lack of efficient SCM in hospitals may result in death of patients, deterioration in patients' medical condition, patients' prolonged stay in the hospital, overcrowding in hospital and transfer of patients to other health facilities where they can get the necessary medication (Kanyoma & Khomba, 2013).

The second hypothesis (H₂), which states that SCM has a strong direct impact on Hospital Competitive Advantage, is supported at the 5% level of significance, with P=0.0000. According to Li et al. (2006), the implementation of various SCM practices may provide the organization a competitive advantage on cost, quality, dependability, flexibility, and time-to-market dimension. Therefore, an efficient SCM has strong impact on hospitals' competitive advantage.

Hypothesis 3 (H₃) is not supported at the 5% significance level, the p value equals to 0.1071. The hypothesis states that SCM has a strong and direct impact on hospital performance. The result indicated that SCM has no strong and direct impact on Hospital performance. In other words, the result revealed that an efficient SCM does not necessarily translate to better performance. Other factors need to be taken into consideration for SCM to be able to have direct impact on hospital performance; for example, there may be the need for patient satisfaction and the hospital achieving competitive advantage over its competitors. Organization performance is measured in terms of both financial and non-financial metrics, so the hospital should use its competitive advantage to influence its performance. In a similar work done by Li et al. (to – Check the date), they asserted that SCM practices can have a direct, positive influence on organizational performance as well as an indirect one through competitive advantage.

The fourth hypothesis (H₄) states that Patient Satisfaction has a strong direct impact on Hospital Performance. The result of this hypothesis is supported by $P = 0.0002$ at 5% significant level. This result indicates that patient satisfaction would lead to better performance. A study has confirmed that, in hospitals, quality management initiatives have been raised on how quality care can be delivered in order to influence outcomes with respect to hospital performance and patient satisfaction (Jiang, Friedman & Begun, 2006).

The result of hypothesis 5 (H₅) is supported at the 5% significant level with p value = 0.0232. The null hypothesis, which states that Competitive Advantage has a strong direct impact on Hospital performance, is, therefore, accepted. Li et al.'s (2013) study, which states that higher levels of competitive advantage may lead to improved organizational performance, supports this result. Hospitals which have a competitive advantage in terms of service delivery, patient care, good physical environment, better pricing strategy and customer relations will, in no doubt, achieve better performance.

This may be in terms of increase in number of patients, increase in profits and gaining good market share in the health care industry. A greater proportion of Medical Directors of the Private Hospital considered for the study agreed that efficient SCM decisions have brought about improved financial performance to their hospitals.

5. Conclusion and Recommendations

This study has examined how SCM influences the quality of patient care delivery in private hospitals in Ilorin, Nigeria. It employed the Structural Equation Model-Partial Least Square method to test the hypotheses raised, and it has been found that SCM has a strong direct influence on Patient Satisfaction and Competitive Advantage. Also, SCM has no strong and direct impact on Hospital performance, but has indirect impact on performance through Competitive Advantage. The study found that Patient Satisfaction has a strong direct impact on hospital performance. It is no doubt that an efficient SCM will result in more Patient Satisfaction and better Competitive advantage for not only private, but other types of hospitals, which will consequently result in better performance. The following recommendations are made to ensure that better hospitals' performance is achieved: Private Hospitals should process orders from suppliers who are closer to them. The procurement function could also be outsourced to Suppliers that are jointly owned by Private hospitals. This would result in improved product pricing and reduced inventory. Private hospitals should not depend on a single supplier; they should try to have more dependable suppliers. In a situation where there is the unavailability of drugs in the market, efforts should be made to get close substitutes for the drugs.

Also, where there is sudden outbreak of diseases and no drugs, such as the case of Ebola, proactive measures should be taken to ensure that the spread of such disease is prevented, pending the time that there will be a cure for the disease. Professionals and graduates having

skills in SCM should be employed for good decision making to be achieved in hospitals, in terms of Procurement and Supply Chain practices. The major limitation to the study is that the sample size is not large enough to properly accommodate the heterogeneous population under study.

However, it is suggested that larger sample size should be considered for future study. This study has been able to take care of the problem by the use of PLS - SEM Model. The model is generally recognised as achieving a high level of statistical power with small samples.

Appendix

QUESTIONNAIRE

1. Name of hospital _____
2. Year established _____
3. Number of hospital beds _____
4. Number of Doctors _____
5. Number of Nurses _____
6. Number of suppliers/vendors _____
7. Do you have Procurement of staff [a]Yes [b]No
8. Who are those involved in the procurement for the hospital?
[a] Nurses and other admin staff [b] medical directional [c]Nurses only
[d] Administrative staff only

Section A: Information about the Hospital

9. How do you rate the suppliers' efficiency?
[a] very effective [b] effective [c] undecided [d] not effective [e] strongly not Effective
10. Do you think supply claim management has an effect on your hospital performance? [a] Yes [b]No
11. If yes, how effective is it?
[a] very effective [b] effective [c] undecided [d] not effective [e] strongly not effective
12. Is there improvement in your hospital financial performance as a result of the supply chain management decision put in place? [a] Yes [b]No
13. How do you rate your hospital financial performance
[a] Excellent [b] Good [c] Fair [d] Average [e] Poor

Section B: Measurement Instrument for the Patient Care Delivery and Supply Chain Management.

Latent Variables	Manifest Variables
Supply Chain Management (SCM)	<ul style="list-style-type: none"> (a) The supplier relationship with the hospital is dependable (b) The suppliers are meeting with the standard specifications set by the hospital (c) The suppliers are able to meet up with their delivery dates. (d) The hospital enjoys follow up maintenance service with the suppliers after sale (e) There is an appropriateness of medical equipment and supplies to the specification agreed upon between the suppliers and the Hospital.
Patient Satisfaction (PS)	<ul style="list-style-type: none"> (a) The Hospital services are effective and efficient (b) The Hospital Staff and Patients have good interpersonal relations (c) The hospital Staff members are technically competent in performing their task and the facilities provided by the Hospital are able to meet up with patients' expectation (d) There is unrestricted access to the Hospital's services (e) The hospital maintains a good level of trust and confidentiality with patient and risk of injury, infections and other harmful side effects are minimal (f) The Hospital provides consistent and constant care to the patient which enables them maintain continuous visit for treatment (g) The hospital offers to the patients' good facility, comfort and clean environment (h) The hospital offers their patients appropriate choice treatment
Competitive Advantage (CA)	<ul style="list-style-type: none"> (a) The hospital offers patients lower medical charges than its competitors (b) The Hospital services to the patient are reliable and of good quality (c) the hospital offers timely care to Patients (d) The hospital makes its services to meet up with the patients' needs. (e) The hospital is capable of offering patients new medical services faster than major competitors
Hospital Performance (HPERF)	<ul style="list-style-type: none"> (a) The Hospital records good market share in the Healthcare Industry (b) The hospital is having increased in its return on investment (c) The Hospital has been witnessing the growth in its market share (d) There is an increase in the hospital's number of patients (e) There is growth in the hospital's return on investment (f) There is an increase in the hospital's profit margin (g) The hospital has been enjoying a good overall competitive position

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