

Chapter 9

Phenomenological Study of Pharmaceutical Supply Chain in Pakistan: Innovative Approaches to Minimize Operational Inefficiencies



Sherbaz Khan, Syed Imran Zaman, Sharfuddin Ahmed Khan,
and M. Affan Badar

Abstract One of the major parts of the healthcare industry is the pharmaceutical sector. When we focus on the pharmaceutical supply chain, the process of delivering medicine is long in duration and has been characterized as more complicated in structure than other organizations. The objective of this study was to find issues associated with the supply chain of pharmaceutical firms in Pakistan, in addition; to what approaches can be used to minimize and eliminate the inefficiencies in the operations of the supply chain in pharmaceutical firms. The research followed a phenomenological method approach using explorative design. The research employed qualitative method using in-depth interviews. The study found that there are some major issues that act as significant operational inefficiencies in the context of Pakistan. Government regulations, product expertise, continuous forecasting, and technological advancement are major issues.

Keywords Pharmaceutical supply chain · Inefficiency · Healthcare industry · Innovative approaches · Phenomenological study · Pakistan · Government regulations · Technological advancement

S. Khan

Department of Supply Chain Management, Institute of Business Management, Karachi, Pakistan

S. Imran Zaman

School of Foreign Languages, Sichuan Tourism University, Chengdu, China

S. Ahmed Khan (✉)

Industrial System Engineering, University of Regina, Regina, Canada

e-mail: Sharfuddin.Khan@uregina.ca

M. Affan Badar

Bailey College of Engineering and Technology, Indiana State University, Terre Haute, USA

e-mail: M.Affan.Badar@indstate.edu

9.1 Introduction

Healthcare organizations should focus on everyone's health in their region by advancing in reachability service, and dependableness so every individual who requires medical care from the healthcare organization should receive a great experience (Chassin 2013). Human development and progress is a continuous process and every industry should excel in it including developing healthcare organizations, for that it requires continuous laying out capital for uninterrupted advancement to sustain its effectiveness in terms of operations and services (Khan et al. 2021a). In the US, many hospitals in rural areas have been closed due to financial reason (Kissi et al. 2021). At the same time, prices in healthcare are moving up at a high speed (Bhandari et al. 2020; Pondhe et al. 2006). To cut down prices, healthcare organizations have to achieve maximum efficiency in their operations and services (Mubarik et al. 2021). On the other hand, healthcare organization efforts are inconvenient when we note the differences with other sectors (Miao et al. 2022). The health sector is distinctly separate from other sectors because the malfunction of health services will affect society (Ferreira et al. 2018).

One of the major parts of the healthcare industry is the pharmaceutical sector. In spite of the fact that the pharmaceutical industry has made it possible for drug makers to bring forth new and more effective medicines, continuous research should be conducted (Miao et al. 2022). In the field of supply chain effectiveness to make the process better than before (Khan et al. 2021a). Widespread research should be conducted on matters that affect the supply chain of pharmaceuticals (Narayana-murthy et al. 2018). When we focus on the pharmaceutical supply chain, the process of delivering medicine is long in duration and has been qualified more complicated in structure than in other organizations (Birkie et al. 2017). The aim of this study is to provide more insight and practical information on the operational inefficiencies of the pharmaceutical supply chain used in Pakistan.

This chapter will contribute to the lack of attention to the whole network of the existing Pharmaceutical Supply Chain. Whole pharmaceutical supply chain systems need to be improved in terms of quality, visibility, speed, and cost to function effectively. First, this article will examine and investigate the pharmaceutical supply chain practices to identify factors that influence system inefficiencies, which is an important step in developing and improving the end product offering for the customer (patient). Secondly, it is necessary to understand strategies implemented in the pharmaceutical supply chain to identify innovative approaches that could be implemented to enhance the performance of pharmaceutical supply chain.

From the above discussion, objectives of this chapter are as follows:

1. Find the root cause of problems related to poor pharmaceutical supply chain performance.
2. Optimizing the practices implemented in the pharmaceutical supply chain.
3. Identify innovative approaches that can improve operational efficiencies in the pharmaceutical supply chain.

From the above objectives, we derive the following research questions.

An exploratory and qualitative approach was chosen and followed; these questions are formulated for the direction of our book chapter study methodology:

1. RQ1. What are the challenges associated with the whole process within the pharmaceutical supply chain in Pakistan?
2. RQ2. What innovative approaches can be implemented in pharmaceutical supply chain to make system more effective?

9.2 Theoretical Background

Research scholars have formulated detailed, clear and deep perceptions into the area of operational efficiency, providing useful and valuable definitions. It is accepted that operational efficiency is majorly affiliated to “Doing things with right steps” (Forsund 2017). Efficiencies in operations can be estimate by the final result of the procedure in direction of the five performance factors such as caliber, being flexible, fast (logistics), being dependent and charging cost (Birkie et al., 2017). Measurement of efficient process relies on the context of environment (Bamford et al. 2015; Khan et al. 2022b). Centering towards the process of producing services of healthcare, there is requirement to make healthcare efficiency better regarding service of quality, satisfaction and safety of patients and in costing (Guerrini et al. 2018; Khan et al. 2022c).

The greater force applied towards organizations of healthcare to reduce their spending on pharmaceutical converts and this is required immediately (Al-Balushi et al. 2014). Expecting to get the better of the restrictions of an organization that is function based (Mubarik et al. 2022). Adopting approaches that leads towards improvement are an essential part of healthcare organizations (Bam et al. 2017). Even so, mostly such approaches are uneven and methodologically restricted (Narayana-murthy et al. 2018). Some important problems are highlighted regarding low performance by the extant literature detailed review.

Even though the pharmaceutical supply chain objective is to secure demands of customers in effective manner, that means patients are able to receive medical products easily (Mubarik et al. 2022). It is portrayed as enterprise with complexities as it has to meet with aims with different conflicts and constraints that are not traceable (Bam et al. 2017; Arif et al. 2023). Multiple researchers have gone through the pharmaceutical supply chain, says that multiple elements are involved in inefficiency to the process (Bhakoo et al. 2012).

When different stakeholders are involved in pharmaceutical supply chain process, for example like physicians, management, suppliers, staff working in clinics, and pharmacists, than inefficiency increases in logistics of drugs (De Vries and Huijsman 2011, Zaman et al. 2023b). Everyone in the pharmaceutical supply chain are designated to different roles and have their own responsibilities and are responsible for their actions, so if the information is not shared accordingly it results in lower strength of flow of information between the departments (Bhakoo et al. 2012; Zaman et al. 2023a). Adding that physicians are the decision makers and if purchasing of

prescribed drugs are without brought into focus about extended knowledge of supply chain management SCM and operation management OM patterns then it will result into lower performance (Bhakoo et al. 2012). Breen and Xie (2015) focused towards the pharmacist's role that how well they explore their skills of critical management that is required to effectively perform. Davies and Edwards (2013) emphasized that the growth in constant manner of pharmacy sectors need to have more qualified pharmacist, if we not focus on the modules of management that lacks it result in under growth. Supply chain management skills are needed when pharmacist enhance their quality regarding service (Uthayakumar and Priyan 2013).

Pressures from regulatory and institutions causes issues in identifying exact forecast of sales with side to formulation of long cycles of the medical products of pharmaceutical causes difficulty if applying strategies of supply chain SCS (Bhakoo et al. 2012; Khan et al. 2021b). There is hard in foretelling the accurate demand for drugs, partially because of the standard nomenclature lack and partially because of the factual information that drugs are stored in multiple units of healthcare organization (Mustaffa and Potter 2009). Likewise, it is thought provoking to foretell the patient mix, apprehend their requirements and the supply intake (Scheller and Smeltzer 2006), and in sudden unforeseen interventions. This unexpected demand shows that it is the element that forces healthcare sectors to store high degree of safety stocks prevent the occurrence of uncertainties just like demand fluctuations in daily basis and bottleneck supply (Bhakoo et al. 2012). These patterns could rise the stage of wastage discovered in pharmaceutical supply chain, that means many expired or unnecessary drugs should have been disposed of, and that hits the potential level of environment and living health (Wang et al. 2015). Drugs are not cheap products and also can change over to harmful or unusable products for customers as they get closer to their expiry (Cherrett et al. 2012; Jiang et al. 2018).

An important issue, hence, dealing this industry is inefficiency in the process that is related to distribution of pharmaceutical (Miao et al. 2022). Robust logistics and systems with proper planning can eliminate inefficiencies in the existing system (Jamali et al. 2010; Khan et al. 2022a). It is known that standard distribution strategy systems can play vital role in instructing policies in other logistic sectors are not easily applied in pharmaceutical supply chain (Papalexi et al. 2015) because of the listed numbers in points of consumption, such factors like lengthy lead time, and extreme unexpected nature of when we talk about bio pharmaceutical manufacturing, which have made uncertainties (Bhakoo et al. 2012; Zaman et al. 2023b).

Figure 9.1 shows the structure of this complex supply chain, including the upstream, central, and downstream domains of the pharmaceutical supply chain that involve various stakeholder groups.

The pharmaceutical supply chain does not have single dimension and it involves various lines in distribution. For example, when we talk about the upstream area of pharmaceutical supply chain it only involves the pharmaceutical companies that manufacture the goods and this area can have middleman/distributor. The writer believes that the diagram plays an important aim in illustrating the complex pattern of real situation. Literature shows that lack of focus in involved in pharmaceutical supply chain in study (Narayana et al. 2014). Usually, scholars focuses on the

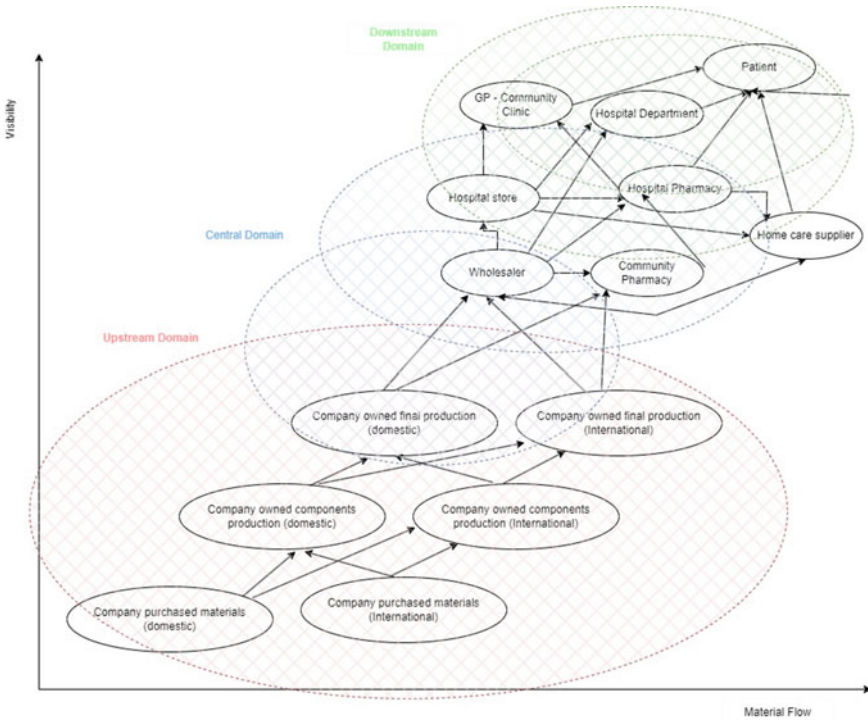


Fig. 9.1 Structure of the supply chain. *Source* Papalexi (2017)

processes of upstream business, that brings out rising interest in interactions between the Research & Development and pharmaceutical manufacturing in biotechnology sector (Sen et al. 2013). This study will contribute to the existing lack of focus on the pharmaceutical supply chain system as it investigates the pharmaceutical supply chain practices taking place in the Pakistan.

The above factors impact drug logistics and hinder improvement efforts. However, there is a wealth of research examining inefficiencies in pharmaceutical logistics (Bhakoo et al. 2012; Xie and Breen 2014). The focus of this study is to extend the existing literature by examining the pharmaceutical supply chain system in Pakistan. This will identify factors that affect the system by decreasing performance (in supply chain) applied in pharmaceutical companies of Pakistan. This study raises awareness of such factors that pharmaceutical companies in Pakistan can choose to avoid or take advantage.

9.3 Methodology

9.3.1 Context

Phenomenology approach was used, as we wanted to know the shared expressions of experienced managers in pharmaceutical companies (Khan et al. 2022c). Researcher conduct data from interviewee's by their enliven experience in pharmaceutical firms in Pakistan. The research was exploratory, as the issue has no clear answers in the context of Pakistan. Researcher conducted in-depth interviews with candidates in related fields. Researchers select samples that meet several criteria and answer the research questions to reach for aim and objectives of study (Matthews and Ross 2010; Ishizaka et al. 2023).

9.3.2 Development of Semi-structured Interviews

Semi-structured interviews are meetings in which the interviewer asks open-ended questions rather than following a rigid, formalized list of questions. The interview included a list of her three-part open-ended questions:

- (1) The first part relates to general questions about research phenomena and the role of respondents within them.
- (2) The second part contained questions specific to issues identified through review of the report and previous research, such as factors that impede effective supply chain processes.
- (3) Part 3 focused on respondents' personal views and beliefs about whether perceived issues related to system inefficiencies could be improved by implementing improvement approaches.

9.3.3 Qualitative Data Collection

Interviews were conducted from three managers of different pharmaceutical firms. Interviews were used to gather thick description by conducting detailed interviews.

9.3.4 Data Analysis

Conducting thematic analysis, it is a basic method of qualitative data analysis. This tool allows researchers to identify and analyze themes within the collected data. Our model contains process of five methods to analyze our data gathered through interview. Researcher started to select the significant statements that are related to the

study as shown in Table 9.1. Then in Table 9.2, all those significant statements that were extracted from transcription are now converted into formulated meaning that shows the expressions and what interviewees meant. Then in Table 9.3, we formed initial themes by merging similar formulated meaning so we can contextualize our study. In last Table 9.4 shows the formulation of cluster themes by merging of initial themes and then transforming them into emergent themes.

In particular, after the recording has been transcribed and formed into transcription then following steps were followed as shown in Fig. 9.2.

9.4 Higher End Qualitative Analysis

Table 9.1 shows the higher end qualitative analysis where significant statement are separated from the overall transcription.

Table 9.2 shows how meaning is given to the extracted significant statements keeping in mind the context of the situation, setting and the research in mind.

Table 9.3 shows how initial themes are derived from the formulated meaning statements that were extracted from the significant statements.

Table 9.4 shows how Themes clusters are extracted from initial themes that were derived from the formulated meaning statements which were extracted from the significant statements.

9.4.1 Findings

In Table 9.4, four key emergent themes are taken from the information shared by the managers of pharmaceutical firm in Pakistan. These emergent themes give the main points behind the operational inefficiencies of pharmaceutical supply chain in Pakistan and a how can we overcome by choosing such innovative approaches that can eliminate such inefficiencies. These factors have been classified into four themes, emerge from the data and be interpreted and explained in more detail in the following sections.

1. Government Regulations
2. Product Expertise
3. Continuous Forecasting
4. Technological Advancement

9.4.2 Government Regulations

Researcher finds out that government regulations are important while conducting business but it negatively affects the business process. Government policies badly

Table 9.1 Qualitative inquiry process

Significant statements	Address
So the major issue, what we so far faced like in few countries where our major contribution in sales, which are coming from are selling in PKR in our local currency but our import, the raw materials are in dollars	Transcription 1, P 53
So when we score that revenue in PKR and selling in PKR. And then when we convert in the open market to the dollar, so that basically hurt our profitability and definitely the supply chain	Transcription 1, P 53
Like in the current economic situation as I mentioned before that the LC was stop by the Ministry of Finance Pakistan, that they have imposed sanctions that no one can issue the major and the big volume LC because of the inflation and all that	Transcription 1, P 53
So this is the factor which majorly influencing the import of raw material because if we are unable to import the raw material so how can we convert it to finish good and how can we supply to the field of sales and how can we secure our business revenue as well as profitability of the principal	Transcription 1, P 53
Actually, you know, I myself as a business student, there are factors which majorly influencing the business like some of which are in the grip of the internal principle	Transcription 1, P 53
So all these factors effect and what I mentioned before the major challenge is the economy of the country to that is one thing	Transcription 1, P 53
Therefore, the next thing is that I mentioned before that our major sales are coming from Sri Lanka and Afghanistan	Transcription 1, P 53
In Sri Lanka you can see the same problems. They are facing the economical crisis and in Afghanistan in last August, the regime change leads to the major breakthrough and economical crisis as well as the LC's opening	Transcription 1, P 53
What condition Pakistan today is passing that it is passed by Afghanistan even still the financial institution are closed, so that what it hurts that not only the pressure on the import business to import those raw material but as well as selling those materials underground in the field of sales	Transcription 1, P 53
So definitely we are unable to even get dollars through the legal channels	Transcription 1, P 53
So ultimately this is one thing, the second thing which I have observed as a business student (supply chain), that even Pakistan is now imposed a new duties and shipments or those process in PKR like in Afghanistan if I have got order of 56 million PKR, so now I'm unable to grab that money through the legal channels	Transcription 1, P 53
So what I need to I should have that money to supply that drug like that product that finish good because I have a team there that needs to supply that	Transcription 1, P 53
Pakistan government is not cooperating and even now they impose a new tax of 1.5% against the invoice generated	Transcription 1, P 54
If you receive the payment in the banks against the export in Afghanistan so you will pay 1.25% additionally to the government because you are not grabbing dollar from the foreign while you are exporting your goods to the foreign	Transcription 1, P 54

(continued)

Table 9.1 (continued)

Significant statements	Address
Yes, the next thing is the Border closure. Like if I talk about the Southeast Asian countries like Russia, Moscow, Uzbekistan, Tajikistan, Azerbaijan, there we have a business but only violent shipment through Afghanistan	Transcription 1, P 54
However, if the situation is not good and stable so we are unable to supply those finish goods to the ground of sales	Transcription 1, P 54
Yes, as business students we keep in mind that time is money. Therefore, the same phenomenon is applied in pharmaceutical business, pharmaceutical practices	Transcription 1, P 54
That time is important because the lead-time for those countries for delivering the finish goods, if I talk about import so the duties and illegal shipment clearance time is much longer	Transcription 1, P 54
And most of the time, we were out of stocks because on the back we don't have stock to pile up there on the ground to be sold by our sales team. Therefore, the time is important	Transcription 1, P 54
The lead time is important that it should must be not more, when the situation were smooth in Afghanistan like this whole route for all the other countries depending on this route of Afghanistan, like Russia and the CIS countries	Transcription 1, P 54
I think the lead-time consisting around 25 days but now the recent shipment lead times to around 45–60 days	Transcription 1, P 54
So yes, time is money and definitely time matters in terms of timely delivery of the goods reflecting and securing of good revenue	Transcription 1, P 54
We are submitting sales number to the manufacturing plant for around 12 months that we will, we will lift up certain amount of these quantities in particular manner	Transcription 1, P 54
Therefore, they are already prepared and for at least three months, they built and pile up the stock in the FG finish good warehouse	Transcription 1, P 54
Now, the major challenge is the import of the raw material and the export of the finish goods from the factory gate to the distributor of the business partner, distributor warehouse that time thus affecting our revenue, this is a major thing	Transcription 1, P 54
What we have in control that is manufacturing time, yes no issue	Transcription 1, P 54
That is in our hand, might be to increase the number of labor, we can run the plant for 24-h	Transcription 1, P 54
We can expand our plant technology. Therefore, that is how we can increase our production	Transcription 1, P 54
That is in our control but I mentioned before the import and export delivery, these both are taking much time	Transcription 1, P 54
Every company desire to process quality material, not only in the shape of raw material but also in case of processing, technology, plant and office material between everything that matter	Transcription 1, P 55
In addition, I think it within my organization, CCL Pharma they maintain a proper decorum within the plant, office, and people are working in good environment and they are well-equipped and good material we are importing	Transcription 1, P 55

(continued)

Table 9.1 (continued)

Significant statements	Address
This is what an entrepreneur desires that they import the good material and even after conversion to finish goods they supply good product to the consumer	Transcription 1, P 55
That is how they can make the USP, the unique selling point that we are the company who import good quality as we have one branch of manufacturing in Vietnam and one certification we have in Canada	Transcription 1, P 55
Therefore, what we need to meet those criteria, requirement or those regulatory requirement to be fulfilled	Transcription 1, P 55
Therefore, for that kind of desire level, we need to import a good material process in a very good environment to supply good medicine in proper cool chain maintenance system to the end user that is consumer	Transcription 1, P 55

affect the process by creating delays in process. Time is important and usually processes takes longer time because of these regulations and should work on minimizing that time. Because delays in any single process affects the whole system of supply chain of pharmaceutical firms (Ghauri et al. 2022).

9.4.3 *Product Expertise*

Due to lack of product knowledge, it affects the pharmaceutical supply chain and results as operational inefficiencies. It is high in cost to develop such practice but it lift ups the efficiency of firms operations as by the help of such practice you would have the product knowledge and control in the markets (Maio et al. 2022).

9.4.4 *Continuous Forecasting*

Researcher finds out that due to inexperienced situations, which are experienced first time can be challenging and affects the operations of supply chain of pharmaceutical firms. Managers of firm can initiate such approach to overcome such challenges by maintaining proper stock levels all the time and go with more advance real time forecasting tools to avoid such inefficiencies. This can be opt as innovative approach (Jiang et al. 2019).

Table 9.2 The significant statements

Significant statements	Formulated meanings
So the major issue, what we so far faced like in few countries where our major contribution in sales, which are coming from are selling in PKR in our local currency but our import, the raw materials are in dollars. (Transcription 1, P 53)	Manager felt issue that transaction of money in different currencies affects the business revenue
So when we score that revenue in PKR and selling in PKR. Then when we convert in the open market to the dollar, so that hurt our profitability and definitely the supply chain. (Transcription 1, P 53)	Manager raises the issue by selling in local currency and buying in dollars effects business revenue
Like in the current economic situation as I mentioned before that the LC was stop by the Ministry of Finance Pakistan, that they have imposed sanctions that no one can issue the major and the big volume LC because of the inflation and all that. (Transcription 1, P 53)	Manager mentions that business gets ineffective due to government policies and regulations
So this is the factor which majorly influencing the import of raw material because if we are unable to import the raw material so how can we convert it to finish good and how can we supply to the field of sales and how can we secure our business revenue as well as profitability of the principal. (Transcription 1, P 53)	Manager felt that government rules majorly affects the supply chain process and results in low revenue
Actually, you know, I myself as a business student, there are factors which majorly influencing the business like some of which are in the grip of the internal principle. (Transcription 1, P 53)	Manager shares by experience that internal principles effects the business operations
So all these factors effect and what I mentioned before the major challenge is the economy of the country to that is one thing. (Transcription 1, P 53)	Manager mentions that economical conditions of a country effect the business process
Therefore, the next thing is that I mentioned before that our major sales are coming from Sri Lanka and Afghanistan. (Transcription 1, P 53)	Manager mentions the places of operations
In Sri Lanka you can see the same problems. They are facing the economical crisis and in Afghanistan in last August, the regime change leads to the major breakthrough and economical crisis as well as the LC's opening. (Transcription 1, P 53)	Manager has experienced the business loss in revenue due to the economical crisis of business countries

(continued)

Table 9.2 (continued)

Significant statements	Formulated meanings
<p>What condition Pakistan today is passing that it is passed by Afghanistan even still the financial institution are closed, so that what it hurts that not only the pressure on the import business to import those raw material but as well as selling those materials underground in the field of sales. (Transcription 1, P 53)</p>	<p>Manager mentions the trade business is badly affected by the regulations of country</p>
<p>So definitely, we are unable to even get dollars through the legal channels. (Transcription 1, P 53)</p>	<p>Manager says that it is hard to sell products in dollars</p>
<p>So ultimately this is one thing, the second thing which I have observed as a business student (supply chain), that even Pakistan is now imposed a new duties and shipments or those process in PKR like in Afghanistan if I have got order of 56 million PKR, so now I'm unable to grab that money through the legal channels. (Transcription 1, P 53)</p>	<p>Manager says that business is affected by the new rules made by the government authorities</p>
<p>So what I need to I should have that money to supply that drug like that product that finish good because I have a team there that needs to supply that. (Transcription 1, P 53)</p>	<p>Manager says that one delay in process directly affects the whole process of business</p>
<p>Pakistan government is not cooperating and even now, they impose a new tax of 1.5% against the invoice generated. (Transcription 1, P 54)</p>	<p>Manager says that due to the new policies of taxation business is affected</p>
<p>If you receive the payment in the banks against the export in Afghanistan so you will pay 1.25% additionally to the government because you are not grabbing dollar from the foreign while you are exporting your goods to the foreign. (Transcription 1, P 54)</p>	<p>Manager says that government policies regarding taxation effect the business operations</p>
<p>Yes, the next thing is the Border closure. Like if I talk about the Southeast Asian countries like Russia, Moscow, Uzbekistan, Tajikistan, Azerbaijan, there we have a business but only violent shipment through Afghanistan. (Transcription 1, P 54)</p>	<p>Manager felt that border closure is the reason in effecting business supply chain</p>
<p>However, if the situation is not good and stable so we are unable to supply those finish goods to the ground of sales. (Transcription 1, P 54)</p>	<p>Manager says if routes are closed so it effects the business process</p>
<p>Yes, as business students we keep in mind that time is money. Therefore, the same phenomenon is applied in pharmaceutical business, pharmaceutical practices. (Transcription 1, P 54)</p>	<p>Manager tells that time is essential part of supply chain in pharmaceutical business</p>

(continued)

Table 9.2 (continued)

Significant statements	Formulated meanings
That time is important because the lead-time for those countries for delivering the finish goods, if I talk about import so the duties and legal shipment clearance time is much longer. (Transcription 1, P 54)	Manager felt due to the strict policies, goods are delivered late and effect the whole process
And most of the time, we were out of stocks because on the back we don't have stock to pile up there on the ground to be sold by our sales team. Therefore, the time is important. (Transcription 1, P 54)	Manager felt that due to the long clearance time we get out of stock that effects the business process
The lead time is important that it should must be not more, when the situation were smooth in Afghanistan like this whole route for all the other countries depending on this route of Afghanistan, like Russia and the CIS countries. (Transcription 1, P 54)	Manager says that the lesser the time to purchase raw material the effective the business will get
I think the lead-time consisting around 25 days but now the recent shipment lead times to around 45–60 days. (Transcription 1, P 54)	Manager has experienced the business process take longs time than the usual time because of the route problem
So yes, time is money and definitely time matters in terms of timely delivery of the goods reflecting and securing of good revenue. (Transcription 1, P 54)	Manager says that if business process takes longer time it creates ineffectiveness
We are submitting sales number to the manufacturing plant for around 12 months that we will, we will lift up certain amount of these quantities in particular manner. (Transcription 1, P 54)	Manager says proper procurement of goods makes the business process effective
Therefore, they are already prepared and for at least three months, they built and pile up the stock in the FG finish good warehouse. (Transcription 1, P 54)	Manager says that extra stock keeping help operations run smoothly
Now, the major challenge is the import of the raw material and the export of the finish goods from the factory gate to the distributor of the business partner, distributor warehouse that time thus affecting our revenue, this is a major thing. (Transcription 1, P 54)	Manager says that delays in process effects the business supply chain
What we have in control that is manufacturing time, yes no issue. (Transcription 1, P 54)	Manager say if procurement of goods takes less time automatically business gets better as other processes are in our hands
That is in our hand, might be to increase the number of labor, we can run the plant for 24-h. (Transcription 1, P 54)	Manager says that manufacturing of goods is effective if raw material is available in timely manner

(continued)

Table 9.2 (continued)

Significant statements	Formulated meanings
We can expand our plant technology. Therefore, that is how we can increase our production. (Transcription 1, P 54)	Manager felt that if raw material is available at given time other process would get effective
That is in our control but I mentioned before the import and export delivery, these both are taking much time. (Transcription 1, P 54)	Manager says that trading of goods takes longer time period that affects the business process
Every company desire to process quality material, not only in the shape of raw material but also in case of processing, technology, plant and office material between everything that matter. (Transcription 1, P 55)	Managers have mentioned that is good material is bought and processed so it positively affects your business
In addition, I think it within my organization, CCL Pharma they maintain a proper decorum within the plant, office, and people are working in good environment and they are well-equipped and good material we are importing. (Transcription 1, P 55)	Manager believes that good qualities and assurance effect positively to supply chain of pharmaceutical
This is what an entrepreneur desires that they import the good material and even after conversion to finish goods they supply good product to the consumer. (Transcription 1, P 55)	Manager say that businessperson should acquire quality product and services to make their business process effective
That is how they can make the USP, the unique selling point that we are the company who import good quality as we have one branch of manufacturing in Vietnam and one certification we have in Canada. (Transcription 1, P 55)	Manager believes if good quality and service is used and implemented in your business supply chain process it brings out positive change
Therefore, what we need to basically meet those criteria, requirement or those regulatory requirement to be fulfilled. (Transcription 1, P 55)	Manager tells that run business according to the updated rules and policies
Therefore, for that kind of desire level, we need to import a good material process in a very good environment to supply good medicine in proper cool chain maintenance system to the end user that is consumer. (Transcription 1, P 55)	Manager says that good quality can be maintained if goods are acquired according to updated versions of quality keeping technology
Therefore, material overall should be very good not only in shape of finish good supply to the consumer but also in case of import raw material. (Transcription 1, P 55)	Manager suggests to always buying good material as it effects the business operations

(continued)

Table 9.2 (continued)

Significant statements	Formulated meanings
I mentioned that cost definitely, if I am importing good quality material, raw material then all clearance duty like custom cost in shape of converting those raw material in finish good and then cost to deliver those finish pharmaceutical goods to patients. (Transcription 1, P 55)	Manager says that acquiring good services and desired quality you have to pay high cost
So all aspects and all multiple processes cost exactly, does matter. (Transcription 1, P 55)	Manager believes that cost effects the business operations
In addition, this is vital part of the any product in shape of importing the raw materials and conversion cost, as well as exporting those medicine at affordable price. (Transcription 1, P 55)	Manager believes that proper costing while acquiring and selling affect the business process
Like if I import any product with a very expensive price, because if thing will be good, the price will definitely be very high. (Transcription 1, P 55)	Manager felt to maintain quality you have to buy good quality material in high price
Like if I import any product with a very expensive price, because if thing will be good, the price will definitely be very high. (Transcription 1, P 55)	Manager believes prices reflect the business process
We can secure the employee salaries, and we need to compensate all these things including cost. (Transcription 1, P 55)	Manager believes that proper costing effects business process
It does matter and not only in shape of raw material importing but also offering the finish good to the end-user there that is patient at a very affordable cost. (Transcription 1, P 55)	Manager says that costing should be done in such manner that patient can afford it in your market
Most of the drugs are life-saving drugs, hypertension, or diabetes. So that's how we need to keep a price capping. (Transcription 1, P 55)	Manager says that prices of drugs should be done according to the whole operation of providing that drug

Source Author

9.4.5 Technological Advancement

Due to lack of technology operations of supply chain gets inefficient in pharmaceutical firms and if the pharmaceutical firms invest in new technologies with time so it will result in bringing efficiencies to the operations of supply chain. This can be used as innovative approach by installing new technologies to avoid operation inefficiencies (Zaman et al. 2023a).

Table 9.3 Meaning formulation

Formulated meanings	Initial themes
Manager mentions that economical conditions of a country affect the business process	Manager feels that economical conditions of every country affect the business process
Manager has experienced the business loss in revenue due to the economical crisis of business countries	
Manager tells that time is essential part of supply chain in pharmaceutical business	Manager experience that time is important and usually processes takes longer time and should work on minimizing that time
Manager felt that due to the long clearance time we get out of stock that affects the business process	
Manager says that if business process takes longer time it creates ineffectiveness	
Manager says that trading of goods takes longer time period that affects the business process	
Manager felt that time affects the SC process	
Manager believes that time is important factor and should be considerate while conducting business	
Manager says that time and cost should be considerate while conducting business as it effects the business operations	
Manager feels that time changes and decisions should be taken according to that	
Manager share the essence of time that time is more important even though it take cost to minimize operation time to enhance operation effectiveness	
Manager mentions that business gets ineffective due to government policies and regulations	
Manager felt that government rules majorly affects the supply chain process and results in low revenue	
Manager mentions the trade business is badly affected by the regulations of country	
Manager says that business is affected by the new rules made by the government authorities	
Manager says that government policies regarding taxation effect the business operations	
Manager says that regulations of country should consider peoples income so they can afford the essential good	

(continued)

Table 9.3 (continued)

Formulated meanings	Initial themes
Manager felt that government regulations towards acquisitions of some materials affect the business	
Manager believes that regulation affects the whole process	
Manager says that business operations need to process according to regularities body	
Manager says that regulatory bodies effect the business operations	
Manager says that when company follows WHO guide lines it makes the regulatory requirements fulfilled as well	
Manager believes that regulatory requirements affect the business process of pharmaceutical sectors	
Manager says to ensure the quality of products, government regulations should be taken	
Manager says to sustain business effective you have to run according to government regulations	
Manager says that regulations effect the business operations	
Manager says that due to the new policies of taxation business is affected	
Manager felt due to the strict policies, goods are delivered late and affect the whole process	
Manager tells that run business according to the updated rules and policies	
Manager tells that government policies affect the whole process of pharmaceutical goods	
Manager felt that covid affected the business supply chain as new policies and the authorities made regulations	Manager has experience that government policies badly affect the process by creating delays in process
Manager tells about new policies of banning products from foreign affect the process	
Manager tells that it is important to follow with every policy	
Manager says that following international standard affects the business positively	
Manager says that policies affect the business operation and forecasting should be done to avoid time delays	

(continued)

Table 9.3 (continued)

Formulated meanings	Initial themes
Manager mentions that policies of different countries affect the business	
Manager believes that following international standard increases operations efficiencies	
Manager felt that following international standard help in pertaining efficiency	

Source Author

9.5 Conclusion

The purpose of this study was to assess the entire pharmaceutical supply chain within Pakistan. The known issues can be viewed as innovational approaches implemented to amend the supply chain systems of pharmaceutical companies that have inefficiencies in their operations.

This study fills a gap in the literature on supply chain management in pharmaceutical companies in the Asian region of Pakistan. It also contributes to the literature by examining the full extent of the pharmaceutical supply chain, using pharmaceutical companies as central organizations. Previous book chapter examining aspects of the pharmaceutical supply chain focused primarily on the upstream part of his pharmaceutical supply chain, including pharmaceutical manufacturers (Narayana et al. 2014).

The current investigation identifies four key areas of inefficiency affecting his pharmaceutical supply chain in Pakistan: Government regulations, continuous forecasting, product expertise, and technological advancements. In addition, this paper focuses on the issues observed in Pakistan, providing greater clarity on pharmaceutical supply chain processes applied in Asian contexts and allowing generalization of research findings.

9.5.1 Insights and Implications Post-Covid Practice

This study is intended for exploration and gives useful farther theoretical understanding to development of supply chain strategies. The findings places four critical areas of intercession needed across the pharmaceutical supply chain. These findings may help us understand the operational inefficiencies facing by pharmaceutical companies and guide us to appropriate innovative solutions that can improve levels of efficiency and effectiveness (Ishizaka et al. 2023). This study examines a pharmaceutical company's supply chain in the context of Pakistan. The results of the survey therefore provide information on ineffective practices or best patterns that can be

Table 9.4 Cluster and emergent themes

Initial themes	Theme clusters	Emergent themes
Manager feels that government regulations are important while conducting business but it negatively affects the business process	Importance of following rules and procedures	Government regulations
Manager has experience that government policies badly effect the process by creating delays in process		
Manager experience that time is important and usually processes takes longer time and should work on minimizing that time	Competing against time	
Manager felt that delay in any single process affects the whole system		
Manager says that transit time should be less otherwise, it will affect the business		
Manager has experience that long routes and border closures effects the business process	Awareness of economical conditions	
Manager feels that economical conditions of every country affect the business process		
Manager has experience that converting currency affects the business revenue and system	Cost of the business	Product expertise
Manager believes that high cost affects the business process		
Manager experience that pricing of finish goods should be according to quality and process	Knowledge of product and market	
Manager suggest that product expertise helps bringing efficiency in the system		
Manager felt if goods are bought in proper time, it makes the system effective	Overseeing the future opportunities	Continuous forecasting
Manager believes that future forecasting should be on advance level to make better decisions		
Manager experience that inexperienced situations affects the business, as they are new to tackle	Maintaining stock levels	
Manager felt that availability of goods is important to make system more effective		
Manager felt that extra stock keeping helps in urgent requirement issues	Investing in new technology	Technological advancement
Manager believes that technological advancement can make the business more effective and efficient, as it will smoothly run the business in less time		
Manager believes when good material is purchased and processed so it positively affects the business process	Maintaining quality in operations	
Manager suggests if quality is maintained then it results as effective and efficient business flow		

Source Author

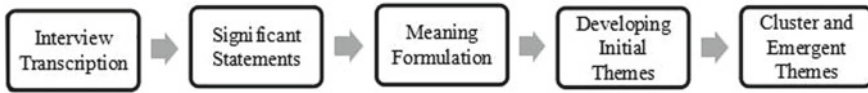


Fig. 9.2 Steps involve in transcription. *Source* Author

applied in Pakistan. This study focuses on drug supply chain practices in pharmaceutical companies. It is also worth investigating and studying the pharmaceutical supply chains of other healthcare institutions to understand the impact produced by the actions of other stakeholders. While this study provides insight into the factors that can influence the performance of a pharmaceutical business, focusing on a specific pharmaceutical supply chain can add additional information, based on that can make research that is more reliable (Zaman et al.). Future research is needed on the pharmaceutical supply chain strategies that are followed by other different Asian countries and to the opposite side of Asian borders. Additionally, future studies may improve the generalizability of the findings when conducted in other industries, such as the food industry.

9.5.2 Limitations

Given the relatively high workload of professionals working in pharmaceutical companies, some potential participants were reluctant to participate in this study. Furthermore, the study only focused on pharmaceutical companies, excluding professionals operating in the supplier and consumer sectors. Another obstacle encountered, especially in the data collection process, is related to geographical distance, the researcher only approached potentially reachable participants. Finally, a final limitation of this study arose from how data analysis was performed as the thematic analysis was conducted by the researcher.

References

- Arif, M., Shah, A., and Khan, S. (2023), "The role of artificial intelligence (AI) in shaping sustainable and resilient digital supply chains", *Pakistan Journal of International Affairs*, Vol. 6 No. 3.
- Al-Balushi, S., Sohal, A.S., Singh, P.J., Al Hajri, A., Al Farsi, Y.M. and Al Abri, R. (2014), "Readiness factors for lean implementation in healthcare settings – a literature review", *Journal of Health Organization and Management*, Vol. 28 No. 2, pp. 135–153.
- Bam, L., McLaren, Z.M., Coetzee, E. and von Leipzig, K.H. (2017), "Reducing stock-outs of essential tuberculosis medicines: a system dynamics modelling approach to supply chain management", *Health Policy and Planning*, Vol. 32 No. 8, pp. 1127–1134.
- Bamford, D., Forrester, P., Dehe, B. and Leese, R. (2015), "Partial and iterative lean implementation: two case studies", *International Journal of Operations & Production Management*, Vol. 35 No. 5, pp. 702–727.

- Bhakoo, V., Singh, P. and Sohal, A. (2012), "Collaborative management of inventory in Australian hospital supply chains: practices and issues", *Supply Chain Management: An International Journal*, Vol. 17 No. 2, pp. 217–230.
- Bhandari, P., Badar, M.A. and Childress, V. (2020), "On socioeconomic impacts of technological advancements in healthcare," *IEOM Proceed. of the 5th North American Conf. on Industrial Engr and Operations Mgmt, Detroit, MI, USA, 2921–2930*, <http://www.ieomsociety.org/detroit2020/papers/591.pdf> (Aug 10–14).
- Birkie, S.E., Trucco, P. and Campos, P.F. (2017), "Effectiveness of resilience capabilities in mitigating disruptions: leveraging on supply chain structural complexity", *Supply Chain Management: An International Journal*, Vol. 22 No. 6, pp. 506–521.
- Breen, L. and Xie, Y. (2015), "Waste not, want not. What are the drivers of sustainable medicines recycling in national health service hospital pharmacies (UK)?", *International Journal of Procurement Management*, Vol. 8 Nos 1/2, p. 82.
- Chassin, M. (2013), "Improving the quality of health care: what's taking so long?", *Health Affairs*, Vol. 32 No. 10, pp. 1761–1765.
- Cherrett, T.J., Maynard, S., McLeod, F.N. and Hickford, A.J. (2012), "Reverse logistics for the management of waste", in McKinnon, A. (Ed.), *Green Logistics: Improving the Environmental Sustainability of Logistics*, Kogan, London, GB, pp. 242–262.
- Davies, B. and Edwards, N. (2013), "Sustaining Knowledge Use. In Knowledge Translation in Health Care: Moving from Evidence to Practice, Straus, S.E., Tetroe, J. and Graham, I.D. (Eds), Wiley-Blackwell, West Sussex, UK, pp. 165–173.
- De Vries, J. and Huijsman, R. (2011), "Supply chain management in health services: an overview", *Supply Chain Management: An International Journal*, Vol. 16 No. 3, pp. 159–165.
- Ferreira, D., Marques, R. and Nunes, A. (2018), "Economies of scope in the health sector: the case of Portuguese hospitals", *European Journal of Operational Research*, Vol. 266 No. 2, pp. 716–735.
- Forsund, F. (2017), "Measuring effectiveness of production in the public sector", *Omega*, Vol. 73, pp. 93–103.
- Ghauri, S., Khan, M. I., Khan, S., and Afandi, K. R. (2022), "The nexus between economic growth, corruption and external debt in Pakistan", *International Journal of Social Science & Entrepreneurship*, Vol. 2 No. 2, pp. 96–114.
- Guerrini, A., Romano, G., Campedelli, B., Moggi, S. and Leardini, C. (2018), "Public vs private in hospital efficiency: exploring determinants in a competitive environment", *International Journal of Public Administration*, Vol. 41 No. 3, pp. 181–189.
- Ishizaka, A., Khan, S. A., Kheybari, S., and Zaman, S. I. (2023), "Supplier selection in closed loop pharma supply chain: a novel BWM–GAIA framework", *Annals of Operations Research*, Vol. 324 No. 1–2, pp. 13–36.
- Jiang, Y., Xiao, L., Jalees, T., Naqvi, M. H., and Zaman, S. I. (2018), "Moral and ethical antecedents of attitude toward counterfeit luxury products: evidence from Pakistan", *Emerging Markets Finance and Trade*, Vol. 54 No. 15, pp. 3519–3538.
- Jiang, Y., Miao, M., Jalees, T., and Zaman, S. I. (2019), "Analysis of the moral mechanism to purchase counterfeit luxury goods: evidence from China", *Asia Pacific Journal of Marketing and Logistics*, Vol. 31 No 3, pp. 647–669.
- Jamali, D., Hallal, M. and Abdallah, H. (2010), "Corporate governance and corporate social responsibility: evidence from the healthcare sector", *Corporate Governance: the key sources of operational inefficiency Marina Papalex, David Bamford and Liz Breen Supply Chain Management: An International Journal Volume 25 · Number 6 · 2020 · 617–635 631 International Journal of Business in Society*, Vol. 10 No. 5, pp. 590–602.
- Khan, S., Rasheed, R., and Muhammad, G. (2022a), "A SEM-based approach towards the Utilization of Technology and its Relationship to the performance of private business education institutions", *Propel Journal of Academic Research*, Vol. 2 No. 2, pp. 1–22.
- Khan, S., Zaman, S. I., and Rais, M. (2022b), "Measuring student satisfaction through overall quality at business schools: a structural equation modeling: student satisfaction and quality of education", *South Asian Journal of Social Review* (issn: 2958–2490), Vol. 1 No. 2, pp. 34–55.

- Khan, S. A., Mubarik, M. S., Kusi-Sarpong, S., Gupta, H., Zaman, S. I. and Mubarik, M. (2022c), "Blockchain technologies as enablers of supply chain mapping for sustainable supply chains", *Business Strategy and the Environment*.
- Khan, S. A., Mubarik, M. S., Kusi-Sarpong, S., Zaman, S. I. and Kazmi, S. H. A. (2021a), "Social sustainable supply chains in the food industry: a perspective of an emerging economy", *Corporate Social Responsibility and Environmental Management*, Vol. 28, pp. 404–418.
- Khan, S. A., Agyemang, M., Ishizaka, A., Zaman, S. I., Ali, S. M., and Laval, J. (2021b), "Barriers and overcoming strategies to multi-tier sustainable supply chain management: an explorative study in an emerging economy", *International Journal of Sustainable Engineering*, Vol. 14, No. 6, pp. 1484–1495.
- Kissi, M., Walston, J.D. and Badar, M.A. (2021), "Statistical analysis of rural hospital closures in the USA," *Int. J. of Forensic Engineering and Mgmt*, 1(2), 209–224, doi: <https://doi.org/10.1504/IJFEM.2021.120186>.
- Matthews, B. and Ross, L. (2010), *Research Methods: a Practical Guide for the Social Sciences*, Pearson Education, Essex.
- Miao, M., Jalees, T., Zaman, S. I., Khan, S., Hanif, N.-U.-A. and Javed, M. K. (2022), "The influence of e-customer satisfaction, e-trust and perceived value on consumer's repurchase intention in b2c e-commerce segment", *Asia Pacific Journal of Marketing and Logistics*, Vol. 34 No. 10, pp. 2184–2206.
- Mubarik, M. S., Bontis, N., Mubarik, M., Mahmood, T. 2022. Intellectual capital and supply chain resilience. *Journal of intellectual capital*, Vol. 23, pp. 713–738.
- Mubarik, M. S., Naghavi, N., Mubarik, M., Kusi-Sarpong, S., Khan, S. A., Zaman, S. I. and Kazmi, S. H. A. 2021. "Resilience and cleaner production in industry 4.0: role of supply chain mapping and visibility", *Journal of cleaner production*, Vol. 292, pp. 126058.
- Mustaffa, N.H. and Potter, A. (2009), "Healthcare supply chain management in Malaysia: a case study", *Supply Chain Management: An International Journal*, Vol. 14 No. 3, pp. 234–243.
- Narayana, S., Kumar Pati, R. and Vrat, P. (2014), "Managerial research on the pharmaceutical supply chain – a critical review and some insights for future directions", *Journal of Purchasing and Supply Management*, Vol. 20 No. 1, pp. 18–40.
- Narayanamurthy, G., Gurumurthy, A., Subramanian, N. and Moser, R. (2018), "Assessing the readiness to implement lean in healthcare institutions – a case study", *International Journal of Production Economics*, Vol. 197, pp. 123–142.
- Papalex, M. (2017), "An investigation into the aspects of innovation within the downstream domain of the pharmaceutical supply chain", PhD thesis. University of Huddersfield.
- Papalex, M., Bamford, D. and Dehe, B. (2015), "A case study of Kanban implementation within the pharmaceutical supply chain", *International Journal of Logistics Research and Applications*, Vol. 19 No. 4, pp. 239–255.
- Pondhe, P., Asare, S.A., Badar, M.A., Zhou, M. and Leach, R. (2006), "Applying lean techniques to improve an Emergency Department," *Proceed. of the IIE Annual Conference 2006*, CD-ROM, Orlando, FL (May 20–24).
- Scheller, E.S. and Smeltzer, L.R. (2006), *Strategic Management of the Health Care Supply Chain*, 1st ed., Wiley, San Francisco, CA.
- Sen, M., Chaudhury, A., Singh, R., John, J. and Ramachandran, R. (2013), "Multi-scale flow sheet simulation of an integrated continuous purification – downstream pharmaceutical manufacturing process", *International Journal of Pharmaceutics*, Vol. 445 Nos 1/2, pp. 29–38.
- Uthayakumar, R. and Priyan, S. (2013), "Pharmaceutical supply chain and inventory management strategies: optimization for a pharmaceutical company and a hospital", *Operations Research for Health Care*, Vol. 2 No. 3, pp. 52–64.
- Wang, Z., Zhang, X., Huang, Y. and Wang, H. (2015), "Comprehensive evaluation of pharmaceuticals and personal care products (PPCPs) in typical highly urbanized regions across China", *Environmental Pollution*, Vol. 204, pp. 223–232.

- Xie, Y. and Breen, L. (2014), "Who cares wins? A comparative analysis of household waste medicines and batteries reverse logistics systems", *Supply Chain Management: An International Journal*, Vol. 19 No. 4, pp. 455–474.
- Zaman, S. I., Khan, S. A., and Khan, S. "Supply chain agility and organization performance: a resource based view".
- Zaman, S. I., Khan, S. A., Qabool, S., and Gupta, H. (2023a). "How digitalization in banking improve service supply chain resilience of e-commerce sector? a technological adoption model approach", *Operations Management Research*, Vol. 16, No. 2, pp. 904–930.
- Zaman, S. I., Khan, S., Zaman, S. A. A., and Khan, S. A. (2023b). "A grey decision-making trial and evaluation laboratory model for digital warehouse management in supply chain networks", *Decision Analytics Journal*, p. 100293.