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The Indian Pharmaceutical Industry's Supply Chain Management Strategies

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This is to certify that the doctoral study by

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has been found to be complete and satisfactory in all respects,
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2016

Abstract

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by

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MS, University of New Haven, 2005

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Doctoral Study Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Business Administration

Walden University

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Abstract

Indian pharmaceutical companies spend one-third of their revenue from supply chain management (SCM) activities due to inherently poor transportation infrastructure. SCM is a vital function for many companies, as it is usually employed to lower expenses and increase sales for the company. SCM costs are higher in India than they are in other areas of the world, amounting to 13% of India's GDP. The purpose of this study was to explore SCM strategies Indian business leaders in the pharmaceutical industry have used to reduce the high costs associated with SCM. This study used a single case study research design and semistructured interviews to collect data from 3 SCM business leaders working in Indian pharmaceutical organizations and possessing successful experience in using SCM strategies to reduce high costs. Goldratt's (1990) theory of constraints was used as the conceptual framework for this study to identify challenges associated with SCM strategies. Data from semistructured interviews, observations, and company documents were processed and analyzed using data source triangulation, grouping the raw data into key themes. The following 3 themes emerged: distribution and logistics challenges, impact of SCM processes, and best practices and solutions. The implications for positive social change include the potential to reduce supply chain risk, which could lead to lower product prices for consumers, increased stakeholder satisfaction, and a higher standard of living.

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Dedication

I am dedicating this study to my wife and children who have been of immense help and support, tolerating my times away during the weekends and through the nights, which it does not go unnoticed. Thank you all for your support.

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I want to express my sincerest appreciation to Dr. Jorge Gaytan, my study chair, (I see him as a mentor) for keeping me focused, providing valuable guidance, and supporting me throughout the process. Thank you also to Dr. Stephanie Hoon for serving on my committee and for the encouragement. I would also like to thank Dr. Roger Mayer for serving as the University Research Reviewer. Thank you.

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Section 1: Foundation of the Study

The pharmaceutical supply chains in developing and developed countries vary interms of their organization, financing, function, and ideal characteristics of the best performing supply chains (Choi, Narasimhan, & Kim, 2012). Supply chain management (SCM) in the pharmaceutical industry can transform the organization to make better use of assets and resources, to generate profits, to enhance shareholder value, and and to positively respond to customer demand. Lack of effective SCM can cause problems for organizations (Wisner, Tan, & Leong, 2015). The focus of this qualitative study is to determine the best practices and successful SCM strategies that Indian business leaders in the healthcare industry can use to reduce the costs associated with SCM.

Background of the Problem

The supply chain is the network created among different companies that produce, handle, and distribute a specific product (Susarla & Karimi, 2012); in the current study, the product being investigated is pharmaceutical medicine. The supply chain is essential to getting medicine to market and generating revenue from the process. However, we keep in third person do not understand the difficulties and challenges associated with this supply chain in places such as India. There was a knowledge gap about effective SCM in third world countries with a high incidence of medical need. In a global marketplace, managing the supply chain was a significant challenge, because of continually changing demands of shorter product lifecycles, industry consolidations, variable conditions on the ground (Assey, 2012).

SCM is vital for companies, as a successful SCM strategy can lower expenses and increase sales for the company. SCM practices enable the world's leading organizations to realign their supply chain to the distinct set of concepts by providing functioning solutions for enterprise needs in supply and demand planning and forecasting, sourcing and procurement, and supply chain execution (Susarla & Karimi, 2012). The connections and nodes in a supply chain achieve functions that contribute to the value of the goods transported through the chain (Assey, 2012). Any connection that does not work well reduces the overall effectiveness of the whole supply chain (Assey, 2012). Effective and efficient supply chain processes are vital to reduce the product cost while maintaining quality and ensure the availability of inventory. To succeed, companies that distribute medicine must practice effective SCM to ensure their competitiveness in the market.

Problem Statement

Indian pharmaceutical companies spend one-third of their revenue from SCM activities due to inherently poor transportation infrastructure (PCGI, 2013; Tyagi & Agarwal, 2014). SCM costs are higher in India than in other areas of the world, amounting to 13% of India's GDP (Adhikary & Bora, 2014). The general business problem is that some Indian healthcare business organizations are spending a large amount of money on SCM issues. The specific business problem is that some Indian business leaders in the healthcare industry lack knowledge of strategies to reduce the high costs associated with SCM.

Purpose Statement

The purpose of this qualitative study was to explore the SCM strategies that Indian business leaders in the healthcare industry have used to reduce the high costs associated with SCM. I used a case study research design approach to explore the SCM related problems in the distribution of pharmaceutical drugs in India. The sample population consisted of three business leaders working in Indian healthcare organizations that are successful in using SCM strategies to reduce the high costs. This population is important because they are the key stakeholders who manage the SCM strategies. The research design included the following data sources: (a) semistructured interviews, (b) company documentation, and (c) observations. The social impact of this study was that its results may enable leaders of healthcare business organizations to identify and implement best practices in SCM processes, reduce operating costs, improve profitability, and facilitate increased availability and distributions of medicines to patients.

Nature of the Study

Yin (2014) identified three methods of research: quantitative, qualitative, and mixed methods. A quantitative method is used to determine the relationship between variables through hypothesis testing and generalizability of results (Bhattacherjee, 2012). Qualitative research is a form of research in which the researcher collects and interprets the data, making the researcher as much a part of the research process as the participants and the data they provide (Corbin & Strauss, 2014). The mixed-methods research methodology combines qualitative and quantitative research methods (Yin, 2014).

Qualitative research methodology develops an understanding of participants' views and experiences (Montero-Marín, Carrasco, Roca, Serrano-Blanco, Gili, Mayoral, & García-Campayo, 2013). For this reason, I selected the qualitative research design method to identify distribution practices and transportation challenges that are contributing to the healthcare companies' operational costs and accessibility at regional centers in India. The quantitative method was not selected because my goal is not to test hypotheses or the relationship of variables (Bishop & Lexchin, 2013). The phenomenological research design approach is suitable for exploring the perceptions, opinions, and feelings of participants based on their lived experiences with a particular phenomenon (Moustakas, 1994). For this reason, I did not select a phenomenological research approach.

The qualitative content analysis research approach is a research method for subjective interpretation of the content of text data through the systematic classification process of coding and identifying themes or patterns (Ji Young & Eun-Hee, 2014). As a result, the content analysis research design approach was not suitable for my study. The ethnography research design approach is a research approach used to investigate unfamiliar cultures through close observation, reading, and interpretation (Hohmann & Shear, 2014) and, consequently, it was not suitable for my study. The narrative analysis research design focuses on the way in which people make and use stories to interpret the problem. In addition, it focuses more on human knowledge views than collection and

processing of data (Robert & Shenhav, 2014). For these reasons, I did not select a narrative research design approach for my study.

In this study, I used a qualitative case study research approach to collect data through semistructured telephone interviews via Skype with the SCM business leaders. According to Yin (2014), the case study research design approach relies on the paradigm of focusing on a bounded system to explore and explain knowledge and subjectivity of respondents' experiences while highlighting commonalities and differences.

Research Question

The general business problem was that Indian healthcare organizations are spending a significant amount of their budgets on SCM related factors. The specific business problem is that several Indian business leaders in the healthcare industry lack knowledge of strategies that could be used to reduce the high costs associated with SCM. The overarching research question in this study was as follows:

RQ1: What SCM strategies can Indian business leaders in the healthcare industry use to reduce the high costs associated with SCM?

To provide conclusions, I documented the interviews of the three business leaders in India who were successful in implementing best practices and SCM knowledge.

Interview Questions

I used semistructured interviews to explore supply chain distribution practices and processes. I used semistructured interview questions allowed for open-ended responses

while ensuring that interview sessions are guided to address the research questions of this study (Marshall & Rossman, 2011). The interview questions included the following:

1. What is the process of medicine distribution in India?
2. What are the factors that contribute to the challenges of distributing medicine in India?
3. What are logistic challenges encountered in distributing medicines in India?
4. What is the impact of distribution, disruptions, and logistic challenges to the healthcare companies in India?
5. Do you think business leaders are spending considerable money in SCM related factors? Why or why not?
6. How can SCM process reduce the costs of medicine in India?
7. What type of SCM practices are in place for distributing medicines in India?
8. What are the primary logistical challenges faced by medicine distributors in India? Such as long distance travel of the medicines?

Conceptual Framework

Goldratt's (1990) theory of constraints (TOC) was used as the framework for this study. The TOC is a system-based management philosophy that seeks to understand and identify the core causes that limit a system from achieving higher performance relation to its goal (Goldratt, 1990). I used the TOC method to identify challenges asscoiated with SCM strategies and to find solutions. The TOC paradigm states that every single firm must have at least one constraint (Goldratt, 1990). A constraint is defined as an element

or factor that limits the system from doing more of what it was designed to accomplish (Goldratt, Cox & Whitford, 1992). The TOC encourages business managers to identify what is preventing them from achieving their goals and to find solutions to overcome this hindrance.

There are three distinct but interrelated areas in TOC: logistics, performance measurement, and logical thinking (Cox & Spencer, 1997). TOC applications in the logistics category include logistical challenges, scheduling method, and value-added tax (VAT) analysis. Performance measurement determines whether the organization is making money. Development of TOC incorporates solutions for SCM.

Definition of Terms

The unique operational terms used in the study are defined below.

Active pharmaceutical ingredient (API). An API is any component intended to provide the pharmacological activity or another direct effect in the diagnosis, treatment, or prevention of disease (General Definitions' Rule, 1978).

Best practices. Best practices are procedures and practices implemented throughout an organization to increase organizational competitiveness (Seeger, Locker, & Jergen, 2011).

Supply chain management. SCM includes guidelines and best practices that are evolved over time for effective management of the supply chain in order to gain competitive advantage (Christopher & Holweg, 2011).

Theory of supply and demand. An economic model of price determination in a market, the theory concludes that the unit price for a particular good will vary until a point is reached where the quantity demanded by customers equals the quantity supplied by producers (Weeks, 2012).

Assumptions, Limitations, and Delimitations

In this section, the assumptions, limitations, and delimitations of the study are presented.

Assumptions

Assumptions are notions that the researcher believes to be true and accurate (Elo, Kaariainen, Kanste, Polkki, Utriainen, & Kyngas, 2014). The first assumption was that the participants would answer the questions as honestly as possible and that the participants would not drop out of the study. The second assumption was that the participants selected would have the necessary expertise to provide relevant and valid data. The third assumption was that a case study research design approach would be the best design for this qualitative study. Finally, the last assumption was that the information presented in this study would add to the SCM body of knowledge about successful strategies and best practices.

Limitations

Limitations are potential shortcomings of the study that are typically out of researcher's control (Gibbons, 2015). The scope of this study was limited to SCM issues and the availability of medicine in India, although its findings may be applicable to other

markets. The study sample was limited to three business leaders working in India. The results of this qualitative study depend on the participants' abilities to articulate events and for the researcher to document and interpret the information accurately.

The main limitations that affected this study were: the ability to generalize, availability of information, the experience of the participants with taxonomies, and the researcher's training. Yin (2014) noted that researchers require training when conducting the study research. To prepare for conducting this study, I completed several graduate level research design courses, reading numerous peer-reviewed references, and reviewing case study books.

Delimitations

Delimitations are design parameters which are within the control of the researcher, such as the study site location (Marshall & Rossman, 2011). The scope of the study was limited to three business leaders who have been successful in taking advantage of the best practices and SCM knowledge working in India. Using a semistructured interview format allowed me to elicit additional information from the study participants by asking follow-up questions based on interviewees answers.

For the purpose of this study, I focused on preselected interview questions and probed deeper into additional questions as the opportunity presented itself. My goal in conducting this study was to explore and record the participants' experiences and thoughts.

Significance of the Study

The purpose of this qualitative case study was to explore the SCM strategies that Indian business leaders in the healthcare industry have used to reduce the high costs associated with SCM. In this section, the study's contribution to business practice and implication for social change are presented and discussed.

Contribution to Business Practice

This research study was significant because it may enhance organizations' supply chain effectiveness and their reputation for on-time delivery, reducing organizations' operational costs. The purpose of this qualitative study was to explore the SCM strategies that Indian business leaders have used in the healthcare industry to reduce the high costs associated with SCM. Results of this study revealed the strengths and weaknesses of the medicine supply chain in India, which the companies will benefit from because they can maintain their strong points and improve on the weaknesses.

Implications for Social Change

This study may contribute to social change by assisting organizations in the field of medicine in ensuring that essential medicines are available for patients at the time they need them. The results of the study may change how patients view medical organizations that are associated with providing medicines for their treatments.

The results of the study may also provide insights on how to ensure that medicine is available for patients' treatments. Moreover, the results of the study could change the

manner in which patients purchase their medicines because supply chains may be able to ensure the availability of medicines at all times.

A Review of the Professional and Academic Literature

SCM costs are higher in India than in other areas of the world, amounting to 13% of India's GDP (Adhikary & Bora, 2014). The purpose of this qualitative case study was to explore the SCM strategies that Indian business leaders in the healthcare industry have used to reduce the high costs associated with SCM.

The literature review covered the topics of SCM efficiency, distribution and transportation logistics challenges, and demand forecasting methods that could assist improving the SCM activities. The content under research represented the material from recognized supply chain institutions, journals, and professionals include specific trends of problem areas and solution across the industry. Additional literature obtained through searching various journal articles, published books, and other credible publications found online such as Thoreau, different ProQuest Dissertations and Theses, NCBI, Medline Plus, EBSCOhost database, PubMed, Google Scholar, JSTOR, PsycINFO, Questia, Sage, and others.

I have organized this section in several subsections, which are: (a) general analysis of the supply chain distribution processes which will describe the supply chain processes in India, (b) SCM challenges in the distribution of medicine in India which will discuss the interruptions faced by supply chain organizations, (c) challenges in SCM activities due to inherently poor transportation infrastructure and the transportation

infrastructure and its impact on SCM activities, (d) demand forecasting methods that could improve SCM activities in India, and (e) best SCM practices that are in place and how they are used effectively in Indian healthcare companies. A conclusion and a summary of the section followed these discussions.

Regarding the literature review search strategy used in this study, I used various key terms and phrases in online databases and extracted key information relevant to the study. The search for literature commenced with computerized databases such as Thoreau, different ProQuest Dissertations and Theses, NCBI, Medline Plus, EBSCOhost database, PubMed, Google Scholar, JSTOR, PsycINFO, Questia, Sage, and others. The literature retrieval mechanisms contributed to the gathering of an informative collection of studies. It further helped in the conceptualization of a framework that would include relevant information about the medicine supply chain in India.

Search criteria included keywords and phrases, such as a *pharmaceutical industry, pharmaceutical supply chain, medicine supply chain, medicine supply chain in India, importance of efficient supply chain distribution, developed & developing countries supply chain, inventory management, regulatory system, interruptions in procurement, improving medicine demand forecast method, reduce the transportation lead-time of medicine distribution in India,* and *impact of supply chain best practices*.

I referenced a total of 132 references in this study, out of which 124 are peer reviewed, and 92% were published within five years of the expected date of receiving Walden University's Chief Academic Office (CAO) approval for graduation. Regarding

the literature review section, 85% of sources used are peer reviewed and more than 60 peer-reviewed sources were referenced with a frequency of each limited to a maximum of three times.

Theory of Constraints

Goldratt's (1990) TOC was used in this study to frame organizational performance. TOC provided a useful basis for this study because it encourages business managers in the healthcare industry to identify challenges asscoiated with SCM strategies and to find solutions to overcome those challenges. TOC framework is designed to facilitate a systematic analysis within the demands of constraints. There are three distinct but interrelated areas in TOC, including logistics, performance measurement, and logical thinking (Cox & Spencer, 1997). The TOC encourages business managers to identify what is preventing them from achieving their goals and to find solutions to overcome this hindrance. The TOC framework provided a useful basis for this study because it encourages business managers in the healthcare industry to identify solutions to reduce the high costs associated with SCM.

In the TOC, the performance of processes and systems has a direct relation to the performance of its constraint. Goldratt (1990) established that, to improve performance, organizations need to increase productivity while simultaneously reducing both inventory and operational expenses. The incoming revenue is the finished goods, the budget invested in the system is the inventory, and the payments made to make the finished goods are the operational expenses. The variables of measure in the TOC relate to the

finance measures of net profit, return on investment, and flow of cash (Goldratt et al., 1992). Goldratt and Cox (1990) suggested that the following five focus steps are the basis for the business improvement process proposed in TOC:

1. Identify the constraint(s).

2. Decide how to exploit the constraints(s).

3. Subordinate all else to the decision in the Step 2.

4. Elevate the constraint(s).

5. If in any previous steps a constraint is broken or eliminated, go to Step 1.

Improvement of efficiency in business processes is achievable by using the TOC based method. Rhee, Cho, and Bae (2010) developed a TOC-based method to enhance the efficiency of the business process. Rhee et al. (2010) recognized that efficiency is one of the most important performance measures to achieve. Although Rhee et al. (2010) applied the TOC-based method to well-structured processes, concluded that TOC improved processes' efficiency, especially when the workload is significant and resources are scarce (Rhee et al., 2010).

Supply chain collaboration amongst independent firms or business units often provides larger benefits when worked together, as opposed to working in isolation. In addition, a lack of awareness about the existence of constraints on the supply chain prevents the benefits of collaboration from being fully realized (Simatupang, Wright, & Sridharan, 2004). Simatupang et al. (2004) applied the TOC approach to overcome difficulties in realizing the potential benefits of supply chain collaboration and concluded

that the TOC approach can be used to expose an inherent dilemma of collaboration and establish collaborative replenishment policy and collaborative performance metrics to advance supply chain profitability (Simatupang et al., 2004).

Oglethorpe & Heron (2013) applied the TOC method to identify and overcome the operational, supply chain barriers, and constraints that occur in local food supply chains, especially with smaller producers, as they seek to increase market penetration across a wider geographic area. Oglethorpe & Heron (2013) concluded that the TOC approach provided an advancement of knowledge in the area of food supply chain analysis and is conducted in a way that is more practical in use. In addition, Oglethorpe & Heron (2013) recommended seven broad categories to overcome the operational barriers: constraints due to the nature of the market, due to scale and the nature of products; constraints related to employment and skills; institutional constraints; constraints in supply chain relationships; certification, policy, and regulatory constraints; and constraints on personal beliefs and anthropomorphism.

The focus of the TOC theory is to maximize the system's performance (Gupta & Andersen, 2012). Three global measures identified for the TOC theory for evaluating organizational performance toward the goal of the company are finished goods, inventory, and operating expenses (Gupta & Andersen, 2012). These three measures are company-level operational measures of performance and may be used by the company's management to achieve continuous improvement (Gupta & Andersen, 2012).

In addition, Gupta and Andersen (2012) stated that the TOC's primary assumption is that at least one constraint in each system limits the ability of achieving higher levels of performance relative to its goals. Any organization can improve its performance and move toward achieving its goals by improving the weakest operating activity (Rhee et al., 2010). When an organization removes the constraint and moves to a higher level of production or service, a new constraint appears and the cycle of managing the system with respect to the new constraint resumes (Gupta & Andersen, 2012).

SCM is the basis for a firm's competitive advantage because it enables the firm to lower operation costs, increase the service reliability, decrease the inventory level, reduce order cycle time, lower the number of backorders, improve customer satisfaction, and improve overall competitive advantage (Ab Talib & Abdul Hamid, 2014). The focus of this study was to identify and implement best practices in SCM processes that will reduce operating costs, improve profitability, and facilitate increased availability and distributions of medicines to patients in desperate need.

The purpose of this section was to provide a review and analysis of the professional and academic literature relevant to the subject matter. This review will serve as the basis for a framework for data analyses, which includes the coding and classifies them into themes. Coding and categorization allow the researcher to classify, sort and arrange the information in the most efficient, uniform manner (Basurto & Speer, 2012). I used the Krippendorff (2013), content analysis strategy to generate inferences from large

bodies of data that reveal trends, patterns, and differences. The literature review will support the rationale behind the study and the associated interview questions.

Pharmaceutical supply chain. Over the years, the pharmaceutical industry has evolved to address old and emerging diseases using latest knowledge and technology. As the industry has been changing in terms of its indispensable role to address diseases, it has also developed in the dimension of business. In addition, the pharmaceutical companies has gone through a noticeable structural reorganization (Kelle, Woosley, & Schneider, 2012). Some of the essential elements of this organization include drug discovery, delivery mechanisms, launching and marketing, and distribution and production. Trends show that the periods before the 1990s experienced greater stability in the industry (Kelle et al., 2012). Various pharmaceutical companies dominated the industry and had uncontested success for a period of almost a century.

Importance of efficient supply chain distribution. Perhaps the most important consideration in assessing the impact of the pharmaceutical supply chain processes on an organization's operational costs is the simulation and the dynamics involved. Gjerdrum, Papageorgiou, and Shah (2012) developed a standard approach for modeling the dynamics of supply chain and for testing it on different pharmaceutical processes. The model incorporates both the physical and business processes. Pharmaceutical physical processes include manufacturing, distribution and warehousing.

The business processes include decision makers, methods, tools for decision making, and levels of decision making. The model suggested non-invasive ways of

improving the operation of the supply chain (Gjerdrum et al., 2012). The proponents of this model suggested that the improvement of the operation of a supply chain requires making changes in different parameters and business processes.

The pharmaceutical supply chain brings together many agents with different objectives (Ripin et al., 2014). The internal dynamics of these agents can work against organizational performance. For example, if miscommunication among the agents occurs, a negative impact on the result might ensue. This underscores the role of collaboration of the agents in forecasting, inventory management, and planning. Agents must coordinate their activities across the supply chain (Saberi, Nookabadi, & Hejazi, 2012). Larger scale operations, in terms of geographical spans and different activities, account for the current practice that is highly distributed (Saberi et al., 2012).

A collaborative planning activity requires the support of scheduling tools and the multisite planning. The efficiency of a supply chain process depends on the quality of inventory management and coordination (Haq & Boddu, 2015). The cycle time of the overall supply chain distribution processes is critical. Reducing the supply chain cycle time can add to the efficiency of the supply chain that will consequently affect the organization's operational costs. In other words, when companies reduce the time span for a supply chain cycle, making it shorter, the operational costs will be cheaper.

To reduce the total cost of delivering a product to the consumer pharmaceutical organization's are going beyond the walls of their organization and working with suppliers and customers implementing the best SCM practices such as make-to-stock or

make-to-order strategies. The previous research acknowledged that by following the best SCM practices in the distribution firms can reduce the costs associated with the production, transportation, and inventory holding (Ellegood, 2014).

Pharmaceutical organizations have changed from the historical emphasis on supply chain that only involves manufacturing and distribution of goods to the value chain supply chain model that manages the innovation and development processes from capacity to production planning (Wood & Cronley, 2014).

The current focus was to identify innovative ways of exploiting other benefits from the supply chain. Improvements in strategic-making processes accompany these changes to allow for responsive supply chains. The ultimate result of such improvements is an efficient supply chain process that is less capital intensive and, consequently, reduces an organization's operational costs.

Difference between Developed and Developing Countries Supply Chain

The pharmaceutical supply chains in developing and developed countries vary in terms of their organization, financing, function, and ideal characteristics of the best-performing supply chains (Choi, Narasimhan, & Kim, 2012). Other dimensions of differences between supply chains are the use of technology and stock levels. Overall, developed countries have distinct regulatory bodies that regulate the distribution of pharmaceutical products in the market. Medical practitioners from developed countries prescribe but third-party players have a role through reimbursement policies (Cameron, Mantel-Teeuwisse, Leufkens, & Laing, 2012).

On the other hand, developing countries have limited ability to enforce regulations and policies on the distribution of pharmaceuticals in the markets, while the manufacturers do forecast in developed countries with a focus on planning for production, procurers, guided by demand (Cameron et al., 2012).

The pharmaceutical supply chains in developing countries have low and poor visibility compared to those in developed countries. In terms of alignment of incentives and objectives, supply chains in developed countries identify with high-level competition and routine monitoring (Ellram, Tate, & Feitzinger, 2013). On the other hand, supply chains in developing countries are difficult to align, and the absence of performance data hinder the role of incentives. The role and responsibilities of agents involved in the supply chains of developed countries are systematized because they are well trained (Zhu, Sarkis, & Lai, 2012).

Supply chain practices in developing countries are weak; roles are unclear, and there is a high staff turnover compounding difficulties in the supply chains, the responsibilities for many individuals, and the entities losing focus (Zhu et al., 2012). The expiration of medicine in the supply chain is a serious threat to the already constrained access to medicines in developing countries. Privett and Gonsalvez (2014) explained that medicines used for vertical programs, donated, and manufactured by small revenue producers are prone to expiry. In addition, they suggested considering lean supply and stock rotation methods to help in reducing the drug expiry issue.

So far, this paper has established the gaps that exist in the literature as to the inadequacy of studies that deal with SCM. In particular, the existing literature lacks information about organizations' supply chain effectiveness, reputation for on-time delivery, and the overall reduction of organizations' operational costs in India.

Indian pharmaceutical industry. In order to understand the topic of medicine distribution in India, there must be an introduction to the environment of the country pharmaceutical industry. There are several different factors behind the flourishing of India's pharmaceutical industry. Among them, the modification of their laws related to the intellectual property of a medicine, drug registration, and patent protection to positive cost/skill ratios.

The regulatory system. The regulatory system of the Government of India has a federal form that divides the medical regulatory system into national and state authorities. The principal regulatory bodies that are responsible for the approval, production, and marketing of quality drugs in India are the following entities (Saranga & Phani, 2009):

- Central Drug Standards and Control Organization (CDSCO): This agency sets standards to ensure the safety and quality of drugs, diagnostics, cosmetics, devices, and supervision of the importation of drugs.
- National Pharmaceutical Pricing Authority (NPPA): This agency fixes or revises the prices of decontrolled bulk drugs.

- Ministry of Chemicals and Petrochemicals: This organization supervises pharmaceutical sector policy, planning, development, and regulatory activities pertaining to the chemicals, petrochemicals.

Figure 1 shows the drug regulatory system of India (Saranga & Phani, 2009). The national government is at the top. The three ministries that have primary functions in the drug regulatory system of India are the Ministry of Health and Family Welfare, the Ministry of Chemicals and Petrochemicals, and the Ministry of Environment and Forests. The Ministry of Health and Family Welfare and Ministry of Chemicals and Petrochemicals are the two primary entities of pharmaceutical regulation. The Ministry of Health and Family Welfare scrutinizes pharmaceutical issues within the larger context of public health whereas the concentration of the Ministry of Chemicals and Fertilizers focuses on manufacturing policy.

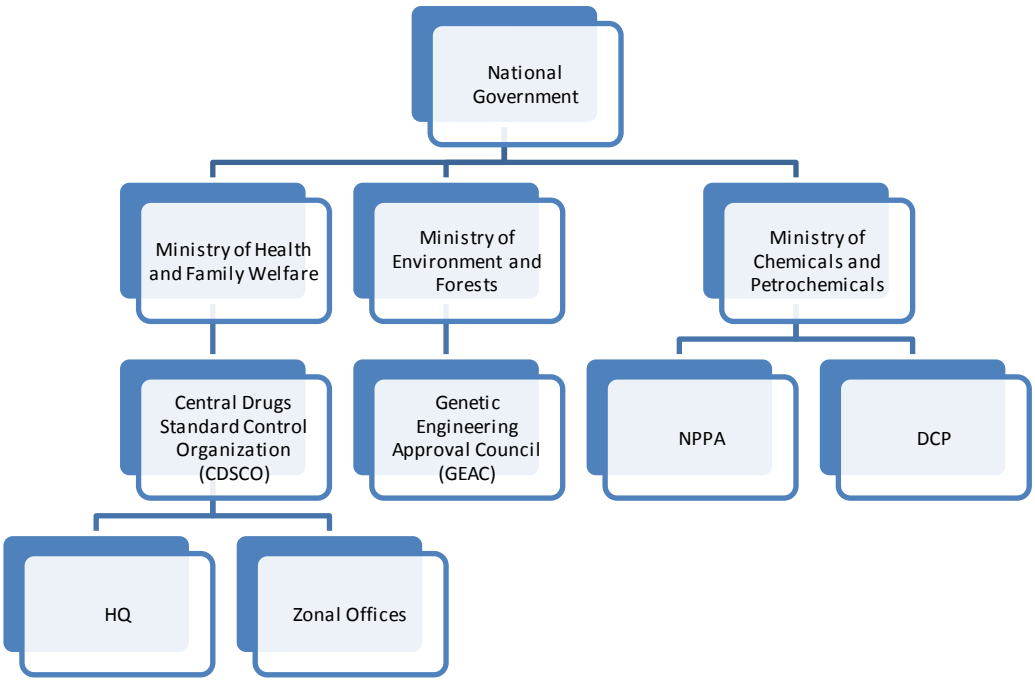

Figure 1. *Drug Regulatory System of India (Rohit, Nilesh, Ravikiran, Pallavi, & Pramod, 2012)*

Existing regulatory mechanisms. In this section, major regulatory policies in India are presented. Different laws of manufacturing, selling, importing, and exporting drugs in India are as follows: The Drugs and Cosmetics Act 1940 (D and C Act); The Pharmacy Act 1948; The Drugs and Magic Remedies (Objectionable Advertisements) Act of 1954; The Narcotic Drugs and Psychotropic Substances Act, 1985; The Medicinal and Toilet Preparations (Excise Duties) Act of 1956, Indian Patent Act of 1970, and The Drugs (Prices Control) Order of 1995 (under the Essential Commodities Act) (Rohit et al., 2012). These acts have implications in the SCM in India. For example, the Essential Commodities Act deals with the availability and affordability of essential medicines or drugs. This act contributes to this study, as it will shed light on SCM in India, especially in making medicines available and affordable.

The Drugs (Prices Control) Order of 1995 is an order issued by the Indian government under the Essential Commodities Act (Rohit et al., 2012). It is an act of price regulation of drugs. It provides a list of controlled drugs, fixation of drug price procedures, the fixed method of implementation of prices by the government, and the penalties for infringement of the Act.

The prices of drugs in India are among the lowest in the world because of several factors (Berndt & Cockburn, 2014). One of which is the fact that Indian labor costs are

low compared to other foreign countries (Berndt & Cockburn, 2014). India also has a large pool of human resource that is competent and is knowledgeable about technical and managerial tasks (Berndt & Cockburn, 2014). Moreover, most of the equipment needed to manufacture drugs is available locally. Most importantly, there are many policies in India about drug price control (Berndt & Cockburn, 2014). Recent policy changes have an impact on the drug prices in India. The National Pharmaceutical Pricing Authority (NPPA) heads the price control regime of the country. The government can exempt certain drugs from price control if these are new drugs discovered in India or if local small-scale industries produced large bulk of drugs, not by multinational companies.

In February of 2002, there was a proposal to change the "method of detaining price controlled drugs" and "pricing formula" of drugs in India (Rohit et al., 2012, p. 51). In 2011, The Department of Pharmaceuticals released a draft note on the National Pharmaceutical Pricing Policy. Figure 2 shows a simple process of the medicine distribution mechanism in India (Rohit et al., 2012).

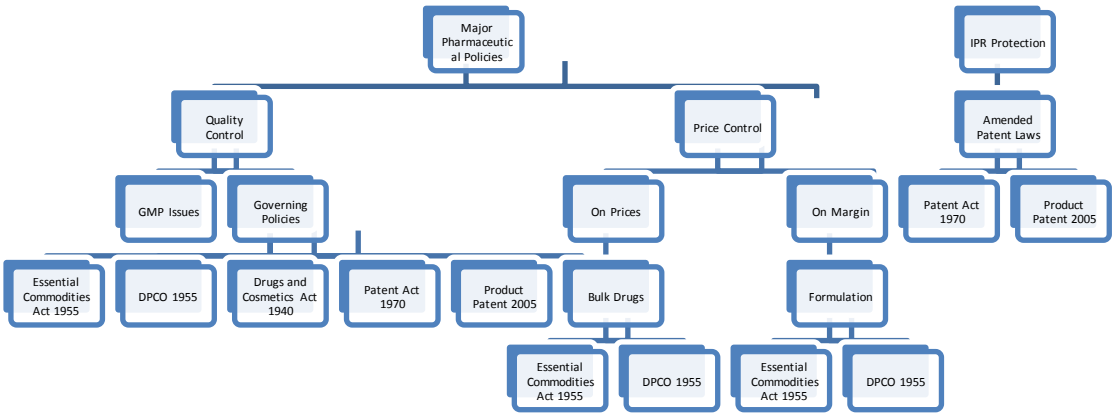

Figure 2. *Regulatory Process of India's Pharmaceutical Industry (Rohit, Nilesh, Ravikiran, Pallavi, & Pramod, 2012)*

Medicine distribution planning. The fast distribution of medical supplies plays a significant role in ensuring an effective and efficient healthcare system. The medical supply distribution is about the movement of a large volume of different items that must be delivered rapidly (Peidro, Mula, Poler, & Lario, 2009). In the United States, most pharmaceuticals follow this supply chain in order to ensure that the delivery of medical supplies on time and with high quality (Guido, Mainetti, & Patrono, 2012). In particular, the medicine supply manufacturers produce numerous medicines as per the demand, and distributors manage huge warehouses and regulate the movement of medicines from manufacturers to the retailers. Retailers are comprised of hospitals, clinics, independent pharmacies, chain pharmacies, and grocery stores.

Differences between Pharma and non-Pharmaceutical Supply Chains

Pharmaceutical supply chains are low on flexibility relative to non-pharmaceutical supply chains. This inflexibility stems from adopting a centralized supply chain approach for pharmaceutical businesses. A centralized approach to supply chains overlooks important activities and processes involved in the chain. For example, pharmaceutical organizations have both, fixed places of production and prices resulting in

difficulties due to issues of distances to markets and lead times of production and procurement. Centralization of the supply chain makes it difficult to respond to competition in certain markets (Wisner, Tan, & Leong, 2015). Most non-pharmaceutical businesses perceive the SCM as a source of strategic strength that can bring many other advantages including cost efficiency.

Most pharmaceutical organizations do not use the end-to-end supply chain model used by most non-pharmaceutical organizations. End-to-end supply chains start with the organizational structure and reflect the markets in which these organizations operate. Procurement is among the very first stages of end-to-end supply chains. Interactions with the vendor and final delivery of goods top patients each have unique steps and that are interdependent. The lack of sufficient emphasis on end-to-end supply chains is what accounts for the slow growth of the pharmaceutical business. This translates into interrupted supply of products to patients that further translates to poor patient satisfaction (Marshall, 2014).

Many researchers have explored ways to improve the pharmaceutical supply chain. Susarla and Karimi (2012) developed a simple yet powerful mixed integer linear programming (MILP) model for multi-period, enterprise-wide planning. The entire enterprise was represented in a seamless fashion with a granularity of individual task campaigns on each production line. The model incorporates procurement, production, and distribution along with the effects of international tax differentials, inventory holding

costs, material shelf-lives, waste treatment / disposal, and other real-life factors on the after-tax profit of the company.

Guido, Mainetti, and Patrono (2012) evaluated the impact of radio frequency identification (RFID) technology, EPCglobal, and ebXML on some business processes that are crucial to the effectiveness and success of the pharmaceutical supply chain. The authors focused on the wholesaler because it is representative of the stress point regarding time and space constraints and product flow. A quantitative and qualitative analysis of a pharmaceutical supply chain was conducted and concluded that the use of RFID, EPCglobal, and ebXML was beneficial to the success of the pharmaceutical supply chain. Staudacher and Bush (2014) examined the way the Lean approach can impact the pharmaceutical supply chain and confirmed that a drug supply chain can benefit from the Lean Approach.

Alsmadi, Almani, and Khan (2014) implemented an integrated activity-based costing (ABC) and TOC approach to enhance decision-making processes of a Lean company. The results revealed that the integration of ABC and TOC provides managers with an accurate, timely, and reliable tool that can help in making decisions about pricing, production line development, process improvements, and product-mix. Sadat, Carter, and Golden (2013) also found that TOC improves system performance through leveraging the constraints.

Nagurney, Li, and Nagurney (2013) presented a pharmaceutical supply chain network model with outsourcing under price and quality competition, in both equilibrium

and dynamic versions. In the study, the authors considered a pharmaceutical company that is engaged in identifying the optimal flows associated with its supply chain network activities in the form of manufacturing and distribution. Moreover, the company seeks to lessen its total costs and considers the role of contractors in the supply chain. The model provides information on optimal pharmaceutical product flows, make-or-buy decisions, and contractor selections. Narayana, Pati, and Vrat (2014) conducted a critical review of the managerial research on the pharmaceutical supply chain. The authors collated recent pharmaceutical supply chain literature, published in peer-reviewed academic journals and found that the research efforts continue to be traditional, as the focus is on efficiency improvement.

However, there is an emerging interest in process analysis and technology implementation in the pharmaceutical supply chain. Moreover, the research on the pharmaceutical supply chain is highly context-specific and focused on developed economies. The design of the distribution system that most considerably affects the rapid distribution of pharmaceuticals directly influence the quality of healthcare provided to the citizens (Mansouri, Gallear, & Askariazad, 2012). The scheme of an effective distribution system includes the careful thought of two strategic planning concerns, which are the place used for the facilities, including warehouses and inventories, in support of the rapid distribution of the medical supplies; and the best strategy that can be used to find the best routes to distribute the medical supplies.

Effective pharmaceutical distribution. According to Susarla and Karimi (2012), a well-managed and well-designed distribution system will have the following features: (a) sustain a constant supply of medicines, (b) maintain medicines in good condition throughout the process, (c) minimize loss due to expiration and damage, (d) maintain correct inventory records, (e) utilize available transportation resources efficiently, (f) provide information to determine forecasting medicine needs, (g) and integrate a quality assurance program. The distribution process begins when the manufacturer ships the medicine and ends when the medicine consumption report is back to the procurement entity (Susarla & Karimi, 2012).

Inventory management influence on medicine availability. In this section, the inventory management influence on quantities of finished goods, location of inventory, and control of incoming and outgoing medicine availability is presented. Kelle, Woosely, and Schneider (2012) examined the often conflicting goals in decision making amongst the various stakeholders in pharmaceutical supply chain and explored the managerial tradeoffs present at the operational, tactical, and strategic levels of decision making. The authors recommended the use of a tactical decision support that concentrates on relevant tradeoffs among three major performance indicators: the expected number of daily refills, the service level, and the storage space utilization. The authors also evaluated the tradeoffs among the refill workload, emergency workload, and formulary. The results indicated that the tactical decision support is a tax that improves the current inventory management of medicines.

Uthayakumar and Priyan (2013) stated that medicine shortages and improper use of pharmaceuticals lead to having a significant negative impact on the patients and to suffering financial losses. As such, they presented an inventory model that incorporates continuous review with production and distribution for a supply chain involving a pharmaceutical company and a hospital supply chain. There are several variables considered in the model such as medicines, variable lead time, permissible payment delays, limits on space availability, and the customer service level. The model they presented developed a procedure through which the user could determine optimal solutions for the inventory lot, size, lead time, and a number of deliveries with minimal cost to the supply chain. Masoumi, Yu, and Nagurney (2012) constructed a generalized network oligopoly model with arc multipliers for pharmaceutical supply chain products using variational inequality theory. The model also encapsulated the economic competition among the manufacturers who seek to determine the maximization of their product, which can also be perishable. The model also takes into consideration the consumers with different product needs and the firms regarding the cost of their products. The authors also found that a pharmaceutical company might lose its dominant market share because of patent rights expiration and generic competition. As such, it must improve its inventory management and logistical management.

Interruptions in procurement. The majority of the drug manufacturers employ make-to-order production process design. That means these manufacturers would not start production until they receive final orders for the medical supplies. Some drug

manufacturers procure the active pharmaceutical ingredient (API) after receiving a purchase order. In the market, there are only a few sources that could supply API for most of the drugs. In this case, there is a delay in the procurement of these drugs because the delivery of the medicine to the country would take several weeks.

Drug manufacturers' state that poor forecasts, as well as small markets, are the reasons for the long lead-time required (Ramanathan, 2012). If the forecasts for the market were uncertain, the drug manufacturer would not keep stocks at hand. If the national programs could provide advance information about the demand for the medicines, there would be reduced lead times. This way, sharing order information would create transparency and increase the efficiency of the process. If there are efficient forecasting methods, the manufacturers could hold a larger inventory of the medicine supplies needed. Inventories should be kept strategically in order to resolve the short- and long-term demand for medicine supplies.

Moreover, procurement delays can arise due to the archaic procurement processes as well as the lack of a sufficient number of suppliers (Panda & Sahu, 2015). An example would be the rules and regulations that often impose purchasers to provide further justification for a competitive market that does not exist.

Distribution setup. The distribution setup is often thin. The logistics of the government's management information system are also weak and not systematic. Government and programs do not know the difference between forecasts and targets. The concept of forecasting involves specifying the coverage targets and then determining the

amount of drugs needed in a specific area. However, determining targets and forecasting of drugs involve comprehensive research. Forecasting methods unsupported by empirical data will fail (Ramanathan & Gunasekaran, 2014). In order to collect data required for the forecasting methods, proper coordination among all the stakeholders involved in the process must take place. Data gathering for medicine purposes must be wisely coordinated to ensure that the forecasting is accurate.

Demand forecast methods. Forecasting is defined as the process of estimating the amount of the selected products the program will need to reach the population to be served (Acar & Gardner, 2012). Forecasts are made to reduce the uncertainty in the planning and distribution process of the supply chain (Fildes, Goodwin, Lawrence, & Nikolopoulos, 2009). Demand forecast methods assist in planning the purchasing and financing aspect of the supply chain. A good forecast model should have the following characteristics (a) realistic expectations, (b) absorptive capability of the service delivery, (c) laboratory and supply, (d) good management systems, (e) historical consumption data, and (f) real-time inventory system all through the supply chain (Acar & Gardner, 2012).

Demand forecasters can draw their forecast from different information and data. There are usually 17 categories of forecasting methods, out of which 12 categories rely on the forecasters' judgment based on own analysis, surveys, and determining intentions of the market (Stock & Watson, 2012). The remaining five categories depend on quantitative data (Stock & Watson, 2012). In order to improve forecasting methods, the

demand forecasters must match the forecast methods that they will use to the problem and existing conditions.

Forecasting methods. Forecasting methods are different for various products and contexts (Stock & Watson, 2012). In every program, the forecast is only as good as the basis of the forecast, which is the relevant information about the supply chain from the consumers to the manufacturers. The three methods that are recognized for determining the amount of medical supplies needed in order for a healthcare supply chain to be successful are discussed next.

Morbidity-Based forecasting. This forecasting method is for new healthcare programs where there is no consumption data or trend, which will serve as the basis of the forecast (Vivas-Consuelo et al., 2014). In this sense, the demand for the medicine is based on the standard guidelines of using the medicine.

Adjusted consumption-based forecasting. In many situations, combinations of the two methods would be the best option. The adjusted consumption-based forecasting is used when there is no reliable consumption, logistics, or morbidity data (Vivas-Consuelo et al., 2014). In this sense, the demand forecasters try to predict the expected need for the target region without any basis.

In India, the two best methods in 2015 would be Morbidity-Based forecasting and Adjusted Consumption-Based Forecasting because there is still no institutionalized structure that gathers reliable data from relevant people involved in the supply chain.

Forecasting market size. External factors influence the market size in any industry. For example, the demand for basketball apparel is influenced by the culture, size, gender, and age distribution of the population (Bazzani & Canavari, 2013). When it comes to fluctuating markets, forecasts are usually based on judgment. The Delphi technique is the best example of forecasting market size in fluctuating markets (Abraham & Ledolter, 2009). When there is sufficient and reliable information available, then the market is said to be established. As such, the demand forecaster can use different forecasting methods in order to determine market size such as time-series extrapolation methods, rule-based forecasting, and causal methods.

Improving forecast methods. Even though the chosen forecast models are evidence-based, and are appropriate to the problem and context of the situation, there are still ways to increase the accuracy of the forecast by combining and adjusting forecasts (Akhlaghi et al., 2011).

First, a forecaster must take into consideration how accuracy will be measured to determine whether forecasts have improved. Several error measures can be used to assess forecast accuracy. When it comes to evidence-based forecasting, most analysts recommend not to use the mean square error (MSE) because it is unreliable (McCarthy, Davis, Golicic, & Mentzer, 2006). The median absolute percentage error is the measure that most experts recommend because external factors do not affect it (Akhlaghi et al., 2011). Another recommendation is the cumulative relative absolute error (CumRAE) because it is easy to process and interpret (Akhlaghi et al., 2011).

Combining forecasts. One of the most powerful procedures in forecasting is to combine forecasts. It is useful when there is no reliable data to use as the foundation of the forecast. It can be useful when it comes to medicine forecasting because the true value or amount needed might be between two forecasts made. The extent of error when combining forecasts is relatively low, compared to relying in one forecast only. In fact, combining forecasts reduces the probability of error by half (Graefe, Armstrong, Jones, & Cuz, 2014).

Adjusting forecasts. Judgmental forecasts are biased forecasting methods. In order to come up with a reliable forecast, one must adjust the forecast based on evidence of bias from a parallel forecasting situation (Graefe et al., 2014). The forecast must be based on realistic conditions.

In summary to improve demand forecasts, organizations should use at least two different forecast methods so that there will be checks and balances with the forecast for medicine, update data regularly (i.e., logistics, consumption, and morbidity), and implement an automated or computerized system.

Importance of Transportation in Supply Chain

Transportation refers to the movement of products from one location to another, as the products are rarely produced and consumed in the same location (Tsao & Lu, 2012). Transportation is a significant part of the supply chain because it delivers the product from the production location to the consumption location. In addition, transportation represents one of the essential elements of the cost experienced by most

supply chains. In global supply chains, especially in the pharmaceutical supply chain, the role of transportation is even more crucial (Tsao & Lu, 2012).

Transportation is also the physical connection of all manufacturing plants involved in the supply chain (Chan & Zhang, 2011). The locations in a supply chain network are referred as nodes, and the connections are referred as links. When one group sells the product to another, transportation provides the delivery of that product. A disruption in the supply chain has an effect on all stakeholders.

Transportation is a vital function in any of the supply chains in the world. Supply chains use responsive transportation to reduce the storage cost by centralizing the inventory. In order to understand the role of transportation in the supply chain, it is important to consider the perspectives of the parties involved, carriers and shippers. The carriers make investment decisions regarding transportation equipment in order to maximize the return on investment of the assets. They decide whether to use trucks, airplanes or other modes of transportation. On the other hand, shippers use transportation to minimize the total costs of operation (e.g., transportation, inventory, facility). Shippers also provide an appropriate level of responsiveness to customers. Supply chain uses a mixture of various modes of transportation such as air, package, trucks, carriers, rails, water, and many more modes to be able to move products from one place to another.

Role of transportation in logistic chain. Logistic chain is part of the supply chain process that plans, implements, and controls the forward and reverse flow of goods, services, and related information between the point of origin to the consumer to meet

customer requirements (Bhattacharya, Kumar, Tiwari, & Talluri, 2014). There are five important terms in logistics: logistics, materials management, inbound logistics, physical distribution, and SCM (Bhattacharya et al., 2014). Logistics is the process of movement of materials and products in and out of the supply chain.

Materials management is about the movement of materials and components within a firm. Inbound logistics refers to the movement of materials received from the suppliers. Physical distribution covers the movement of goods outside the firm, from the production location to the consumption area. SCM has a larger scope than logistics. SCM oversights the process of moving and handling products from beginning of the production to the end customers with the goal in mind to satisfy customer needs and business competitiveness.

Logistics is the process of anticipating customer needs and wants. It is about the customer-oriented operation aspect of the SCM. Logistics must be managed well, as it covers the planning and managing of product movements with the goal of minimizing expenses while maximizing quality service to the customers (Tahvanainen & Anttila, 2011). Transportation has a crucial role that connects several networks in a supply chain that results in the conversion of resources into useful products for the consumer (Buyukkaramikli, Gurler, & Alp, 2014). The network consists of production / manufacturing plants, warehousing services, and retailers. In the manufacturing phase, the assembly of materials, components, supplies, inventory, and storage functions are managed within the factory.

A warehouse service is a logistics management center allowing quick movement of products by available transportation options. The manufacturers are involved in the production of goods and leave the rest to marketing and distribution entities to other teams involved in the supply chain. Warehousing and storage should also be considered in the production process or production distribution. The majority of the organizations use consolidation facilities and distribution centers than a single-user warehouse (Askin, Baffo, & Xia, 2014). This type of consolidated warehouse use offers better transportations services and improvement of logistics performance (Hofmann & Lampe, 2013).

Transportation costs in SCM. In the 1990s, there were many transportation services available, which were low-cost services compared to the cost of holding inventory and storing products in warehouses (Christopher & Holweg, 2011). In this period, there was a need for fast and frequent delivery to customers through various means, such as the just-in-time delivery. However, things have changed, as more companies are looking for long-term strategies in terms of their transportation costs in the supply chain (Prajogo & Olhager, 2012). The reason for this change is because of increased oil prices and the imbalance between supply and demand amongst transportation services, specifically the freight transportation services (Prajogo & Olhager, 2012). These instances have lead to high transportation costs and forced organizations to make necessary changes in their supply chain strategies to control concerns.

There are three shifts that have affected the transportation supply chain strategies of business firms today. The first shift was the change from offshoring to nearshoring (Ellram et al., 2013). Organizations decided it was cheaper to look for resources that are available near them and look for near locations to produce and sell the products that would minimize the transportation travel time.

The second shift was on the product design change from consumer attraction package to a more efficient design considering transportation challenges in mind (Khan, Christopher, & Creazza, 2012). These designs often consider the space efficiency in terms of size, shape, and protection of the products. The third shift was from having a lean inventory management to a hybrid of lean inventory and transportation management (Nag, Han, & Yao, 2014).

Companies having adopted these shifts in strategy indicate that the benefits of the change go beyond minimizing the challenges of transportation. These shifts have also improved both the supply chain and the financial performance because of lower costs and more investments that are productive.

Shift 1: Offshore to Nearshore sourcing strategies. Many firms are shifting their supply strategy from offshoring to the nearshore. This change is happening because of high oil prices with the goal of reducing the international transportation cost and the products' travel time. In addition, the shift to nearshoring offers additional benefits, such as reducing the disruptions at the shipping ports and avoiding the cross-country movement of products. The shortened distance and reduced risk of congestion would

mean that there would be fewer delays to the transportation aspect of the supply chain (Hajibabai & Ouyang, 2013). In general, this shift is both beneficial to the customer and to the supply chain. It would also lessen the transportation costs, which would reduce the cost of the product.

Nearshoring strategies also attempt to reduce the length of the transportation pipeline that would impact the freight costs, revenue, and inventory. The freight costs are reduced because there is a reduction in the miles traveled. Revenue is improved because this strategy offers shorter product travel distances, responding more efficiently to the needs of the market. Finally, the on-hand inventory is reduced because replenishment takes less time, as product availability is near (Hajibabai & Ouyand, 2013).

Shift 2: Product designs that emphasize shippability. The majority of the companies are redesigning their products to attract customers with the transportation issue in mind (Serdarasan, 2013). For instance, some products have a new formula, such as laundry detergent, dairy powder, and fruit juice to make them more concentrated. As such, the consumer only has to buy the product in small quantities with the same quality. In the area of consumer products, such as the toilet paper, transportation uses the smaller size cardboard tubes to reduce space when it is transported to other locations (Serdarasan, 2013). As a result, more toilet paper is transported at the same transportation costs. Some manufacturers have even eliminated the need for the cardboard tube in the middle.

Packaging also has been redesigned to optimize the package size and weights (Bourlakis, Maglaras, Gallear, & Fotopoulos, 2014). Most manufacturing companies use

lighter weight materials and remove the redundant packaging layers such as outer cartons. Products are lighter and come in small package sizes. These light and small package sizes also help lessen the transportation costs of the products (Closs, Speier, & Meacham, 2011).

For instance, pasta sauces and condiments can be purchased with flexible pouches, as opposed to the typical jars (Closs et al., 2011). This strategy has an impact on the supply chain. Before redesign of the package, most manufacturers are careful in the area of transportation. As such, this strategy helps to reduce the shipping weight and size of the product while maintaining the quality to attract the consumers. In addition, the revenue increases by means of better utilization of valuable shelf space. These changes would translate to cost savings in freight and packaging expenses, as well as space utilization.

Shift 3: Lean inventory strategies. The lean theory and practice has the aim of reducing inventory costs that would enable the firms to have more revenue (Li & Chen, 2013). Lean strategies adopted by companies include just-in-time delivery, small, fast, and frequent delivery methods using a dedicated fleet of transportation vehicles. However, with rising oil prices, these strategies were no longer an option for companies if they choose to have more revenue. Moreover, companies have to think of a balance between the inventory and transportation. As a result, companies have implemented a hybrid of the inventory and transportation strategies that would focus on the storage of

products and the reduction of transportation costs. Some shippers have turned to shipment consolidation.

These firms examine their shipment patterns in order to find ways to consolidate their shipments, as well as, considering a third-party logistics provider in order to ship products within the shared routes. Shippers are also considering the capacity utilization. The firms examine their capacity to ensure that capacity would be optimized for each shipment. Shippers are also looking at lower-priced alternative modes of transportation, such as relying on rail services rather than using truck services for long-distance shipment.

In the supply chain, these shifts reflect lower transportation costs that would offset the increased inventory costs of the firm. When a firm ships larger loads, higher levels of inventory on hand are secured. Some shippers would consider using the longer transit options such as the intermodal rail in order to replace the higher costs of using freight trucks. Moreover, the increase in inventory costs is offset by the reduction of costs through improved shipment frequency, shipment capacity, and vehicle utilization (Barney, 2012).

A firm's revenue increases because inventory is more available to fill the demands of the market with a shorter lead-time. The fact that transportation costs would replace the inventory costs does not mean that the inventory aspect would become less significant in the logistic supply chain. Quite the opposite, these hybrid inventory and

transportation strategies would highlight the balance between inventory and transportation costs (Barney, 2012).

Impact of transportation disruptions on supply chain performance. Transportation disruptions are caused by various issues, such as natural disasters earthquakes, terrorist attacks, congestion at ports, sanitary controls, time-consuming customs inspections, glitches in customs software, and lack of capacity in the transportation network to accommodate the demand or labor disputes among its employees (Qiang & Nagurney, 2012).

Transportation disruptions increase the lead time variability from the production to availability of the product to the consumers (Bueno-Solano & Cedillo-Campos, 2014). As such, companies needed to require greater levels of inventory safety stock. If the inventory safety stock is unchanged, the supply chain performance of on-time delivery and stock-out rates would ultimately decrease. Clients would not receive their products on time, and the costs would also increase because the demand of the product is higher than the supply. In a larger level, the delay or disruptions in large-scale freight also have a crucial impact on the economy of the country.

The backbone of the modern society is the supply chain transportation network. The reliability of this network has a vital role in the market. Any threat to the supply chain transportation network would be considered a weakness for the supply chain itself. In addition, unreliable transportation network would cause extra costs for the supply chain. It would also lead to a reduction in the efficiency of the system.

Transportation disruptions lead to the delay or even stoppage of the flow of products in the supply chain. For example, the terrorist attack on the World Trade Center resulted in a stoppage of assembly lines of Ford because of the delay of products in the Canadian and Mexican border (Cedillo-Campos, Sanchez-Ramirez, Vadali, Villa, & Menezes, 2014). Customs were very strict about inspecting each of the shipment that caused congestion at the airports and ports.

Impact of Supply Chain Best Practices

An organization's competitive advantage creates a defensible position in the market over its competitors (Barney, 2012). It includes the ability of the firm to be able to differentiate itself from its competitors in the market. The empirical literature on competitive advantage reveals that "identifying price/cost, quality, delivery, and flexibility as important competitive capabilities" (Barney, 2012, p. 4)**.** In addition, researchers have stated that time-based competition is a priority for an organization if it wants to develop or maintain its competitive advantage.

A framework for competitive advantage includes the following: "competitive pricing, premium pricing, quality, dependable delivery, and production innovation" (Barney, 2012, p. 4). As such, the dimensions of competitive advantage include the price of the product, the quality of the product, the delivery dependability of the product, and the innovative capability of the product.

Organizational performance is about whether the organization has achieved its market-oriented goals, as well as the financial goals (Deshpande, 2012)**.** The short-term

objectives of SCM refer to the increased productivity of the production phase and to reduce the inventory cycle time. The long-term objectives of SCM are to increase the market share of the organization, as well as an increase in the profit for all members of the supply chain. Any organizational initiative that includes the SCM should lead to an increase in organizational performance.

Based on a review of literature published to date, it appears that lack of best SCM strategies, knowledge, and skills in the healthcare industry has an impact on organizations SCM cost associated with the production, transportation, procuring, forecasting and inventory holding (Ellegood, 2014). Leaders of healthcare business organizations are interested in identifying and implementing best practices in SCM processes, to reduce the operating costs, improve profitability, and facilitate increased availability and distributions of medicines to patients in desperate need.

A review of the literature indicated that, to date, more researchers conduct quantitative than qualitative analyses. The qualitative nature of this study may contribute to a fresh, in-depth, holistic perspective to the SCM strategies that Indian business leaders could use in the healthcare industry to reduce the high costs associated with SCM.

Transition

In Section 1, I presented the background of the problem; problem statement; purpose statement; nature of the study; research question; interview questions; conceptual framework; definition of terms; assumptions, limitations, and delimitations; significance of the study; and review of the professional and academic literature. Previous authors

have focused much of their research surveying and interviewing top management and supply chain experts to gain an understanding of the SCM strategies that Indian business leaders have used in the healthcare industry to reduce the high costs associated with SCM (Ellegood, 2014; Gjerdrum et al., 2012; Haq & Boddu, 2015; Saberi et al., 2012). Several researchers provided information to improve the SCM strategies and results of an organization implementing improvement processes.

In Section 2, I will reinstate the purpose statement and presented the role of the researcher, study participants, research method and design, population and sampling, ethical research, data collection, data analysis, and reliability and validity of the study. In Section 3, I will reintroduce the purpose statement, provide a brief summary of the findings in the introduction, discuss in detail the application of the study to professional practice, present the implications for social change, and conclude the section with my recommendations for action and further research.

Section 2: The Project

This section outlines the methodology and data collection process used in exploring the supply chain distribution practices and processes of medicine companies in India. In addition, this section presents: (a) the restatement of the purpose, (b) methodology, (c) the role of the researcher, (d) study participants, (e) justification of the research method and design, (f) population demographics and sampling utilization, (g) data collection, (h) data analysis techniques, (i) reliability, and (j) validation factors.

Purpose Statement

The purpose of this qualitative study was to explore the SCM strategies that Indian business leaders have used in the healthcare industry to reduce the high costs associated with SCM. I used a case study research design approach to explore the SCM-related problems in the distribution of pharmaceutical drugs in India.The sample population consisted of three business leaders working in India healthcare organizations that are successful in using SCM strategies to reduce the high costs associated with SCM. These individuals are the key stakeholders who have the responsibilities to manage the SCM strategies. The research design included the following data sources: (a) semistructured interviews, (b) company documentation, and (c) observations. The social impact of this study was that its results may enable leaders of healthcare business organizations to identify and implement best practices in SCM processes in order to reduce operating costs, improve profitability, and facilitate increased availability and distributions of medicines to patients.

Role of the Researcher

The researcher is responsible for developing and executing a study report (Yin, 2014). Critical researcher responsibilities include: (a) creating and asking relevant questions, (b) interpreting responses from research studies, (c) maintaining flexibility to unforeseen happenings, and (d) maintaining an understanding of the research problem (Yin, 2014).

The accuracy of a qualitative study depends on the experience of the researcher and his or her ability to draw conclusions from the data based on the results (Bernard, 2013). I am an experienced business and information technology professional with over 18 years of experience in pharmaceutical industry. I hold a Master of Science (MS) degree in computer science and am a certified project manager with overseeing responsibilities of pharmaceutical clinical supplies distribution. I applied my skills and experience as part of this research study.

In conducting this qualitative case study, I performed all tasks associated with data collection and analysis of the study. In qualitative research, the researcher is the key instrument and described that researchers must remain unbiased (Marshall & Rossman, 2011). Researcher bias can change the direction or result of the case study (Yin, 2014). I was unbiased, impartial, and nonjudgmental throughout the research process.

The tasks included recruiting a minimum of three business leaders working in healthcare organizations in India who were open to sharing their insights on SCM strategies that could be used by other business leaders to reduce the high costs associated

SCM. In addition, I asked permission of participants to audio-record the interview session to ensure the accuracy of transcriptions. I developed the semistructured interview questions and conducted individual interviews via Skype with each of the participants who agreed to be part of the study.

The interview protocol is important because some participants may decide not to participate in a study based on interview protocol alone especially if the study focused on a sensitive topic (Leedy & Ormrod, 2013; Knox & Burkard, 2009). Also, different researchers could run parallel studies each using different levels of interview protocol structures. The findings of these studies with respect to the richness of the data and similarities of results may reveal useful information about strengths and weaknesses of different interview protocol designs (Knox & Burkard, 2009).

Researchers should follow a basic code of conduct while undertaking case study (Yin, 2014). The Belmont Report (National Commission for the Protection of Human Subjects of Biomedical and Behavioral Research, 1979) provides ethical guidelines for the following three principles: (a) beneficence, which means that the researcher must increase benefits while minimizing risk; (b) respect for persons voluntary involved in research; and (c) justice, fair distribution of benefits and risks for potential research subjects (Cugini, 2015). Similar to Cugini (2015), as a researcher, I followed the ethical guidelines, as outlined by the Belmont Report, and the strict confidentiality of their participants concerning the handling of the responses and their anonymity in all documentation of the study.

Participants

The quality and validity of a research study consist of the study's: (a) population, (b) contact method, (c) participation rate, and (d) refusal rate (Cox, 2012; Morton, Bandara, Robinson, & Carr, 2012; Tufford & Newman, 2012). The population in this study included business leaders having the accountability to manage the medicine supply chain and distribution in India. The participants are part of a pharmaceutical organization and members of the SCM group with supervisor responsibilities to manage the medicine supply chain and have been in their role for at least two years. These business leaders rely on SCM employees and distribution professionals to manage the medicine distribution to retailers and end users. Thus, distribution professionals are knowledgeable in the day-to-day operations, practices, processes, and challenges of distributing medicines.

Moustakas (1994) suggested that in qualitative research, experiences of the phenomenon serve as the basis for selection of study participants. Guest, Bunce, and Johnson (2006) suggested that guidelines for determining nonprobabilistic sample sizes are virtually nonexistent. Miles, Huberman, and Saldana (2013) concluded that a smaller sample size, as opposed to a larger sample size is sufficient in qualitative research. The population frame for this research study consisted of leaders of SMEs included in my professional and social network. For the last 15 years, I have been working in the pharmaceutical industry, specifically Pfizer, and have established good connections with leaders of other organizations. I leveraged these relationships to recruit the right

participants to this study. In addition, by explaining the purpose of the study and its potential benefits to society I built the trust in working relationship with participants.

Upholding ethical principles throughout the research process is critical (Fiske & Hauser, 2014; Gibson, Benson, & Brand, 2013; Oquendo, Stanley, Ellis, & Mann, 2014). To protected participants' rights, I used the coded data and stored all electronic information on a password-protected laptop.

Research Method and Design

The research method and design provide the framework that bound the research project. Qualitative studies focus mainly on providing an in-depth understanding of the central phenomenon while quantitative studies are focused on describing trends and explaining relationships between variables (Bhattacharya et al., 2014; Cox, 2012; Tufford & Newman, 2012). I employed qualitative methodology because it supports a deep, open-ended exploration of distribution practices and challenges in a bounded system, which is the distribution network of medicines in India. This research method is consistent with the purpose of the study, which focused on understanding a phenomenon rather than measuring constructs. Therefore, I employed a qualitative methodology to explore the SCM strategies that Indian business leaders have used in the healthcare industry to reduce the high costs associated with SCM.

Research Method

A quantitative study would not provide the depth of insight or details that are required to investigate the issue and is limited by narrowly defined variables (Corbin,

2014; Ella, Kangarloo, & Daly, 2013; Golicic & Davis, 2012). Therefore, quantity research methodology was not selected. Mixed-methods research methodology is a combination of both qualitative and quantitative methods, typically using a pragmatic worldview, which includes multiple data types to understand the problem (Ella et al., 2013; Golicic & Davis, 2012; Yin, 2014).

The purpose of this study was not to support the results based on preconceived hypothesis, but rather to explore the SCM strategies that Indian business leaders have used in the healthcare industry to reduce the high costs associated with SCM. A mixed method approach might have provided a further intense view into the research topic; however, the mixed method research approach was not most viable research option for this study given the additional complexity. For this reason, I did not selected the mixed method research method.

I selected the qualitative research method for my study. The qualitative research method incorporates open-ended questions that represent the basis for an in-depth exploration of the phenomenon (Corbin, 2014; Hays & Singh, 2012; Marshall & Rossman, 2011). A qualitative approach provides a rich description of the activity taking place (Corbin, 2014; Hays & Singh, 2012; Marshall & Rossman, 2011). The qualitative method is appropriate for studies that explore the specific phenomenon in a real setting that is not readily available using the quantitative method (Corbin, 2014; Cox, 2012; Tufford & Newman, 2012). Therefore, I determined that the qualitative research method was the most appropriate for this inquiry over other research methods.

Research Design

The purpose of this qualitative study was to explore the SCM strategies that Indian business leaders have used in the healthcare industry to reduce the high costs associated with SCM. The five major types of qualitative research design approaches include ethnography, grounded theory, phenomenology, content analysis, and case study (Hays & Singh, 2012; Nakai, 2012; Yin, 2014). The case study research design approach was deemed most appropriate for this study because I asked participants to answer open-ended questions regarding current practices, experiences, disruptions, and challenges faced in distributing medicines in India. The use of a qualitative approach allowed me to collect data that are specific to a particular context to understand an issue, as recommended by several scholars (Hays & Singh, 2012; Nakai, 2012; Yin, 2014). In this case, that issue is the distribution practices, processes, disruptions, and challenges for medicines in India.

I determined that a case study research design approach was the best suited for this study. I considered other qualitative research design approaches but deemed inappropriate because they are not best suited for the purpose of my study and the available resources. For instance, the purpose of the grounded theory research design approach is to generate alternative treatment theories or methods (Corbin, 2014; Ella et al., 2013; Mena, Humphries, & Choi, 2013). For this reason, it was not suitable for this study. Action research requires unrestricted access to the participants (Berg, 2004; Corbin, 2014; Yin, 2014) and, consequently it was not suitable for my study.

I did not use a phenomenological research design approach because it focuses on the exploration of perceptions of the participants in a particular phenomenon based on their lived experiences. A phenomenological study on this topic would focus on the lived experiences and the participants' personal interpretation of the lived experiences in terms of distributing medicines. Thus, this could provide subjective interpretations, which could provide bias interpretations on practices and challenges encountered in distribution facilities (Bourlakis et al., 2014; Corbin, 2014; Silvestro & Lustrato, 2014).

According to Yin (2014), the goal of case studies is to understand complex social phenomena, such as organizational and managerial processes. This particular study focused on the process used to distribute medicines down the supply chain in distribution facilities. In the data collection process, the interviews represent one of the most important aspects of a qualitative case study (Hays & Singh, 2012; Corbin, 2014; Yin, 2014). The concept of data saturation, originally developed for grounded theory studies but applicable to all qualitative research that employs interviews as the primary data source, entails bringing new participants continually into the study until the data set is complete, as indicated by data replication or redundancy (Cox, 2012; Marshall, Cardon, Poddar, & Fontenot, 2013; Tufford & Newman, 2012). I conducted individual interviews by Skype with each of the participants until the data set was complete and the required quality was achieved.

Population and Sampling

The purpose of this qualitative study was to explore the SCM strategies that Indian business leaders have used in the healthcare industry to reduce the high costs associated with SCM. The target population for this study was business leaders, distribution managers, and professionals working in medicine distribution facilities in India. I identified the participants based on their expertise of medicine distribution to ensure that their answers would help me respond to the overarching research question posed in this study. I selected purposefully sampling inclusive of professionals who had the same function for at least two years.

Multiple types of sampling strategies and techniques are available to achieve the goals of qualitative research. Acharya, Prakash, Saxena, and Nigam (2013) posited purposive sampling for case study design as less expensive than random sampling and more conducive to the study. Consequently, I used a purposive sampling technique to gather participants for the study. A purposive sampling technique is a nonprobability sampling technique where the gathering of participants focuses mainly on individuals who could provide valuable insights regarding the phenomenon considered in the study (Bhattacharya et al., 2014; Evans & Buehner, 2011; Gligor, Holcomb, & Stank, 2013).

Purposive sampling requires researchers to select deliberate participants with an explicit purpose in mind, specifically to address the purpose of the research. This technique is typically designed to pick a small number of cases or participants that will yield more information about a particular phenomenon (Corbin, 2014; Evans & Buehner,

2011; Yin, 2014). According to Corbin (2014), there is no sample set size necessary for qualitative studies. However, it is critical to ensure that the sample size is not too small to achieve data saturation or too large that it is difficult to conduct data analysis. To achieve the data saturation, I conducted three interviews with each individual participant. The first interview was to capture in-depth data, with the second interview served as a follow-up while the third interview provided an opportunity for member checking. Marshall and Rossman (2011) stated that additional interviews may be required until the researcher achieves data saturation. I followed up with the participants to seek additional information or clarification on previously answered responses to ensure data saturation.

Ritchie, Lewis, Nicholls, and Ormston (2013) stated that it is impossible to do justice to the richness of the data yielded if the sample is large scale. However, small sample size only works if good purposive sampling has taken place (Evans & Buehner, 2011; Gligor et al., 2013; Ritchie et al., 2013). The participants received an assurance that their privacy and confidentiality will be maintained all times. All data collected from participants will remain in a safe place and the data analyzed do not include their names. I informed the participants and will destroy the collected data 5 years after completion of this study to comply with Walden University's requirements for a DBA doctoral study.

Ethical Research

The safety and confidentiality of the participants are the most important ethical aspect of conducting the study. This study is not controversial or sensitive in nature and did not present any ethical concerns. I followed Walden University's Institutional Review

Board's (IRB) guidelines and did not start my study until IRB approval has been granted. I conducted this study under the Walden University IRB approval number 11-10-15-0171351. Ritchie et al. (2013) described the role and responsibilities of a researcher during planning and execution of the study to protect the anonymity of the informants, by assigning numbers or aliases to individuals. Further, to gain support from participants, I explained the purpose and benefits of the study to them (Evans & Buehner, 2011; Gligor et al., 2013; Ritchie et al., 2013).

I answered all prospective participants' questions and/or concerns pertaining to this study prior and/or during this study. Participation was voluntary, and no compensation was given to any participants in this study. Any employee participating in the study was given the choice not to take part or to withdraw from the study, even after it had begun. Refusal to participate or withdrawal from the study did not involve penalty or loss of benefits for either participant or myself. Unanticipated ethical issues did not arise during the course of the study due to the nature of qualitative research. The primary ethical issue that will demand attention is that of confidentiality and privacy of the participants (Corbin, 2014; Gibson et al., 2013; Oquendo et al., 2014).

To circumvent issues of confidentiality, the researcher asked for the anonymity of the participants signing an informed consent form (see Appendix A) to ensure that they agree to participate in this study. Moreover, I used fictitious names of people and institutions. Informed consent ensured that participants entered the study voluntarily and understood the focus of the study, as recommended by the experts (Gibson et al., 2013;

Hays & Singh, 2012; Oquendo et al., 2014). This study did not employ any identifiable information throughout its duration. Moreover, the researcher kept the data gathered from this study in a password-protected computer and stored in a locked cabinet. I am the only person with access to the data and will destroy them five years after the completion of the study to comply with Walden University's requirements for a DBA doctoral study (Ekekwe, 2014; Ellegood, 2014; Sapp, 2014).

Data Collection Instruments

One essential skill for data collection is to stay aligned (Corbin, 2014; Moustakas, 1994; Yin, 2014). To stay aligned, a researcher must have a clear interpretation of the purpose of a study and be able to make an unbiased, analytical judgment throughout the data collection activities (Corbin, 2014; Moustakas, 1994; Yin, 2014). Upon approval from Walden University's IRB to conduct the study, potential participants were contacted (see Appendix B) via email. I scheduled interviews when enough contacts agree to participate in the study. A qualitative researcher is the main instrument for data collection (Leedy & Ormrod, 2013; Moustakas, 1994; Yin, 2014). For this reason, I was the primary data collection instrument for my study.

The interview protocol sometimes referred to as *Interview Guide*, is the secondary instrument throughout the interview with all participants (Leedy & Ormrod, 2013; Merriam, 2014; Moustakas, 1994). I developed an interview protocol (see Appendix C) to ensure that interview questions yield specific information needed to address the study's guiding question and sub-questions. I conducted semistructured interview sessions

through the Skype to observe participants while responding to the interview questions and to gather qualitative data for this study. Using the same interview protocol throughout the study assisted me to ensure the consistency of the semistructured interviews.

Semistructured interviews involved open-ended questions, which allowed participants to express and share their perspectives, insights, and knowledge using their own words. Participants were encouraged to share their experiences and to believe that their opinions are important, as recommende by several scholars (Drew, 2014; Lincoln & Guba, 2011; Merriam, 2014). Marshall and Rossman (2011) argued that semistructured interviews are the most effective means for the researcher to gain a deep understanding of an individual's experience and fully address the research question. The use of semistructured interview questions ensures that the interview questions address the suggested research inquiry (Drew, 2014; Lincoln & Guba, 2011; Merriam, 2014). The responses of participants to the interview questions were analyzed using Krippendorff's (2013) content analysis.

Member checking was defined as a tool to assure data credibility and validity (Corbin, 2014; Harper & Cole, 2012; Lincoln & Guba, 2011). Marshall and Rossman (2011) defined *member checking* as a process whereby the researcher provides participants with the opportunity to review the interpretation of their responses in support of data completeness and interpretation accuracy. I sent the interview transcribed data back to the participant to ensure the accuracy of the data. When participants were

provided a transcript to *member check* for accuracy, a few additional questions were asked to expand upon original answers to offer additional information.

Further, I used data triangulation to ensure the reliability, confidence, and accuracy of data. I used different data sources in the triangulation, including (a) semistructured interviews, (b) company documentation, and (c) observations. Triangulation is the process of validating data findings using multiple sources of data, individuals, theories, or different data collection methods (Corbin, 2014; Harper & Cole, 2012; Lincoln & Guba, 2011). The data are indicative of associated themes across multiple data sources that aided in the assessment, interpretation, and development of conclusion from the information collected.

Data Collection Technique

When the researcher's goal is to obtain knowledge on a particular topic with a prepared number of questions, the researcher should use a semistructured interview (Marshall & Rossman, 2011; Rubin & Rubin, 2012; Yin, 2014). Researchers use probing questions to obtain the most relevant, accurate, and in-depth information (Marshall & Rossman, 2011; Rubin & Rubin, 2012; Yin, 2014). If the study participants did not fully address the questions inquired or shared an inadequate answer, rephrasing strategies and probing questions stimulated additional related responses.

The population for this study consisted of three business leaders having the responsibility to manage medicine supply chain strategies and distribution in India. The participants are part of a healthcare organization and members of SCM group and have

been in the role for at least two years. Upon approval from University's IRB to conduct the study, potential participants were contacted (see Appendix C) via email to confirm their participation and secure the signed informed consent form (see Appendix A), and conducted the pilot study before scheduling the interview.

Moustakas (1994) noted that repeatability and consistency in the data collection technique increase the dependability and relevance of each event (see Appendix C). All interviews were recorded and each interview took 25 to 30 minutes to conduct. The target population for this study was business leaders, distribution managers, and professionals working in medicine distribution facilities in India.

The telephone interview data collection technique has been judged to be rich, vivid, detailed, and of high quality (Corbin, 2014; Rubin & Rubin, 2012; White, Castleden, & Gruzd, 2014). Telephone interviews can be an effective method of data collection when interviewers understand the potential benefits and challenges. The advantages of a telephone interview include that it (a) can reach wide geographical locations, (b) can reach the potential participants residing in the restricted site access locations, (c) has access to dangerous or politically sensitive site participants, (d) can reach multiple participants in various locations in one day, and (e) has no travel costs (Hancock & Algozzine, 2011; Rohde, Lewinsohn, & Seeley, 2014; White et al., 2014).

The potential disadvantage of a telephone interview is that the interviewer has no view of the situation in which the interviewee is situated, and less social and nonverbal cues are observed (Hancock & Algozzine, 2011; Rohde et al., 2014; White et al., 2014).

To overcome this challenge, I gathered data from conducting semistructured interviews through Skype at potential participants' convenient time and location to ensure that participants are in a comfortable place. Ensuring the comfort of participants allowed them to give their opinions and ideas freely regarding the subject.

Case study researchers often opt to review existing documentation related to the research questions (Hancock & Algozzine, 2011; Rohde et al., 2014; White et al., 2014). In addition to conducting the semistructured interviews with business leaders and subject matter expertise in SCM, participants' company documentation was used as another source of data collection. Before closing my interview facilitation with each participant, I requested the participants to share their company SCM processes and procedures documentation via email. The study population was narrow enough to produce a clear outcome based on qualitative data obtained through interviews and from inspecting company documentation.

Upon approval from Walden University's IRB to conduct the study, I conducted a pilot study. Pilot testing is a critical element of research validity (Merriam, 2014; Sapp, 2014; Yin, 2014). I conducted the pilot study using one business leader and one employee, not participating in this study, who have been successful in taking advantage of the best practices and SCM knowledge in India. I contacted them (see Appendix B via telephone to confirm their participation and secure the signed informed consent forms (see Appendix A) before scheduling the pilot interview.

Conducting the pilot study was to assess the research design will produce the results as intended. In addition, it gave me an opportunity to revise the interview questions as needed to achieve the study objectives, and resolve the interview protocol (see Appendix C) execution difficulties. In the event, pilot study results would have suggested revising interview questions or the interview protocol, I would have reached the pilot participants again to collect additional data using revised questions.

To overcome this problem, I formulated the interview questions to ensure that participant responses will provide valuable insights regarding the research questions planned in this study. The interview questions are based on researching the content of the study, the literature review, and my experience. To ensure the reliability, I used the expert validation strategy, which involves presenting the interview questions to experts for their views (Ekekwe, 2013; Merriam, 2014; Yin, 2014). I reviewed the interview questions with experts from Pfizer to ensure that the questions are relevant and that the interview protocol achieves trustworthiness, credibility, dependability, and clarity.

Member checking occurs by allowing participants in the study to review transcriptions and initial interpretations (Corbin, 2014; Harper & Cole, 2012; Lincoln & Guba, 2011). Upon completion of the interview, I transcribed the recorded interview and shared it with study participants requesting their review of their answers to interview questions to ensure the accuracy of the data. If there is a need to make changes to the original transcribed data, I documented the changes in a separate log for tractability purposes.

I took the time to perform *member checking* interviews to gain more in-depth information, accuracy, credibility and to reach the data saturation. As the data unfolded, patterns of both regularities and irregularities were sought. As themes emerged, categories were created, allowing information to be sorted. In addition to *member checking*, I used data triangulation to ensure the reliability, confidence, and accuracy of data.

The selection of the appropriate method, design, and instrumentation will ensure the assembly of accurate data and enabled the formation of accurate conclusions (Frels & Onwuegbuzie, 2013; Hancock & Algozzine, 2011; Rohde et al., 2014). Data saturation occurs when no new data add to the findings or themes. Additional interviews may be required until the researcher achieves data saturation (Guest et al., 2006; Marshall & Rossman, 2011; Moustakas, 1994). I followed up with the participants to seek additional information or clarification on previously answered responses to ensure data saturation, as the focus is to retrieve extensive and influential responses.

Data Organization Technique

Data organization and analysis assist the researcher in answering the overarching research question (Basurto & Speer, 2012; Cassell & Symon, 2011; Wahyuni, 2012). For easier retrieval and analysis, I stored all the collected data in an electronic form in a secure folder on the external hard drive. In addition, I kept track of each (a) signed consent form, (b) invitation to participate in the study, (c) interview transcripts and interpretation of each interview data for *member checking*, (d) audio recordings, (e)

company documentation, (f) research logs, (g) reflective journals, and (h) labeling system of paper and electronic forms of data.

I transcribed the audio recorded responses into Microsoft Word and reviewed them with participants first for their concurrence with their answers, and then use it for analysis. In the event that a participant's response does not generate the required evidence or does not match the degree of correspondence, information from that participant will not be considered in the analysis (Cassell & Symon, 2011; Wahyuni, 2012; Yap & Webber, 2015).

To ensure the confidentiality and anonymity of the participants, no identifiable information was documented in the study. A researcher can achieve confidentiality and anonymity of each participant by assigning generic codes to each participant (Bell & Waters, 2014; Gibson et al., 2013; Hancock & Algozzine, 2011). For cataloging, I indicated the coded sequential representation of the participants' name (e.g., 'respondent 1') on the copy of the consent form and the audio recordings. In addition, I used the generic naming convention while saving the scanned copies of signed consent (see Appendix A), participant invitation (see Appendix B), audio recordings, and the interview transcriptions.

A research log is an ongoing diary of a researcher tracks of the progress of research (Bell & Waters, 2014; Merriam, 2014; Yin, 2014). I kept track of the research log with planned and completed literature searches, the purpose of each search and, a summary of findings with notes. In addition, I documented my research experience in a

reflective journal with the details of what happened and why and, what can I learn to improve the process.

Qualitative analysis requires grouping and regrouping raw data into themes and subthemes and organizing them into classifications constructed on thematic exploration (Leedy & Ormrod, 2013; Merriam, 2014; Moustakas, 1994). I organized the collected data into different themes to make the analysis easier. Yin (2014) noted that there is no way to anticipate which themes will emerge from the collected data when contemplating a prior coding.

I secured both paper and electronic data in a locked cabinet. I am the only person who has access to the secured cabinet. I will destroy the files and data five years after the completion of the study to comply with Walden University's requirements for a DBA doctoral study (Ekekwe, 2014; Ellegood, 2014; Sapp, 2014).

Data Analysis

Credibility concerns the confidence in the result. Triangulation involves using more than one data source to study a phenomenon and has been found to be beneficial in providing confirmation of findings, more comprehensive data, increased validity, and enhanced understanding of studied phenomena (Bekhet & Zauszniewski, 2012; Basurto & Speer, 2012; Yin, 2014).

I adopted multiple threat mitigation strategies such as sending interview transcripts to each interviewee for correction (i.e., *member checking*), data triangulation, detailed documented steps of data collection, processing, and analysis (Duc, Mockus,

Hackbarth, & Palframan, 2014; Harper & Cole, 2012; Lincoln & Guba, 2011). Using data triangulation of source, I used the same interview protocol (see Appendix C) throughout the study to ensure the consistency of the semistructured interviews. Using data triangulation, I identified themes from multiple data sources, that aided in the assessment, interpretation, and conclusion of the information collected.

Qualitative data analysis is essentially about detection and the task of defining, categorizing, theorizing, explaining, exploring, and mapping (Duc et al., 2014; Harper & Cole, 2012; Ritchie & Spencer, 2002). The first step in the analysis is the design phase, which defines the context of the analysis and identifies what needs to be known but is not directly observable. The design phase specifies the empirical procedures for analysis and the conditions that make the inferences based on the data. Data are collected from the responses of participants to open-ended questions to gain insights and to answer the overarching research question posed in this study (Bhattacharya et al., 2014; Cox, 2012; Tufford & Newman, 2012).

The second stage defined the units of analysis, which makes it possible to draw a statistically representative sample from the available data. *Member checking* served as a tool to increase the accuracy and credibility of the data. The third step is sampling, which facilitated the reduction of biases inherent in the type of data collected.

The fourth step codes the gathered data and classifies them into themes. Researchers use text coding to categorize the data into key themes (Yin, 2014). Coding and categorization allow the researcher to classify, sort and arrange the information in the

most efficient, uniform manner (Basurto & Speer, 2012; Cassell & Symon, 2011; Wahyuni, 2012). I assigned random codes to each participant to preserve the confidentiality and to make it easier to organize and classify the data.

The fifth step necessitates the drawing of inferences, which is the most crucial phase in content analysis. During this step, the analyst determines the relationship of the accounts of coded data to the phenomena under investigation and produces new ideas, theories, or strategies. The last step involves the validation of the data and the development of the inferences based on the data. Krippendorff (2013) asserted that the content analysis is used to infer what is not directly observable.

The features and capabilities of the NVivo 10.0 software are useful in achieving organization, modeling, and understanding of the unstructured information (Ellegood, 2014; QSR International, 2015; Sapp, 2014). I encoded the transcribed data in the NVivo 10.0 tool to prepare for data analysis. NVivo 10.0 is a qualitative data analysis software used to identify themes and similar responses from participants. I used the Krippendorff method of content analysis to process the data. According to Krippendorff (2013), content analysis can be used to generate inferences from large bodies of data that reveal trends, patterns, and differences. Content analysis allows the objective treatment of qualitative data regardless of the bias of the content analyst.

Throughout the data analysis, careful consideration for design, analysis, approach, and processes assisted me to ensure the study results are reliable and valid. Goldratt (1990) TOC framework was used to attain the organizational performance. TOC

framework is designed to facilitate a systematic analysis within the demands of constraints. The TOC framework provided a useful basis for this study because it encourages business managers in the healthcare industry to identify solutions to reduce the high costs associated with SCM.

Based on data analysis and emerging trends, I focused on the key themes related to the organizational performance and compare them with the literature, inclusive of newly published studies, as well as the conceptual framework used in this study. The use of NVivo 10.0 was helpful in discovering subtle connections in collected data that could be missed in manually analyzed data. In addition, NVivo 10.0 supports the rigorousness needed to justify the research findings with the original data that support the finding (Ellegood, 2014; QSR International, 2015; Sapp, 2014).

Reliability and Validity

From a qualitative perspective, the validity of a research study's data will be enhanced when the researcher establishes trustworthiness (Corbin, 2014; Hays & Singh, 2012; Merriam, 2014). With this in mind, the researcher attempts to achieve objectivity, validity, and reliability of the study as much as possible.

Reliability

One of the major concerns of research studies is to maintain reliability and trustworthiness throughout the research. Facilitating reliability in qualitative research can be demanding because of the underlying concerns associated with its consistency (Corbin, 2014; Hays & Singh, 2012; Merriam, 2014). I collected data from interviews

and explicitly describe the role of the researcher to the interview participants. An interview protocol (see Appendix C) served as the secondary instrument throughout the interviews with all participants. Using the same guide with the same questions in consecutive order assisted me to establish and ensure the consistency of the semistructured interviews.

Merriam (2014) identified several relevant strategies in describing the reliability, dependability, and audibility of qualitative research. Lincoln and Guba (2011) suggested the notion of dependability as an alternative criterion for judging the reliability and trustworthiness of qualitative research. The reliability of this research study included an in-depth description of the processes for data collection, analysis, and interpretation.

Dependability requires the researcher to consider the constant changes within the context of which the research occurs. Dependability is not measurable and needs to be established using other qualitative means, such as *member checking* and triangulation (Duc et al., 2014; Harper & Cole, 2012; Lincoln & Guba, 2011). I included the *member checking* and triangulation in this study to provide the interviewees with the opportunity to clarify the interpretation and possibly furnish supplemental perspectives on the study. Quality control measures, including member checking, pilot testing, and transcript review, can ensure a more accurate and unbiased study (Lincoln & Guba, 2011; Merriam, 2014; Yin, 2014).

Merriam (2014) suggested that a researcher (a) use clear research questions, (b) explicitly describe the researcher's role, (c) ensure meaningful findings paralleling data

sources, (d) connect reliability to theory, (e) broadly collect data, (f) perform data checks, and (g) use peer review. Following the IRB guidelines maximized the protection of human subjects and increased the reliability of the study processes and avoided potential data corruption. Introducing bias, whether intentional or not, could negatively affect the validity of the data.

Validity

The objective of the qualitative research is to present a perspective on the issue and offer reports that reveal the researcher's capacity to describe the phenomena of interest. Merriam (2014) suggested that internal validity, credibility, and authenticity is realized when (a) research appears reasonably vicarious to readers, (b) triangulation of data sources produce comparable conclusions, (c) data are connected to emerging theory, and (d) conclusions are significant to informant. Data triangulation further supports and enhances credibility (Duc et al., 2014; Harper & Cole, 2012; Lincoln & Guba, 2011). To increase the credibility, I used the *member checking* and triangulation methods.

The external validity, transferability, and fittingness is realized when (a) researchers use detailed description for readers, (b) findings are consistent with experiences of participants, (c) the study supports further testing, and (d) the study is easily replicated (Marshall & Rossman, 2011; Merriam, 2014; Yin, 2014). Transferability refers to the degree to which the researcher can generalize or transfer qualitative research results to other settings (Lincoln & Guba, 2011; Merriam, 2014; Yin, 2014). Marshall

and Rossman (2011) discussed that transferability should be left to the researcher planning the next study.

Confirmability refers to the degree to which the results could be confirmed or validated by others. Researchers should identify their biases at the outset of the study and use the external audits to ensure validity (Lincoln & Guba, 2011; Merriam, 2014; Yin, 2014). NVivo 10.0 software is a proven qualitative tool to auto code and organizes data (Leedy & Ormrod, 2013; Sapp, 2014; Yin, 2014). I used the NVivo 10.0 tool for grouping the raw data into key themes. In this process, the tool assisted me to overcome bias and researcher interests. This process served as the external validity of this study.

Data saturation occurs when no new data add to the findings or themes. Triangulation of data sources, writing detailed-thick descriptions, and *member checking* are reasonable, as well as time and cost-effective to facilitate (Denzin, 2012; Harper & Cole, 2012; Walker & Jones, 2012). I used the following strategies to assure the data saturation validity: (a) triangulation strategies, (b) peer review and debriefing, (c) research bias clarifying, (d) member checking, (e) thick and descriptive writing, and (f) external audits.

Transition and Summary

I used a qualitative case study design to achieve the purpose of the study, which was to explore the SCM strategies that Indian business leaders in the healthcare industry have used to reduce the high costs associated with SCM. I used a purposive sampling technique to gather distribution professionals who could provide valuable insights for the

study. I administered semistructured interview questions, composed of open-ended questions to note the responses. Using Krippendorff's (2013) content analysis with the aid of NVivo 10.0, I analyzed the responses of the participants. In addition, I used the thematic categories and emergent themes identified to address the overarching research question posed for this study. In Section 3, I reintroduced the purpose statement, provided a brief summary of the findings in the introduction, discussed in detail the application of the study to professional practice, presented the implications for social change, and concluded the section with my recommendations for action and further research.

Section 3: Application to Professional Practice and Implications for Change

Section 1 and 2 included an explanation of this study's importance to business leaders, as well as detailed information regarding the study's design and implementation procedures. This section includes: (a) overview of the study, (b) presentation of the findings, (c) application to professional practice, (d) implications for social change, (e) recommendations for action, (f) recommendations for further study, (g) reflections, and (h) study conclusions.

Overview of Study

Supply chains prove critical to the success of pharmaceutical companies to distribute medicine to suppliers and customers efficiently. The problem discussed in this study was that Indian healthcare businesses spend large amounts of money on SCM related factors and some Indian business leaders in the healthcare sector do not have the required knowledge to implement the necessary best practices to bring down the high costs of SCM. The purpose of this study was to find out what strategies some Indian business leaders have used in the Indian healthcare context to reduce high costs by asking the following overarching research question: What SCM strategies can Indian business leaders in the healthcare industry use to reduce the high costs associated with SCM?

In this section, I present the summary of findings from conducting semistructured qualitative interviews regarding the strategies that Indian business leaders in the healthcare industry use to reduce the high costs associated with SCM. The findings show

that Indian pharmaceutical companies face multiple distribution and logistics challenges and lack the use of best strategies in SCM to reduce their overall cost.

Presentation of the Findings

I analyzed the qualitative data from semistructured interviews conducted with three Indian business leaders in the pharmaceutical industry. The interviewees were Indian business leaders working in pharmaceutical companies, willing to answer questions about SCM strategies used to reduce the high costs associated with SCM.

The context of the data was qualitative research about the Indian pharmaceutical industry, the money spent on SCM, and any related factors. The overarching research question asked was as follows: What SCM strategies can Indian healthcare business owners use to reduce the high costs related to SCM? The focus of this study was supported by eight interview questions, as participants' answers to these questions helped to answer the overarching research question. The main inferences were what makes SCM costs high in India and what strategies existed to help mitigate these costs.

I used the purposive sampling technique to select the study participants to answer the interview questions. Choosing this method of sampling ensured that the small number of cases yielded the right amount of information about SCM strategies. The target population included business leaders, managers, and professionals performing the same function for at least two years and working in pharmaceutical companies in India. The first set of interviews captured the necessary detailed data for coding and analysis.

I conducted the interviews using Skype and recorded each interview. I later transcribed participants' recorded answers for analysis and checked these for accuracy by making them available to each interviewee. Each interview took about 30 minutes to conduct and the consistency and nature of the questions provided the necessary information and adequate responses needed for the study. I chose a Skype interview as the method for data collection because it offered the ability to reach and observe the best and most relevant participants. This was important for the study because these business leaders resided overseas. Potential data loss by missing social and nonverbal cues, often missed in standard telephone interviews, was mitigated by the use of Skype (Hancock & Algozzine, 2011; Rohde et al., 2014; White et al., 2014). In addition, I received the companies' best practices and processes documentation from the participants. These three sources of data allowed me to perform data triangulation during data analysis.

I maintained the anonymity of participants by assigning the coded sequential representation of the participants' name (e.g., 'respondent 1') on the copy of the consent form and applying fictitious names to any discussed people. I did not share any identifiable data anywhere in the analysis and write-up. I am the only individual with access to the participants' personal information and I kept the information safe in a password-protected computer and locked cabinet. All data were stored according to the correct procedures and will be destroyed after five years, according to University requirements. I also adhered to the basic code of conduct, as planned and outlined by the Belmont Report (Cugini, 2015).

I downloaded the transcripts into NVivo 10.0 and completed a preliminary word frequency search in the program. I have limited the frequency to the 25 most frequently used words in the three coded interviews with a minimum length of at least five characters. Table 1 below displays the top words, length, count, and the weighted percentage in each of the interviews.

Table 1

Preliminary Word Frequency

Word	Length	Count	%
interviewer	11	59	2.08
interviewee	11	58	2.04
distribution	12	48	1.69
challenges	10	44	1.55
thank	5	43	1.51
organization	12	36	1.27
medicine	8	35	1.23
market	6	31	1.09
India	5	30	1.06
process	7	23	0.81
company	7	21	0.74
challenge	9	20	0.70
think	5	18	0.63
another	7	16	0.56

different	9	16	0.56
supply chain	5	15	0.53
contingency	11	15	0.53
definitely	10	15	0.53
demand	6	14	0.49
transportation	14	14	0.49
based	5	13	0.46
global	6	13	0.46
infrastructure	14	13	0.46
question	8	13	0.46
supply	6	13	0.46

Table 1. *Revealed the top words, length, count, and the weighted percentage in each of the interviews*

The initial step began with categorizing and building up the inferences with the data. This first step offered the best way for starting the coding and comparing data during each phase of the analysis. After completing the initial word frequency, I reviewed the linked statements in the interviews for any relevant data. I have eliminated the top two words from the list because these included the words *interviewer* and *interviewee*. These words held no relevance to the analysis, as they were only part of the transcripts. I used my best judgment to narrow down the list and incorporate words with a reference count of 20 or higher to include in the first level analysis. A scan of the other words with fewer references showed inclusion with several of the top words listed in the frequency;

the assumption was that these words would be included in the nodes created from the top words. The top words were *distribution, challenges, organization, medicine, market, India, process, company,* and *challenge*. From these top words, I have decided upon the most relevant ones from the list, which included *challenges, market, organizations,* and *process*. I then created the preliminary nodes (i.e., categories) in NVivo 10.0 and found patterns and themes in the interview data.

The next coding step involved creating individual nodes for the interview questions. The interview questions included the following:

1. What is the process of medicine distribution in India?
2. What are the factors that contribute to the challenges of distributing medicine in India?
3. What are logistic challenges encountered in distributing medicines in India?
4. What is the impact of distribution disruptions and logistic challenges to the healthcare companies in India?
5. Do you think business leaders are spending considerable money in SCM related factors? Why or why not?
6. How can the SCM process reduce the costs of medicine in India?
7. What type of SCM practices are in place for distributing medicines in India?
8. What are the primary logistical challenges faced by medicine distributors in India? Such as long distance travel of the medicines?

I used the interview question nodes for comparison with the coding created by the word frequency. A comparison of this information led to the second level of coding and organization of the coded interviews into three themes, including (1) distribution and logistics challenges, (2) impact of SCM processes, and (3) best practices and solutions. Figures 3-6 shown below depict the coding by item and the percentage of coverage within each interview.

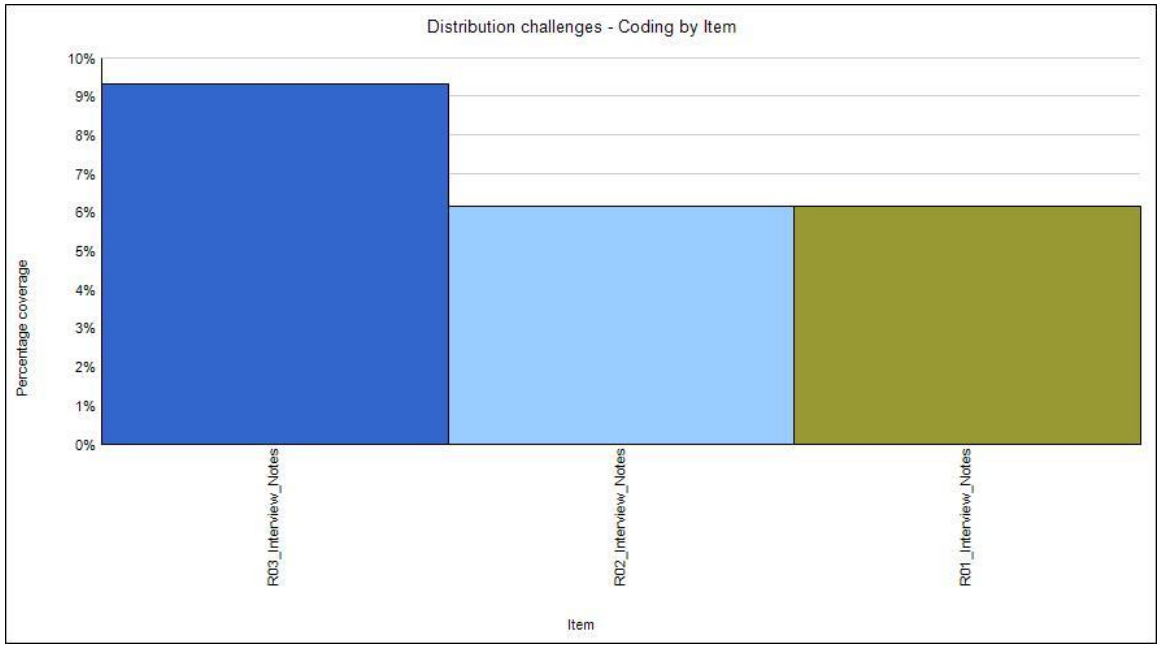

Figure 3. *Distribution challenges - coding by item*

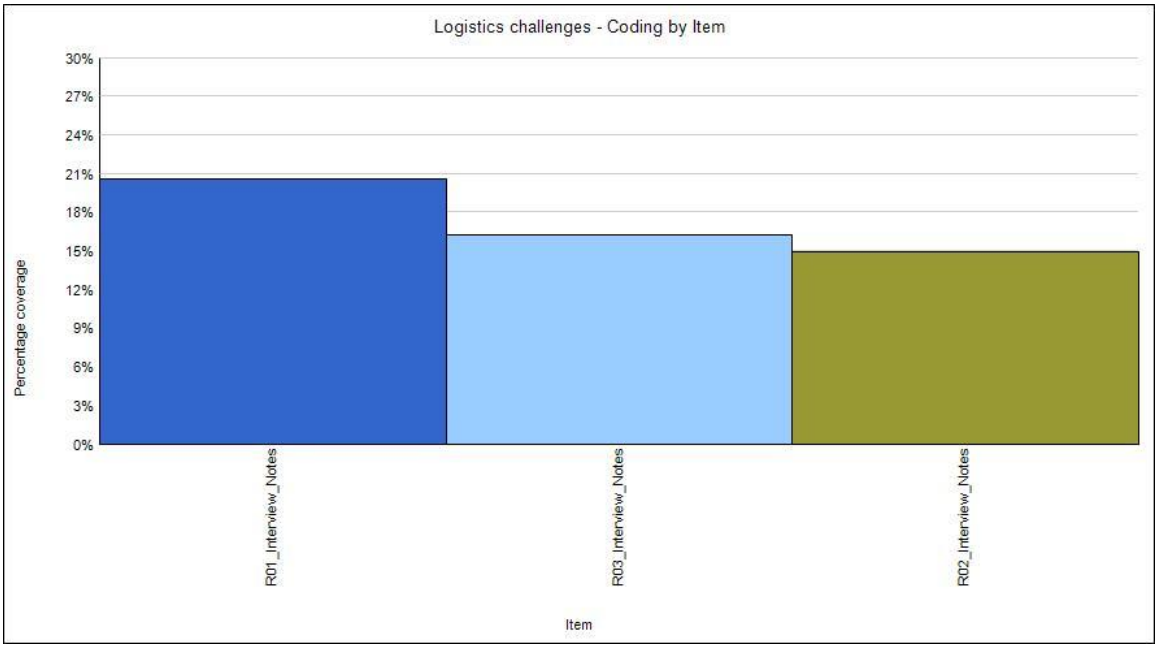

Figure 4. *Logistics challenges - coding by item*

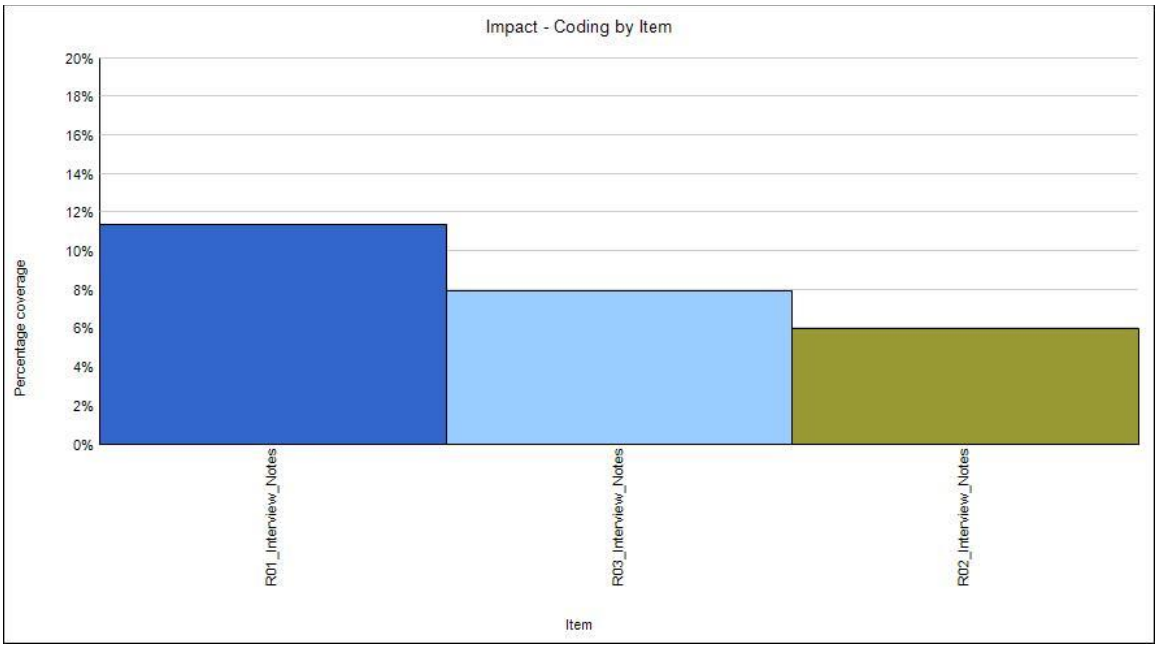

Figure 5. *Impact - coding by item*

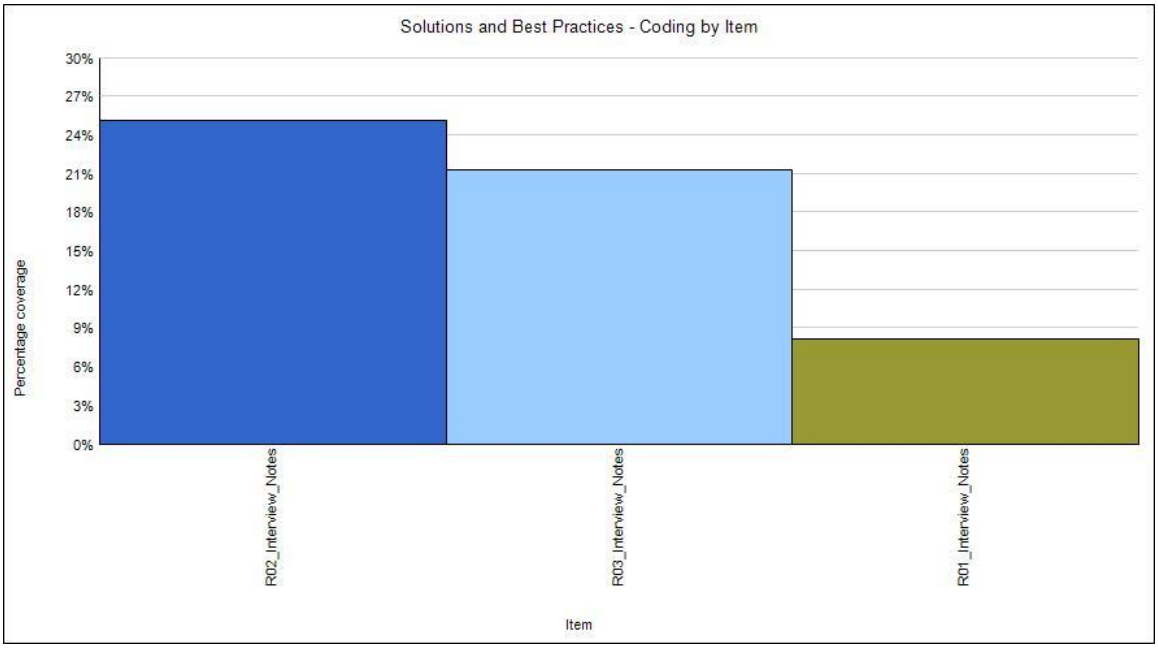

Figure 6. *Solutions and best practices - coding by item*

These themes emerged from cross-referencing the interview data and are all related to the organizational performance of healthcare companies. The themes revealed information that assisted me in answering the overarching research question of this study.

I compared these themes with the literature on the subject and the TOC (Goldratt, 1990), which is the conceptual framework I selected for this study. The narratives showed the overlap between all three interviewees' responses. The narrative noted, with a specific citation, whenever distinctions existed in opinion or whenever direct quotations or paraphrases came from an interviewee. The narrative denoted these distinctions with the categorization of R01, R02, or R03.

Theme 1: Distribution and Logistics Challenges

Distribution and logistics challenges in the supply chain system create a serious problem for healthcare companies attempting to supply medications. All three interviewees noted that these challenges center on the split nature of the supply chain system. Figures 3 and 4 above reveal the percentage of coverage within each interview related to the distribution and logistics challenges. Respondent 1 indicated that the main factors or challenges for distribution of medicine in India are due to the highly fragmented nature of the distribution network in the developing countries and, secondly, to the different requirements for the transportation of drugs, such as a cold chain and augment system.

Each product has its own transportation needs. This finding concurs with the literature on the changes experienced in pharmaceutical supply chains over the past several years (Kelle et al., 2012). Each interviewee also noted that fragmentation and an overall distribution problem exists in developing countries for special transportation requirements of the medicine within the supply chain network. Supply chains in both developing and developed countries vary in regards to function, financing, and performance (Choi et al., 2012).

This fact means that each step in the distribution and logistics process includes a different player and requirement, creating additional problems because medications all have their own transportation needs. The *cold chain* is a system of transporting and storing medicine within a recommended temperature range. This cold chain and the supplement systems need adjustment for each one of those products. Respondent 2 stated

that every product manufactured requires various transportation parameters, such as temperature and storage conditions, which represent major challenges faced by Indian pharmaceutical leaders. Not every company was even aware of the transportation requirements, which led to waste.

Each interviewee also described companies as different and complex in size and needs. The company's size contributed to the difficulty and/or the effectiveness of the distribution throughout a network. "There are several challenges based on the organization's distribution size, especially related to distributing medicine in rural areas" (R02). As noted, that was particularly true within the context of distribution to rural areas, which is a significant factor throughout India. Typically, supply chains in developing countries demonstrate serious weaknesses and difficulty in alignment because of area conditions (Zhu et al., 2012).

> Unlike in developed countries, we have a lot of infrastructural and communication challenges in India." Demand comes from various avenues and to meet this demand promptly, especially in the rural areas, is a challenge. For example, in cold chain requirements, infrastructure is not adequate to support the needs. Another dimension is tax laws. We need to pay the intra-state transfer sales tax, which is costing the company. Therefore, we have to invest in local distribution networks and maintain them, which is another cost/challenge. It is even harder for smaller companies not being able to afford the maintenance of these conditions, as they are a tall order on their capital cost. (R01)

Each interviewee reiterated this problem in the discussion regarding how rural conditions and complexities within different areas of India affect medicine distribution throughout the country. These conditions varied from climate conditions to company authority and connected back to other problems associated with the conditions where the medicine is transported and stored.

The most frequently mentioned challenges to both distribution and logistics were transportation, infrastructure, and communication at each level of the supply chain. This chain is outlined in Figure 7 below.

Figure 7. *Supply chain outline*

Supply begins the SCM process and goes through procurement, production, storage, and distribution, stopping with the consumer and ending with the end user of the products. These challenges actually play a part at each stage, not just with distribution. According to Gjerdrum et al. (2012), the standard approach for testing the efficiency of the supply chain distribution involves looking at all of its physical and business processes. The interviewees revealed the difficulties facing most healthcare companies in India because these processes showed flaws. This means that the basic reliability of the entire supply chain remains in flux, posing an incredible risk and high cost of distributing medicine to the market.

Communication was a key issue at every stage of the SCM process, as poor communication throughout the supply chain posed a serious risk, especially during logistics and distribution. Communication becomes a major issue, particularly when the medication left at the distribution center and transported by the moving company, did not fall under the company's control (R03).

> Regarding communication once the drug leaves the facility to a fleet, there is no way through which we can gain any kind of control over that fleet; so, we don't know where the drug is at any point in time. There's no way to track it. So, from a communication perspective, that's a tremendous challenge for us. (R03)

Respondent 3 indicated that the company's leaders are unable to track the drug shipment and, therefore, they cannot control shipment and delivery problems. This finding links back to the discussion about other SCM challenges including overall storage and transportation. Transportation is the most crucial aspect of the supply chain process for both distribution and logistics, as determined by other researchers (Tsao & Lu, 2012). Each participant noted that medication required specifically controlled temperatures and conditions for shipment purposes. Medicine needs to be shipped by a particular temperature controlled transportation, which leads to additional layers of complication for distribution.

Complications emerged when communication was difficult or absent. Companies needed reliable transportation partners able to understand the distribution challenges and needs of the product. This is the reason communication was such an important factor in

the whole process and it remained an ongoing problem for product distribution throughout India.

Logistics challenges existed within the distribution problems and interview data revealed contingency planning (e.g., optimum inventory levels), risk mitigation, global expansion, fleet management, and communication as ongoing considerations. All the interviewees noted that the problems with distributions and disruptions affected the healthcare companies negatively. When medications are not distributed correctly or in a timely manner, patients suffer and companies bear the burden of financial loss (Uthayakumar & Priyan, 2013). These difficulties showed perpetuation because companies worked within a constantly changing market, especially in India, as companies must plan for emerging markets and new opportunities for distribution.

Interviewees noted that new opportunities introduced new problems requiring proper handling to meet the demand and the need for risk reduction. Contingency planning showed a fundamental necessity, as companies must have medication always on hand to meet the needs of the existing market. Inventory management was a problem for every company because each one must understand the optimum level of materials required to produce finished goods for the market.

Uthayakumar and Priyan (2013) noted that without the right amount of medicine in stock or not distributed promptly led to waste. All the interviewees reiterated that stock must always be on hand, but only the right amount. Too much product means a reduction in capital if supply outweighs demand. The requirement for each company varies on its

own optimum level and the market size. Respondent 3 indicated that each company builds a contingency plan for the optimum levels and, for a company in India, they maintain 30% on hand, depending on the manager's decision.

While careful contingency planning was necessary to meet the demand, poor logistics either helped or harmed the stock. The interviewees brought up the issue of reliable transportation again, as it was considered necessary for keeping stocks refreshed and at optimum levels in distribution centers. This finding is also connected to distribution challenges because India has over 30 states with varied climates, conditions, and governmental regulations that needed handling.

Bhattacharya et al. (2014) reiterated the importance of the logistics supply chain and the control of the flow of goods to meet consumer demand. The interviewees echoed this importance when noting that a missing link in the supply chain meant problems for distribution. The challenge of logistics meant that without quality processes in place, companies had to delay fulfillments in the absence of effective communication between distributors and their fleet operators. Each interviewee discussed the requirement that companies need to invest in improving their SCM capabilities and the overall process to mitigate contingency issues and negotiate the right levels of procurement with partners. Ramanathan (2012) noted that contingency planning required careful consideration, as most companies have a particular stock made to order and delays in procurement occurred when companies did not account for the necessary stock levels.

Procurement and the logistics of moving medicine included dealing with existing regulatory mechanisms. Different laws in India determine the movement and selling of medicine throughout the country and present challenges for SCM (Rohit et al., 2012). The government controls the price of drugs and the national government employs a number of policies regarding drug prices for various types of medication (Berndt & Cockburn, 2014).

All of the interviewers touched upon this issue, noting that companies must deal with government policies, including intrastate taxes for transferring and distributing the products. Costs for taxation and movement end up being the financial responsibility of the companies that need to build these costs into the overall cost structure of SCM. All interviewees indicated that some of the Indian healthcare companies are investing in local infrastructure and networks to reduce these costs. Berndt and Cockburn (2014) argued that much of the necessary equipment and human resources for manufacturing existed locally. This finding matched this study's finding about reducing costs by trying out this type of investment. However, finding and maintaining these connections represents an additional and unique challenge.

Each of the interviewees stated that global markets for medication continue rising in India and contribute to the logistics and distribution challenges. Respondent 1 reported that global expansion is another challenge. While the global market provided an outlet for new markets and potential revenue, growth required companies to spend more on SCM processes for improved logistics quality. Distribution disruptions and stock shortages

occur regularly. These problems relate to coordination and communication at each point in the supply chain. Companies' leaders learned to deal with the challenges, as some of them were more common than others, so companies' leaders work to mitigate the risks represented by each challenge.

Furthermore, challenges related to contingency planning and maintaining stock reserves at optimum levels need to be addressed to overcome disruptions and ensure stock remained available at distribution centers, both locally and globally. This was particularly important for companies distributing products in the market at all levels. Each interviewee claimed that challenges linked to unreliable transportation and unstable infrastructure remains constant.

The geographic location and diversity within the country create multiple unique challenges for each healthcare company. The participants pointed out that logistics and distribution must be connected components to obtain the successful release of medicine. These challenges also relate to the supply chain aspect of fleet management. The rise in pharmaceutical space around India and the opening of new pharmacies also create another aspect of the market where fleets distribute the medicine to new areas open for business. New fleets mean new partners, but a company needs to find reliable partners to transport the medicine. Some companies found successful partnerships and helped identify partners, depending on the geographic location.

Theme 2: Impact of SCM Processes

According to the study participants, the most notable SCM challenge is related to the logistics and distribution of medicine to the overall market. Each company uses similar methods to overcome these challenges, including distribution problems, stock shortages, and disruptions in the delivery at the local level. Figure 5 above displays the percentage of coverage within each interview related to the impact of SCM processes.

Companies planned for any new growth, but they needed to cater to the existing market at the same time. This issue requires companies to be ready with those strategies, outlined by the distribution and logistics challenges; including contingency planning, risk mitigation planning, and ensuring medicine remained available to meet the demand for expansion into new and existing markets.

Qiang and Nagurney (2012) supported these ideas by noting that any number of issues ranging from customs inspections to lack of capacity in the transportation network impacted companies. Bueno-Solano & Cedillo-Campos (2014) also pointed out that supply chain issues include lack of stock, production problems, and delivery of products to consumers. This study's participants discussed the challenges of logistics and distribution, which included inadequate processes and increased capital spending on improvements. These challenges led to poor communication and fulfillment delays for medicine.

Respondent 1 stated that "many fulfillments are getting delayed due to the lack of effective communication. By investing in improving our capabilities, we not only reduce the costs but also enhance the quality of the overall process." The emergence of new

markets also influences the cost of medicine on the market, representing either a burden or a source of new revenue. Companies had to make sure that they improve their processes sufficiently well to meet the new demand. It also meant companies had to invest and secure needed capital to meet the evolving market needs. The biggest impact from these challenges is that more money needs to be invested in SCM processes and related factors.

Deshpande (2012) noted that companies reached better organizational performance levels when they achieved projected organizational and financial goals. Companies need to invest in new markets while continuously serving the current market needs. The minimum stock is necessary for every pharmacy and retail store on the market to ensure medicine availability. Respondent 3 claimed that "when it comes to existing markets, we need to make sure that we have the minimum stock availability for every pharmacy or every retail store." This means that pharmaceutical leaders must first overcome the logistics and distribution challenges to meet that demand. The right contingency plans are critical to ensuring the availability of medicine. As a result, the impact that entering the new market has on business organizations is highly difficult to handle because it is challenging to maintain the existing stock of the current market, which also raises the contingency numbers. Not having decent infrastructure or communication companies would lose revenue and a share of the market.

Theme 3: Solutions and Best Practices for SCM

Barney (2012) suggested that an organization gains a competitive advantage when it creates a firm position for itself within the market and one that differentiates itself from the competition. Goldratt's (1990) TOC served as a framework for the responses of the three interviewees, providing similar best practices for reducing company costs and increasing capabilities. TOC offers three areas covering logistics, performance measurement, and logical thought (Cox & Spencer, 1997). This framework is useful to business managers to understand the kinds of things that keep a company from achieving best practice goals and to identify any problems. The point of the TOC is to help companies' leaders find the best ways to maximize their performance and to evaluate organizational performance based upon goods, inventory, and operating expenses (Gupta & Anderson, 2012).

From this study's participant responses, best practices emerged, covering the continued or increased investment in building up a good SCM structure and processes, introducing cost saving measures, implementing forecasting models and watching the market for changes, and encouraging movement into new markets but spending the necessary capital for improving and modernizing the whole system. Enhancements to the supply chain process occurred when companies introduced cost saving measures through automation and improved communication. These improvements are important factors for reducing waste and unnecessary inventory. An identified need emerged to create partnerships locally, regionally, and globally to build trust and to keep medicine costs down.

Goldratt's (1990) TOC noted that performance improves when organizations find ways to improve productivity while keeping operational and inventory expenses in check. Participants repeated the claim that existing best practice for SCM includes the rolling forecast models for emerging and existing markets. Forecast models exist when a company uses baseline data to calculate future product demand. Acar and Gardner (2012) described forecast models as the means of reducing uncertainty in areas of distribution and logistics planning for SCM. Stock and Watson (2012) noted that forecasting methods include several categories for forecasting, requiring forecaster's personal judgment and quantitative data. The participants said that such models need constant refinement to keep the system up-to-date and to make projections for the appropriate market conditions. Improving technology, building infrastructure, and applying updated forecasting models are necessary to reduce the overall supply chain cost. This finding was similar to the improvement of efficiency processes made achievable by the TOC methodology. Efficiency is perhaps the most important best practice a company can achieve (Rhee et al., 2010).

The company's size and market determine the forecast and constant refinement of the forecasting models is a necessary best practice. This finding is consistent with the work of Stock and Watson (2012), as they argued that forecasting methods have to be different depending upon the product and company context. Bazzani and Canavari (2013) also noted that external factors influenced market size and demand, including demographics. The interviewees reiterated these points by saying that sources of demand

mattered. Respondent 2 claimed that demand sources include governmental organizations and public and private firms. The important factor is to ensure that the company's model fits its size and that it remains consistent. Graefe et al. (2014) showed that combining forecasting models and methods are reduced error. The participants also confirmed that multiple types of models are required to distribute the medicines, and constant refinement is necessary to accommodate the market conditions.

In addition to the forecasting models, companies' leaders also use replenishment tactics to address the contingency planning. Efficient SCM process reduces the cost of medicine, by building infrastructure capabilities, managing the cold chain supply, engaging in market forecasting, and improving product contingency measures. Such tactics regulate expired drugs, reduce waste products, and ensure patients received the medicine on time. Waste management is a critical component of an organization because excess products are a drain on the company revenue. Haq and Boddu (2015) noted that while collaborative planning needs the support of tools and multisite planning, it depends on proper coordination and good management.

Study participants claimed that good management requires having the right trading partner to source the raw materials and to destroy timely expired products for reducing the overall costs. Nagurney et al. (2013) showed that a good management system within the SCM process provides optimal product flow and improved efficiency. This finding matched the interviewees' opinions that the entire SCM process, from the supplier to the end user, is required for best practices and problem solutions. Efficient

SCM improves the overall operational efficiency of a company by capturing new markets quickly and expanding the company's profit margin. All the study participants noted that the correct forecasting models and efficient SCM processes might make the difference in organizational negotiations and cost savings for a healthcare company.

Another area of improvement in best practices is in process management. Study participants claimed that many organizations are running the manual process for procurement and administration functions. Simatupang et al. (2004) noted that when using the TOC method, organizations can overcome the challenges associated with collaboration and replenishment policies. Working together to establish better process management and communication improvement advances the profitability of an organization (Simatupang et al., 2004). Building relationships and securing appropriate trading partners in new markets is an essential requirement for a company.

Transportation and infrastructure continually appeared as key components of the best practices given by study participants. Chan & Zhang (2011) reported that transportation is the connecting point between all aspects of the supply chain. Participants voiced that companies need a strong infrastructure to thrive in a changing market and, having their own transportation fleets or a reliable partner to make on time deliveries, ensures product availability all the time. Respondent 2 claimed that by owning the transportation capabilities, an organization can overcome the on-time delivery challenges associated with medicine distribution to the customers.

Indian business leaders in the healthcare industry spend money to improve the process and solve SCM issues. This practice of spending money to improve the SCM process is a change from previous decades (Christopher & Holweg, 2011). However, the previous system changed because companies needed better strategies to support their long-term transportation needs and to handle their transportation costs in SCM (Prajogo & Olhager, 2012).

Most organizations are spending money on transportation because it improves the system and increases revenue. Respondent 3 stated that approximately 30% of the business organization's revenue is placed back into supply chain improvements. Best practices always include being ready to evolve as the market continually changes. Forecasting is required, because what happened a few years ago is no longer relevant. Also, it is necessary to look at the overall supply chain process and find areas for improvement. Respondents commented that companies always had to be on the lookout for new markets and partners for trade.

TOC provides a useful basis for this study because it encourages business managers in the healthcare industry to identify challenges associated with SCM strategies and to find solutions to improve efficiency. The interviewees considered that replenishment and forecasting models are important parts of managing both, existing and new markets. Forecasting and replenishment methods are industry standards for the majority of healthcare companies. However, there was an outlier in one of the interviews regarding forecasting. Study respondent 3 indicated that Indian business leaders are

considering the e-commerce business as a new method for distributing the medicines. Also, respondent 3 claimed that e-commerce infrastructure enables the supply chain partners to share data quickly and to build trust and visibility. While traditional models are excellent, the e-commerce model helps to change and improve the market by lowering costs and improving effectiveness that translates into revenue for a company.

Companies need to spend money to make necessary changes and improve processes. Respondent 2 stated that to stay ahead of the market demand and to reduce the long term operational costs, Indian business leaders in the healthcare industry spend more money on SCM processes. Organizations investing money in making improvements to their SCM processes have experienced better financial outcomes. Companies have even shifted away from offshoring certain parts of the supply chain process to near-shoring, as a means for reducing costs (Ellram et al., 2013). This action was part of the overall solution given by this study participants to finding resources closer to home to help cut expenses in the market. Essentially, a company reduces operating costs and increases revenue by uncovering and satisfying unmet needs in the market. Investing and constantly refining the SCM processes are the main components of best practices and solutions to SCM process problems.

Applications to Professional Practice

Adhikary and Bora (2014) pointed out that SCM costs in India are incredibly high in comparison to other parts of the world and they account for 13% of the country's GDP. These high costs associated with SCM make the findings from this study applicable to

professional practice in the healthcare business. Supply chain managers in healthcare companies can apply the best-practice results from this study to create and deliver better services in SCM. Improved services will increase the company's reliability, product availability, and delivery of the right products for existing and emerging markets. These findings include the continued or increased investment in building up a better SCM structure and the introduction of cost-saving measures, such as contingency planning and risk mitigation. Also, the findings from this study may assist companies' leaders in implementing the right forecasting models, encourage movement into new markets, and spend the necessary capital for improving and modernizing the whole SCM system. Using the right tools presented by these findings provides improved visibility on company performance, helps improve costs, and decreases supply disruptions.

This study's findings show that challenges to logistics and distribution continue to rise in India. Global market demands are increasing within the Indian healthcare industry, as demand for products increases. The interviewees also reiterated that companies need to invest in improving the SCM process to meet the existing and emerging market needs. That means both coordination and communication have to improve and must address these issues at every point in the supply chain. Disruptions and shortages are common, but the experiences noted in the findings apply directly to how healthcare companies can improve the quality of their distribution and logistics. Healthcare organizations should be investing in the improvement process by using the proven strategies for contingency planning and risk mitigation.

Supply chain failures occur all across the supply chain model in different ways. It is critical that Indian business leaders in the SCM area select the right strategy to reduce risk. They should use the most practical approach presented to meet the numerous disruptions taking place in a particular market. Implementing the information from this finding can minimize the risks, increase effectiveness, and maximize the allocation of resources. This is particularly important because of the geographic diversity of India which creates unique challenges for each healthcare company.

Goldratt's (1990) TOC provided a useful basis for this study because it encourages business managers in the healthcare industry to identify challenges associated with SCM strategies and to find solutions to overcome this hindrance. As suggested by Goldratt and Cox (1990), companies should focus on identifying constraints and understanding how to explore the identified constraints to return to usual practices. The findings from this study suggest that companies will see efficiency by implementing the best practices to improve the overall SCM model. Efficiency is the most important aspect a business can achieve (Rhee et al., 2010).

Companies' leaders need to understand their entire supply chain and to implement collaboration among distribution partners to take advantage of its benefits (Saberi et al., 2012). Any lack of awareness about the supply chain process holds a business back. For a healthcare company to be competitive in the Indian and the global market, it must adopt the right strategies to respond quickly and efficiently to the supply chain disruptions (Simatupang et al., 2004).

Implications for Social Change

In terms of social change, this study is significant because its findings may assist the Indian healthcare companies and those working in the field of medicine distribution, in making the essential medicine available to the consumers without disruption. This study's results may impact the availability of medicine to the end users in the healthcare market both in the Indian and the global markets. India offers low-cost drugs to its citizens and other patients from around the world (Berndt & Cockburn, 2014). Using the information from these findings may help companies's leaders build plans to address weaknesses in the supply chain and to ensure that products reach consumers on time.

Kelle et al. (2012) noted that the pharmaceutical industry has undergone numerous changes over the years and it has developed a new role in the business industry. Supply chain managers should work with other supply chain partners to minimize the disruptions in the supply chain, thereby ensuring essential medicines will continue to move through the supply chain processes and, ultimately, reach the end consumer. The findings from this study could provide a basis for supply chain managers to develop and implement supply chain disruption strategies that could minimize the negative effects disruptions have on their organization's profitability and performance.

Managers have the opportunity to minimize unfavorable outcomes and supply chain disruptions by implementing best practices and strategizing them carefully. Improvements in healthcare industry SCM processes mean overall improvements to an individual's personal health, the public health, economic health, and social well-being of

people. The implications for positive social change include the potential of reducing supply chain risk, which could lead to lower prices of products for consumers, increased stakeholder satisfaction, and a higher standard of living.

Recommendations for Action

The findings from this study indicate that medicine distribution problems build upon one another. Logistics and distribution challenges include forecasting and gaps in the communication during the transportation. Business leaders need to consider every aspect of the SCM process to realize its benefits. Developing a standard approach to modeling and forecasting a company's needs is critical to that organization because it helps to incorporate all aspects of the SCM processes, including product development, transportation, and storage (Gjerdrum et al., 2012).

Forecasting models vary, depending on the size of the business organization and the market it serves. Interviewees noted that Indian healthcare companies are operating in a fragmented market system. External factors constantly change the market's size and shape, requiring consideration when making projections about product needs and distribution (Bazzani & Canavari, 2013). Companies continuously refine the process by implementing new technologies as these become available. Forecasting methods are excellent ways to strengthen business processes without being invasive to the supply chain process (Gjerdrum et al., 2012).

According to Stock and Watson (2012), multiple methods exist for forecasting depending on the product, company size, and the environment. The morbidity-based

forecasting method allows the companies or products to forecast without prior data (Vivas-Consuelo et al., 2014). Adjusted consumption-based forecasting is another method used when no reliable data is available (Vivas-Consuelo et al., 2014). Interviewees indicated that the combination of two forecasting methods offers a best possible solution for healthcare companies in India.

The purpose of forecasting is to find potential business demand to ensure managers can make accurate decisions about pricing, business growth, and market potential (Acar & Gardner, 2012). Companies should build upon efficient SCM processes, such as replenishment and forecasting, because it reduces the product cost and excess inventory and improves contingency measures. According to Haq and Boddu (2015), companies can improve the operational cost through collaborating in the supply chain process and by reducing the supply cycle time.

Interviewees indicated that organizations need to consider improvements in the supply chain process management. Several Indian healthcare companies are using a manual process for logistics and procurement tasks. Although the traditional models do work for some companies, the manual process is expensive and prone to error. Respondent 3 stated that e-commerce is a management process that improves trust and allows sharing data instantly among partners in the supply chain. The e-commerce model fosters activity in the market, reduces operational cost, and helps to build upon other best practices.

Applying best practices to a company's SCM process contributes to overcoming supply-partners collaboration problems and increases profitability (Simatupang et al., 2004). A company's efficiency improves when organizations adopt shifting strategies away from expensive transport supply chain strategies to efficient designs for transportation (Khan et al., 2012). Companies should consider efficiency regarding their products, including when, where, and how to store them properly. Transportation may be an essential part of the supply strategy, as it connects each part of the network in the supply chain system (Buyukkuaramikli, 2014).

Organizations need to move beyond their inner walls and implement new collaborative strategies and process improvements to reduce costs for their companies and to the consumers (Ellegood, 2014). Companies should also consider refining storage and warehousing strategies as part of SCM best practices. Implementing a movement towards a consolidated warehouse provides improved transport services for an organization and logistics management (Hofmann & Lampe, 2013). Overall, the healthcare companies require spending capital on technologies and best practices to improve processes. The findings from this study support these recommendations from the literature, as Respondent 2 claimed that the market demand requires companies to have efficient forecasting models and capabilities to meet product levels, as this is the only way to stay ahead in the rapidly changing market.

The findings from this study could apply to all healthcare companies across all aspects of the SCM. Managers and business leaders in the field of medicine distribution

and pharmaceuticals may benefit from the findings of this study. Organizational performance is needed for companies to achieve their financial goals (Deshpande, 2012). The findings from this study demonstrate that while the challenges represented by supply chain problems and business performance are linked investment in best practices that work within the Indian context are required. At present, managers and business leaders in the healthcare industry share the essential information through professional networks.

The results of this study also contribute to supply chain discussions regarding investment strategies and the SCM best practices for process improvements. Educating companies on supply chain policies in the healthcare industry can influence other organizations to apply necessary changes. Publishing the study in an approved research database also provides access to researchers, students, and others interested SCM professionals. Study participants will receive a copy of the summary and findings, which will also add to dissemination efforts. Finally, I will publish this study's findings in a peer-reviewed journal and find opportunities to present the information at seminars and conferences.

Recommendations for Further Study

This study provides the foundation for future research into understanding the best strategies for managing supply chains. Future research can deepen the understanding of issues facing Indian pharmaceutical companies and global healthcare companies. This study's findings show the relationships, strategies, and best practices employed by managers and companies to mitigate medicine supply disruptions. An expansion of the

case study to include the perspectives of other business leaders in India, and outside of India, would serve to broaden the transferability of the research to other markets.

Limitations are potential shortcomings of the study that are typically out of the researcher's control (Marshall & Rossman, 2011). This study has limitations, as it only refers to SCM strategy issues within India, although some of the information does have applicability to all healthcare markets. In terms of recommendations for future research, researchers should analyze the individual pieces of the overall SCM system and identify optimal strategies for eliminating weaknesses within each part of the process. This study's sample provided rich information on the best practices employed by Indian business leaders; however, the data are limited to their experiences and perspectives. Including a broader group of participants from various organizations is highly recommended.

It is beneficial to see the way companies use different forecasting methods and confirm which ones do provide the best possible results for companies to adopt. Researchers should also look into outcomes-related process changes and technologies implemented within the healthcare industry to understand the manner these changes contribute to the improvement of the supply chain process.

While this study offers a fresh perspective on current SCM strategies that indian business leaders are using and provides recommendations for best practices, more research is needed to find additional practices to overcome supply chain problems. A lack of knowledge still exists about all of the best practices in SCM strategies and the best

way to implement these within the industry. The costs associated with all aspects of the healthcare industry's SCM require increased consideration to improve decision-making processes (Ellegood, 2014).

Reflections

The experience gained from this study allows me to recognize that numerous considerations for implementing best practices in SCM do exist. All of the problems discussed throughout the study are interconnected and is surprising when the data revealed that challenges to distribution and logistics overlapped in many areas. At first, it appeared to me as if the strategies focus on one supply chain area and, then, companies could see improvements on overall SCM. However, it became apparent that all aspects of the supply chain process need to be reviewed to have a robust discussion about effective SCM strategies.

I was unbiased and focused throughout the study on business issues detailed in the initial proposal. The three study participants were open to sharing their experiences and insights and the interview method was successful in gathering data that later became information. The interviewees provided an outstanding amount of data that assisted me in answering the overarching research question for this study.

Initially, I did indicate that a quantitative and mixed research approach would not be viable for this study and this claim still stands. However, the experience from conducting this study shows that a mixed methods approach would only enhance the results. The decision to use a purposive sample ended up being excellent because the

participants provided a substantial amount of information. Finally, I found it inspiring to listen to study participants recount their personal experiences. Moreover, it is personally a fulfilling experience to add new insights to the body of literature on this topic.

Summary and Study Conclusions

Data analyses confirmed previous assumptions detailed in this study about SCM strategies. The next step for furthering the implementation of best practices across the Indian healthcare sector is identifying how often the best practices are used and who still needs to learn about them in this industry. Companies that implement effective SCM processes may see significant improvements in their supply chain outcomes and efficiency arising for both the company and the consumer. The most important best practices include reducing challenges to the distribution and logistics, implementing the appropriate forecasting and replenishment techniques, and spending more on improving processes and collaboration. In conclusion, leaders of healthcare companies should continue using these strategies and expand them to reduce or eliminate weak areas of the supply chain process to reduce costs in SCM.

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Appendix A: Consent Forms

You are invited to take part in a research study that focus on exploring the perceptions and lived experiences of business leaders who have been successful in taking advantage of the best practices and SCM knowledge in India. You are chosen for this study because you are a business leader of an organization with overseeing the medicine distribution responsibilities. This form is part of a process called "informed consent" to allow you to understand this study before deciding whether to take part. This study is being conducted by Prasad Bolineni, who is a doctoral student at Walden University.

Background Information

The purpose of this study is to understand the best practices and successful strategies in place to reduce the costs associated with SCM.

Procedures

If you agree to be in this study, you will be asked to participate in a Skype interview each session lasting no more than 30 minutes

- Interview #1 will include a series of 8 open-ended questions
- Interview #2 (optional) will be a follow-up opportunity for you to provide any additional information you may have missed in interview #1

Voluntary Nature of the Study

This study is voluntary. Everyone will respect your decision of whether or not you choose to be in the study. No one will penalize you if you decide not to be in the study. If

you decide to join the study now, you can still change your mind later. You may stop at any time.

Risks and Benefits of Being in the Study

Being in this study would not pose a risk to your safety or well-being as the study focuses only on examining the lived experiences and perception of participants, and no confidential information will be discussed. The potential benefits of being in the study is your contribution to an enlighted view of strategies that business leaders use to reduce the organization SCM costs.

Payment

No payments / compensation will be given to any participants in the study.

Privacy

Any information you provide will be kept confidential. The researcher will not use your personal information for any purposes outside of this research project. In addition, the researcher will not include your name or anything else that could identify you in the study reports. Collected data will be secured in a locked cabinet, and I am the only person who will have access to this data. Data will be kept for at least five years, as required by the university.

Contacts and Questions

You may contact the researcher any time during and after the study execution via email prasad.bolineni@waldenu.edu for any questions pertaining this study. If you want to talk privately about your rights as a participant, you can contact Dr. Leilani Endicott

via email irb@waldenu.edu or 1-800-925-3368, ext. 312-1210, who is the Walden University representative for this study, can discuss with you. Walden University's approval number for this study is 11-10-15-0171351 and it expires on 09-Nov-2016. The researcher, Prasad Bolineni will give you a copy of this form to keep.

Statement of Consent

I have read the above information and I feel I understand the study well enough to make a decision about my involvement. By replying to this email with the words, "I consent", I understand that I am agreeing to the terms described above.

Appendix B: Invitation to Participate in Business Research Form

In-Depth Interviews - Invitation to Participate in Business Research

Greetings Mr. or Mrs. XXX,

I am a doctoral student at Walden University pursuing a Doctorate of Business Administration degree. You are invited to voluntarily take part in a research study that focuses on exploring the perceptions and lived experiences of business leaders who have been successful in taking advantage of the best practices and SCM knowledge in India. The purpose of this study is to understand the best practices and successful strategies in place to reduce the costs associated with SCM. The study conduct procedures include a series of semistructured interviews. Your name or any other information that could personally identify you will not be included in any reports of the study.

If you are interested in participating in the study, please refer to the attached 'informed consent' form. This document provides detailed information to help you understand the study conduct procedures and better assist you in your own personal decision whether to participate. Walden University's approval number for this study is 11-10-15-0171351 and it expires on 09-Nov-2016. After reviewing the attached consent form, if you are agreeable to participate in this research, please reply to this email with the words "I consent." By doing so, you are agreeing to participate voluntarily in the study. Please feel free to e-mail me if you have any questions or would like additional information. Please respond at your earliest convenience indicating your decision. I sincerely appreciate your time.

Appendix C: Interview Protocol Form

Project: Exploring the perception and lived experiences of the business leaders best practices and successful strategies in place to reduce the costs associated with SCM.

Date: _____ Time: _____Location: _____

Interviewer: _____ Interviewee: _____

Notes to interviewee:

1. The interview session will begin with greetings and introductions.
2. Remind the previously read and signed informed consent forms and thank for the participation in the study.
3. I will share the signed informed consent hard copy to the participant for their records.
4. I will turn on the audio recorder and note the date, time, and location.
5. I will indicate the coded sequential representation of the participant's name, e.g., 'respondent 1' on the audio recording, documented on my copy of the consent form and the interview will begin.
6. Each participant will be given the required time to fully answer each predetermined interview question in detail (including any additional follow-ups / probing questions).
7. At the close of the interview, I will thank each research participant for their time and participation in the study.