

Management of Healthcare Supply Chain: An Overview

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Abstract:

Health care industry in developing countries has been considered as one of the most revenue generating sector. The industry has a high social impact and deals with the human life. The study of supply chain management by previous researchers was done in manufacturing and in fast moving consumer goods. The health industry remained untouched and less attention has been given in health care sector supply chain. The present paper focuses on the understanding the various aspects of supply chain management applicable to the health sector. The study in the paper reveals how the advancement of new technology, improper coordination and cooperation between the major players make the management of supply chain difficult. The paper discusses the involvement of many stakeholders and their conflicting objectives are enhancing the complexity of the health care supply chain. The study in the paper helps in understanding the concept of supply chain management related to health care industry.

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1. INTRODUCTION

In India, the healthcare industry is one of the largest service industries in terms of revenue generation. Health care industries in developing countries are trying to develop a strategy that will improve the operational efficiency and reduction in cost without affecting the services provided to customers. Approximately 4.2 percent of total GDP has been spent on the health care sector in India. It also has a high value of social impact as it employs more people as compared to other service industry. Various actors of health care sectors are patients, hospitals, vendors, physician, nursing staff and pharmaceutical organizations. The health care sector has a great importance as it deals with the human life and welfare. Likewise the manufacturing sector the prime objective of health care sector is also to provide the customer satisfaction at minimum cost.

Supply chain management is a process in which goods, services, information and fund flows simultaneously among the different chain members. It is a set of decisions and activities which ensures the availability of the right quantity of materials/products/services at the right place, at right time at minimum cost and as per the customer's expectation. It considers all the factors that influence on the overall supply chain management. It significantly improves the cost and added the value of the product or services while effective utilization of capital resources. Organizations are trying to integrate all the processes along the supply chain in order to get competitive. Supply chain management consists of all the processes that are involved for customer delight.

Health care supply chain management is the management and improvement of the system that provide the health care services. Health care supply

chain management can be defined as the set all activities that are required to provide the medical goods and services (like medicine, surgical equipment, clinical equipment, syringes etc.) from manufacturers to the customer. The benefits of effective and efficient supply chain management in the health care sector is to improve the quality of care, improve response time, enhancement of productivity, better utilization of resources, consistent patient staffing.

The health care organization has still not derive fruitful results of best Supply chain management practices because of very slow rate of adoption therefore it is generally known as highly fragmented and inefficient industry as compared the manufacturing industry [1]. Different supply chain members work independently focus only on their internal processes and hence involved in price hiking they have a lack of coordination between the other departments/members of the supply chain [2]. Different programs are generally addressed in hospital to decrease the resource utilization and enhancement of the quality of care of patients, but these programs will not give better results for a long time. Internal hospital Supply Chain is the weakest link in the Supply Chain integration [3]. Different medical workers are usually concerned with the internal logistics performance, frequently to reduce the time of patient care [4]. Because of the advancement of technologies, involvement of multiple stakeholders and a dynamic and vibrant environment and complex nature of health care sector enhance the difficulty of adopting the best the practices of supply chain in hospitals. Patient care and cost reduction can be achieved by proper selection of purchasing activities, inventory management techniques and distribution activities [5].

In spite of the impact of health sector and its growing contribution to the economy, there is very less attention is given to the application of supply chain management in the healthcare industry, as it is considered as the most fragmented and complex nature. Therefore, a framework of the health care supply chain management has been introduced in this study by understanding the principles of supply chain management related to health care industry. The purpose of this research is to understand the different enablers and inhibitors of Health care supply chain management that will assist the decision makers to improve the best practices in their hospital which will ultimately benefit the patients.

2. MATERIALS AND METHODS

2.1 LITERATURE REVIEW

Healthcare supply chain management is still a main point of research as it directly involves the human life. Most of the researches focus on external supply chain integration as compared to the internal supply chain management [3]. They tried for better management of inventory while applying Vendors management techniques, faster response time and electronic management of data. The hospital supply chain can better manage by proper planning and coordination and management of materials [6]. By accurate forecasting, proper management of inventory, timely delivery of materials and by proper and accurate information sharing can widely improve the internal integration and hospital supply chain management. Some of the authors state the importance of inventory management of internal integration [7]. The central purchasing policy is effective for efficient materials management [8]. It emphasizes the critical role of information system for internal integration. An information system is a problem for hospitals as it leads to duplication of data, under utilization of flow of resources if not used properly while other researchers mention that if it is managed properly results well planned and managed inventory and data integrity [10], [11]. The use of the internet for purchasing purpose significantly reduce the cost [12]. The use of barcodes techniques or RFID implementation techniques for inventory visibility [4]. The use of horizontal cooperation between neighbours, hospitals to for better supply chain integration [13].

Literature survey shows that all the researches mentioned above focuses only one or two specific areas which will not suffice to obtain the customer satisfaction Therefore, it can be concluded that there is still a need of understanding the supply chain management perceptions of health care industry. This paper is an effort to serve this purpose.

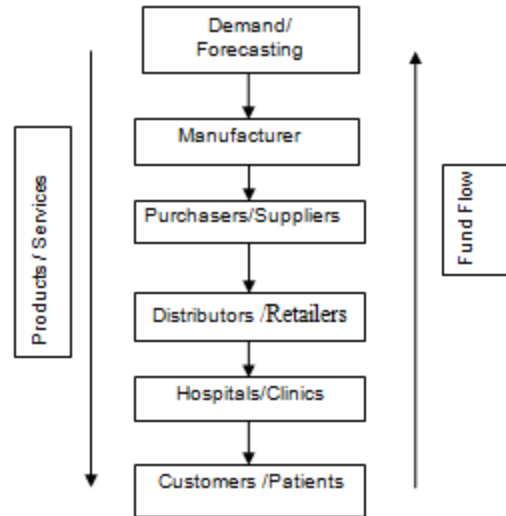
2.2. CONCEPT OF SUPPLY CHAIN MANAGEMENT RELATED TO HEALTH CARE SECTOR:

Now a day's health care industry is trying to develop some important innovations to improve its operational efficiencies and reduction in cost without compromising the quality of patient care. Such innovations like vendor managed inventory system considerably reduce the cost and increase the customer response at the same time. The objectives of the Healthcare sector can only accomplish if the

concepts of supply chain management can be effectively and efficiently applied.

The concept of supply chain management in the health care industry can better understand by following diagram:

Figure1. Model of Health Care Supply Chain Management



Supply chain in the health care industry has been significantly different from the manufacturing industry because of customization of services provided, participation of customer/stake holder and uncertainty about the basic processes. Therefore, it is very difficult to forecast a particular product/medicines/equipment in a health sector for a specific period of time. In health sector hospital is the main entity which provides the care of the customer in terms of diagnosis and treatment.

The healthcare industry is one of the highly complex and fragmented and independently operated service industry and hence the different stakeholder have their conflicting goals [14]. For example, within the

health care sector, the physician demands those items which provide the best level of quality of care without considering the cost while the top management have interest in providing the same quality of care but at the minimum cost. At the same the pharmaceuticals, distributors and retailers wants to provide the same generic products/medicines/instruments to increase their profit margin.

Success of health care supply chain management can be measured in terms of customer's / patient satisfaction, profit earned by the stakeholder, efficiency of internal operations, improvement of the customer / supplier relationship and efficient utilization of resources.

Table1: Health Care Supply Chain Management

S.N.	Concept	Meaning	Barriers/Challenges
1	Demand Management	Right quantity of medicines / clinical or surgical instruments.	Conflicting goals between departments and stakeholders.
2	Inventory Management	The minimum level of inventory should always be maintained to meet the customer's demand as its shortage can affect the human life.	Improper information flow.
3	Capacity and Resources management	Staff, beds diagnosis centers.	Trained Staff.
4	Customer Relationship Management	To improve customer faith and loyalty.	Lack of proper policy and establish information flow.

5	Supplier Relationship Management	By providing the faster and timely services.	Improper coordination.
6	Complex and Fragmented nature of health care operations	Due to the involvement of many stakeholders.	Due to conflicting goals of stakeholder.

2.3. VARIOUS ISSUES OF HEALTH CARE SUPPLY CHAIN MANAGEMENT:

Following are the major issues which affect the management of supply chain in the health sector:

2.3.1 Advancement of New Technology

Jayaraman et al. (2014) have an opinion that due to rapid change of technology advancement in the generation of new product with the same composition and new and better method of diagnosis and treatment also increases the SCM practices in the hospital as the members does not have good practices of procurement, inventory management system [15]. Also, it increases the new way of delivery and distribution of medicines.

2.3.2 Communication (lack of information flow)

Breen and Crawford, 2005; Harland and Caldwell, (2007) mention that Information sharing and the use of e-business is directly correlated to the co-ordination and combination of operational processes like procurement, inventory visibility, etc. [16]. Therefore a lot of research focuses to find the role e – services in hospital supply chain management.

2.3.3 Cooperation

Ineffective cooperation among the supply chain partner in the health care sector leads to the increase the waiting time, duplication of work /test of the patient, unnecessary delay in the medical/equipment supply [17].

2.3.4 Coordination (Integration issue)

The objective of increasing the patient care at minimum cost is generally depends how well the different processes are integrated. The basic approach to achieve the high performance of SCM can be achieved by integrating the operational processes in hospital [18].

2.3.5 Non Availability of Essential Medicines, Modern Equipments:

Non availability of materials like medicines, surgical or clinical equipment is also a problem while implementing the SCM practices in the health sector [19].

2.3.6 Shortfall of Trained Human Resource

The other issues are the lack of motivation, interest and knowledge of SCM principle increases the complexity while implementing the SCM practices [20].

3. RESULTS AND DISCUSSION

A large number of findings has been emerging as a result of this study. This study shows the various aspects of supply chain management related to health care sector. First of all the this study shows the meaning of various supply chain management terms applicable to the healthcare sector. These terms have a special meaning when applied to healthcare sector like demand management; represent the exact requirement of medicines, surgical and clinical equipments. Similarly Inventory management has been playing a vital role in health care supply chain management. If inventory is mismatched it can cause the loss of human life. Poor inventory management in the health care sector can also increase the cost of patient care [21].

Capacity management in the health care sector can be done very accurately and precisely as it manages the working staff and bed management in hospitals. It also manages the machines of various testing equipments. Trained staff is required while assessing the capacity and resources management. Another important aspect of healthcare supply chain management is the customer relationship management and supplier relationship management [22]. The customer relationship management can be made stronger by making the proper top management policy related to patient care and adequate information flow. Supplier relationship management can be better managed by proper coordination among different actors of healthcare supply chain management [23].

The second important finding of this study is that it represents the different challenges which has been observed by the health care supply chain management. Different actors of healthcare supply chain management have generally acted in a more disjointed manner and provide deferred response to the requests of the other members [24]. The actions

of all the members in the SCM are more personal profit centred to a certain extent than the exact requirement of supply chain profit-oriented. Supply chain management involves the different actors like Physician/Doctor, Staff members, Nurses, Top management, patients. Different actors have their individual objectives which are collaboratively conflict among others. This causes a significant problem to adopt the best practices of healthcare supply chain management. Example, the patient wants the high quality care at the minimum cost while the owner wants the high profitability of the hospital which required the higher cost. Also, as in healthcare supply chain management more than one member is involved, therefore none of them generally take the responsibility as a result some time stock out occurs or some time huge inventory is piling up [25]. Often there is a disintegration of responsibility and supremacy between the ministry of health, the hospital, and health staff at the district level which will reduce the practices of SCM. Another problem observed in healthcare supply chain management is the lack of information flow among the different member of the supply chain. Lack of communication can results huge pile up of inventory or sometime the shortage of important drugs or the equipment. That is an undesirable situation as it will certainly increase the operational cost of effective patient care.

4. CONCLUSION

Now a day's all the organizations (may be manufactured or service industry), trying to adopt new technologies or restructuring their whole system to adopt the various techniques of supply chain management. Because of the advancement of new technologies, changes in customer's preferences, health care industries also change their processes to remain competitive in the market. Health care industry is more complex and fragmented industry due to the involvement of many stakeholders like customers' preferences, manufactures preferences as well as supplier choices. Thus the requirement of adoption of the principles of supply chain management is increasingly significant. The effective adoption of supply chain principles requires the effort from all the stakeholders from top to bottom. It also required proper coordination and cooperation both from supplier and customers in order to gain competitive advantages. Basic principles of supply chain management as related to health care industry have been proposed in this study. Different activities which are generally used in the supply chain management of the manufacturing sector have been

described in perspective of health care industry. By doing so the managers of health care industry will be more aware about the supply chain strategies.

From the literature review it has been observed that the researchers are now becoming more aware about the SCM principles and tries to improve the processes, but still there are many inhibitors that are needed to by conquer. Researchers in this field did not focus on overall supply chain management till now. For example, some of them focuses on logistics problem or some on inventory management. But in order to get the full advantage they must have to consider all areas at a time. Therefore, it is necessary to understand firstly the basic concept of supply chain management principles only then improvement can be made. It can be concluded that still there is a requirement of more efficient and customer oriented supply chain in the health sector to serve the human in better ways. management and inventory management. Only after resolving all this problem of supply chain, health care sector will provide the fruitful results.

5. FUTURE SCOPE

In future, the weight of patient service level can be increased by applying the various multi criteria decision making (MCDM) techniques like analytical hierarchy process. This will help the healthcare supply chain manager to understand which criteria plays an critical role for providing patient services. Another MCDM technique such as TOPSIS (techniques for order preference by similarity to ideal solution) can also be implemented to determine the ideal solution in various dimensions of healthcare supply chain management like inventory , distribution etc. Interpretive structure modelling (ISM) can also be implemented after identify the barriers and enablers of healthcare supply chain management.

Conflict of Interest: Author would like to declare that this is my original work and has not been submitted anywhere else.

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