

SUPPLY CHAIN DURING COVID-19 PANDEMIC: A SYSTEMATIC REVIEW

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Abstract

The COVID-19 pandemic is an unusual occurrence that has drawn the attention of researchers to global supply chains. This paper is based on a systematic review of the literature, referring to PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines. This study has been extracted and gathered from the reference journals (such as Scopus, Web of Science, etc.). The final size of 60 articles were referred. This research examines the effects of a pandemic upon every segment of the supply chain. This research focuses on all three angles of the supply chain: demand, supply, and logistics. It has been explored that the supply chain liabilities associated with preliminary COVID-19 detentions are largely influenced by the number of countries putting restrictions, and the setbacks are more delicate to the length of a lockdown than its restraint. This paper possesses the uncertainty seen in demand, the scarcity of raw materials, the unavailability of vehicles, the constraints in storage, and the scarcity of human capital. Since the pandemic affected many market sectors, this paper investigates the health sector, the food sector, and the FMCG sector. However, it is uncertain what is conveyed about this, as well as what possible repercussions Supply Chain Management (SCM) might incur.

Keywords: Supply Chain, COVID-19, Social Restrictions, Uncertainty, Constraints, Prisma, Pandemic

1. Introduction

The COVID-19 pandemic has had an unprecedented impact on the world. The virus, which first arrived in Wuhan, China, in late 2019, has affected every country's economy and social life and had a major negative impact on businesses and their supply chains by reducing their efficiency and performance (Guan et al., 2020; Ivanov, 2020) and propagating disruption across the supply chain.

The effects of the coronavirus outbreak impacted every aspect of businesses and global supply chains (Ivanov & Dolgui, 2020). The businesses faced several challenges that reduced their efficiency and capacity. These challenges occurred due to border restrictions, lockdowns, interruptions in vehicle movement, and labour shortages (Paul and Chowdhury, 2020; Amankwah-Amoah, 2020). It has had multiple effects that are certain to have long term consequences (Govindan et al., 2020), including obstacles in supply chains (Ivanov, 2020); for example, 94% of 1,000 Fortune 500 companies have encountered supply chain disruptions (Fortune, 2020).

The three primary clusters of supply chains, namely demand, supply, and logistics, have all been severely affected by the COVID-19 pandemic (Mishra et.al., 2021; Sharma and Kumar, 2021). Various companies faced a supply shock where there was a material and labour shortage, and most of the businesses were unable to balance demand and supply. Many businesses experienced demand shock as demand for critical commodities such as personal protective equipment (PPE), ventilators, canned meals, etc. increased while the demand for non-essential commodities decreased. Due to this crisis, the buying behaviour of consumers has changed, which has highlighted the significance of digitalization. For instance, there was a rise in demand for home deliveries, cashless payments, online shopping, etc. The COVID-19 crisis has also disrupted the logistics side of the supply chain by disrupting the links between suppliers, productions, and consumers. It has also led to an excess shortage, which has damaged perishability and caused working capital blockages. The COVID-19 outbreak has also had an influence on the world's supply chain, which has enhanced the necessity of risk management. The emphasis was on just-in-time-inventory management, which lowers costs and boosts efficiency. However, it has become evident that these techniques don't effectively prepare the global supply chain to handle significant shocks (Govindan et al., 2020).

The COVID-19 effect on the supply chain has increasingly turned the attention towards the scholars. Several amounts of research have been done on supply chain disruption caused by the COVID-19 pandemic. Some studies advise further study and modification of supply chain strategies. The current study is an attempt to address the questions: (a) How the COVID-19 pandemic has affected the supply chain (b) What challenges does the COVID-19 pandemic pose to the supply chain? (c) How the COVID-19 pandemic has impacted several sectors, such as the health sector, the food sector, and the FMCG sector.

To respond to the above research questions, the researchers first identified the numerous difficulties companies encountered during the COVID-19 outbreak. Researchers have also learned about the COVID-19 pandemic's effects on a number of industries, including the food industry, FMCG industry, and health sector. This research is based on qualitative analysis and a systematic review of the literature. This paper has followed PRISMA guidelines (i.e., preferred reporting items for systematic review and meta-analyses) to examine the effects of COVID-19 on the supply chain.

The rest of the paper is organised as follows: Section 2 explains how the PRISMA approach was used to investigate the effects of COVID-19 on the supply chain; Section 3 contains the literature review; and Section 4 contains the discussion.

2. Research Methodology

The paper's approach is exploratory in nature and is based on a qualitative interpretation and a systematic review of the literature (Haque et al., 2021). This research follows the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines (PRISMA, 2021). This study has been extracted and gathered from the reference journals listed in Scopus and the Web of Science. The search criteria were based on the previous systematic review, articles, and empirical papers related to the effects of COVID-19 on supply chains. A detailed search was conducted inside the paper titles, abstracts, and keywords using the search phrases.

2.1 Article Inclusion and Exclusion criteria

The selection of the articles was based on the following criteria (Table 1):

Inclusion criteria	
Inclusion 1	Articles containing facts to investigate the research problem (effect of COVID-19 pandemic on supply chain)
Inclusion 2	Recognized articles (review articles, empirical papers)
Inclusion 3	Paper published or about to be published in the journal
Exclusion criteria	
Exclusion 1	The full text of articles not available
Exclusion 2	The articles that are not written in English
Exclusion 3	The paper which are not identified as an article or as an article coming from reliable source

Source: Authors' Compilation

2.2 Search Results

A total of 200 articles were initially shortlisted after the detailed screening. 80 articles were excluded because they failed to meet the necessary requirements for shortlisting. Further 65 articles were deleted based on the article inclusion criterion and availability. Towards the end of the cross-referencing phase, 5 additional papers were identified and included in the analysis (Figure 1). The selected articles had a final size of 60. Four different categories have been established for the shortlisted papers (Table 2.)

Table 2 Article classification based on shortlisted articles.

Area Of Research Study	Research Papers/ Journals	Research Report/ Company Report/ White Paper	Book	News Articles	Total
	40	12	2	6	60
COVID-19 Effects on Supply Chain	8	3	1	2	14
COVID-19 Effects on Food Supply Chain	4			1	5
COVID-19 Effects on FMCG	3				3

COVID-19 Effects on Customer Purchasing Behavior	2	1			3
COVID-19 Effects on Marketing Practices	3	2		2	7
COVID-19 Effects on Health sector	4	2			6
COVID-19 Effects on the Market both Pre and Post COVID	5	1	1		7
Effective Study of SCM	3	2			5
COVID-19 Effects on Traditional and Digital Marketing	4	1			5
COVID-19 Effects on logistics Management	4			1	5

Source: Authors' Compilation

The complete procedure for identifying, screening, and including of the articles to attain the target quantity is outlined below (Figure 1)

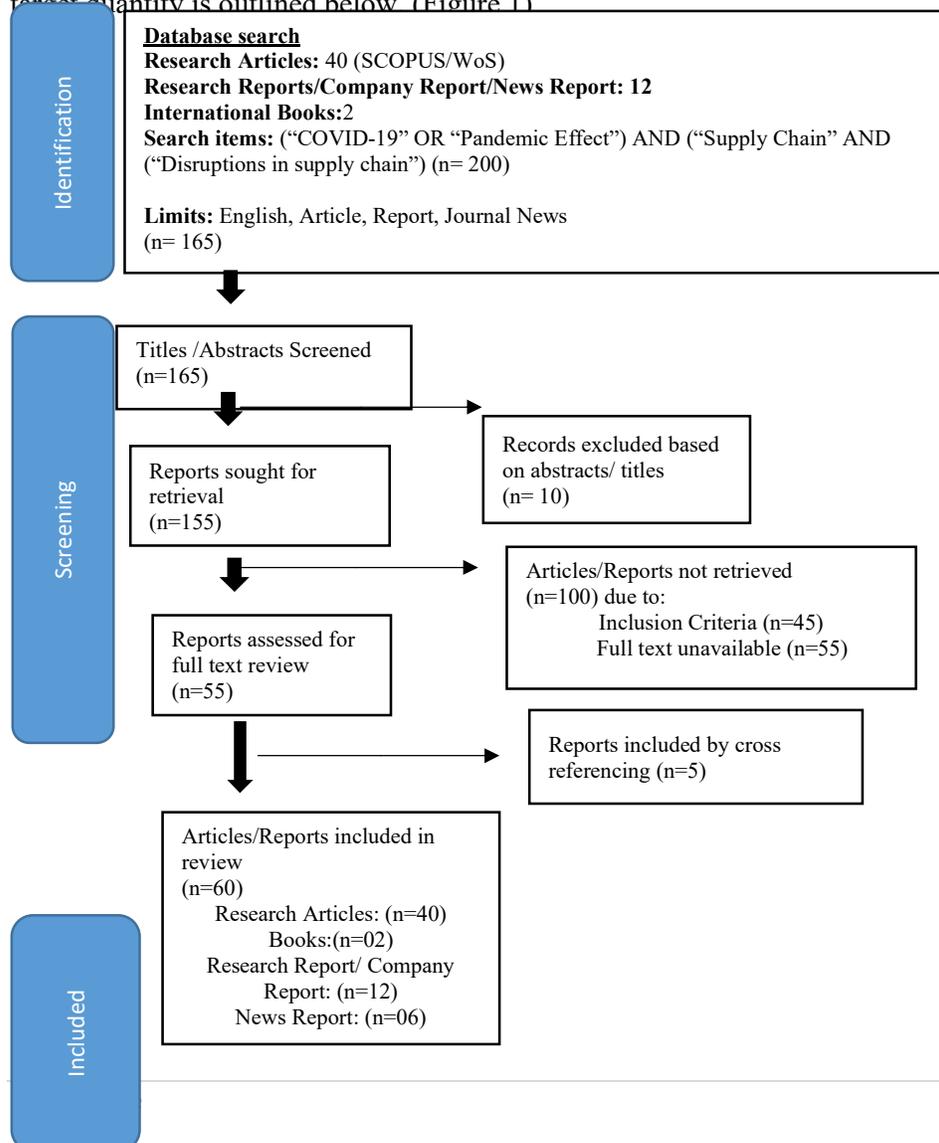


Figure 1: Flow diagram of the identification, screening, and inclusion of the articles

Source: Authors' Compilations

3. Literature Review

This research provides a brief theoretical underpinning for the impact of COVID-19 on supply chain practices. This review is well structured and divided into eight distinct sections that give readers an in-depth understanding of the influence of COVID-19 on supply chains and the consequences faced by companies.

3.1 COVID-19 and supply chain concepts

A supply chain includes all partners, like manufacturers, suppliers, transporters, warehouses, retailers, and customers, as well as all the operations within each business that are involved, directly or indirectly, in satisfying the customer's demand (Chopra and Meindl 2010). The supply chain is the combination of three or more groups connected to businesses or people who are directly involved in the upward and downward movement of goods, services, money, and data from a resource or a supplier to a customer (Mentzer et al., 2001). To maximise customer value and achieve and maintain a sustainable competitive advantage, SCM entails the effective involvement of certain activities and relationships. This is done by optimising SC in the most effective and efficient manner possible. Planning, scheduling, and regulating SC activities are necessary for organisations to successfully manage their operations (Bozarth and Handfield, 2016).

The COVID-19 pandemic has had a broad impact on supply chains and their management, causing the most massive disruption throughout the supply chain seen in recent years (Ivanov & Dolgui, 2020). COVID-19 has imbalanced the entire supply network, causing harm to many sectors by a huge margin (De Sousa Jabbour et al., 2020). Most businesses have delegated and extended many production and supply chain activities, resulting in a high reliance on global suppliers and increased complexity, making them particularly defenceless to SC instabilities (Bozarth and Handfield, 2016). Several research papers have explored the various facets of the impact of COVID-19 on each sector of SCM and what COVID-19 pandemics had caused to impact their sustainability. Many researchers have studied various aspects of the the COVID-19 pandemic's impacts on SCM, such as the ripple effects (Ivanov & Das, 2020) and the impact of COVID-19 pandemic on the Indian supply chain (Agrawal et al., 2020, Biswas & Das, 2020). Nevertheless, none of these papers provided a deep understanding of the challenges that businesses face or even what factors influence the obstacles to negatively impact the business.

3.2 Challenges in the supply chain during COVID-19

The influence of the COVID-19 outbreak on the global supply chains has been studied from three different perspectives: supply, demand, and logistics (Mishra et al., 2021; Sharma and Kumar, 2021). The crisis disrupted the supply chain by shifting customer buying habits, increasing demand for vital commodities while decreasing demand for non-essential commodities. Thus, tampering with the prices of various commodities. The pandemic broke down each segment of the supply chain. During the pandemic, there was an increased demand for essential goods such as medicines, foods, and ventilators, and businesses were driven to produce these items in large quantities. The shift in production focus into a specific field caused enormous demand interruptions in other products, and for large scale production, the availability of raw materials should have been provided in bulk, but instead every company faced an acute shortage of materials and labour shortages, resulting in an inconsistency in the

material supplies. nonetheless, even though the supply was made, there was issue such as transportation and storage shortages.

3.3 Supply chain disruption on the demand side.

COVID-19 has wreaked havoc on global supply chains. Businesses must maintain their operations, encounter requirements, and minimise supplier obstacles against a facade of serious deterioration to their teams, people, and local communities. The pandemic has harmed many components of supply chains. Its impacts could be seen in rising production and delivery costs, as well as labour shortages. The SC's demand aspect was disrupted because the pandemic had a significant impact on consumer purchasing perceptions.

The pandemic has shaped consumer purchasing decisions for both crucial and non-crucial commodities (Hakovirta and Denuwara, 2020; Mollenkopf et al., 2020). Although some sectors saw huge increases in demand, others saw large reductions (Cahn 2020; Johnson 2020; Sharma et al. 2020; Van Hoek 2020). The demand for essential goods such as food, groceries, medicines, and ventilators has risen (Paul and Chowdhury, 2020; van Hoek, 2020), leading to product shortages (Deaton and Deaton, 2020; van Barneveld et al., 2020). Consumers concerned about product shortages prompted panic buying at grocery stores (Cahn 2020; Van Hoek 2020; Zhu et al. 2020). When in an emergency, consumer behaviour shifts. Customers responded differently to the COVID-19 crisis. However, during the lockdown period, many businesses suffered significant losses as a vast number of products expired. The catastrophic change in consumer behaviour during the pandemic has forced marketers to change their business strategies to accommodate the new behavioural pattern.

Non-essential products, on the other hand, have experienced a decrease in demand as customer income has decreased (Abhishek et al., 2020; Chiaramonti and Maniatis, 2020). The prices of various commodities have been impacted by supply chain disruptions. During the crisis, Indian households curtailed non-essential expenditure, which resulted in a drop in demand for discretionary goods. According to one report, the demand for non-essential commodities has dropped by 50% in India. (The Economic Times, 2021).

3.3.1 Demand Uncertainty

The disruption in demand uncertainty occurred because of distorted customer behaviour and needs. It was difficult to determine the adequate number of supplies due to the shift in market requirements. There was a rapid growth in the demand for additional products such as facemasks, ventilators, hand sanitizers, etc. Furthermore, the outbreak had a psychological impact, causing consumers to stockpile goods such as essential groceries, rice, wheat, and so on. These shifts in demand interrupted the supply chain, while a business could make use of its capabilities and resources. According to Hippold (2020), COVID-19 has led to a shift in customer buying behaviour by disrupting demand. For example, the poultry and dairy industries have been impacted by the COVID-19 outbreak, and they have experienced an immediate drop in demand. Raw milk for household consumption has been designated an essential commodity, even though a large portion of milk demand comes from tea stalls, bakeries, sweet shops, and ice cream production. In some parts of India, demand for milk procurement has dropped by 30%. One of the reasons for the drop in demand in the poultry business was a misconception about the link between COVID-19 and poultry eating.

3.4 Supply chain disruptions on the supply side

Ivnanov and Dolgui (2020) discussed the effects of the supply chain, which led to a drastic reduction in the availability of supplies because firms were unable to balance supply and demand. As there was a huge shortage of materials, labour, transportation, etc. Initially, the most affected firms in the supply chain were those that were solely dependent on the inputs from China (Haren and Simchi-levi 2020; Lin and Lanng 2020; Zhu et al. 2020). We will be further discussing each challenges companies faced during the COVID-19 pandemic.

3.4.1 Supply Inconsistency

Due to the COVID-19 pandemic, supply side resource limitations, price volatility, and quantity volatility are major disruptors (Razdan and Kumar, 2020). Supply scarcity and corresponding inconsistency have been observed in micro, small, and medium enterprises (MSMEs), which are broadly distributed across India (The Economic Times, 2020). Consequently, the nation has experienced inconsistency multiple times when it comes to essential commodities. This is because every entity in the supply chain, from wholesalers to retailers, has been stashing, creating a false scarcity. It is obvious that this action will result in supply restrictions, unpredictable prices, and inconsistent supplies, all of which will hamper the efficient running of the supply chain.

3.4.2 Material Scarcity

The COVID-19 pandemic has become a huge global issue, impacting the supply chain. The global market has become uncertain due to the subsequent lockdowns in various countries. The COVID-19 pandemic has caused a lack of medical supplies, manufacturing equipment, and basic commodities. The crisis has led to uncertain consumer behaviour both during and after the lockdown. It has been regarded as a major threat to the availability of raw commodities and services (Razdan & Kumar, 2020). Various company operations have been interrupted because of the shutdowns; enterprises were unable to access raw materials. According to Bloomberg (2020), several sectors such as healthcare, vehicles, electronics, and chemical products suffered material shortages as imports were fully restricted during the lockdown. Raw materials that were acquired from other nations are no longer available to businesses. According to SDC Executives (2022), currently, 37% of global corporations have yet to put any plans into action, even though over 98% of them have plans to strengthen the stability of their industrial supply chains.

3.4.3 Labour Scarcity

The most significant issues that organisations around the world faced were supply chain disruptions and global labour shortages. According to the International Labour Organization (2020), the unorganised sector employs around 2 billion people, with the logistics sector alone employing over 40 million individuals. Several businesses faced a severe labour shortage because of the restrictions and shutdowns. Furthermore, according to The Economist (2020), 80 million workers relocated back to their hometowns because of the lockdown, resulting in wage reductions and, in some cases, job losses. The informal economy plays a significant role in growing economies like India, which rely heavily on manufacturing and service industries (Carnevale & Hatak, 2020). Lack of labour is a serious problem and a major obstacle to the supply chain's regular operation given the massive relocation of migrant workers.

3.5 Supply chain disruptions on the logistics side

By limiting transportation availability, the COVID-19 pandemic has broken transportation links between suppliers, manufacturing facilities, and customers (Kumar et al. 2020). Different modes of transportation, notably ocean shipping, air freight, trucks, and railways, have all been affected by vehicle movement restrictions in the transportation and logistics field (Gray, 2020). These transportation disruptions caused delays and hampered the seamless flow of products, as well as impacting international trade. Distribution and logistics patterns were rapidly changing. While the physical channel was the primary form of distribution for many years, the pandemic has driven many businesses to shift their operations entirely online or to adopt a dual online-offline approach. We had experienced major supply chain interruptions in logistics and storage, which are mentioned below:

3.5.1 Constraints in Storage

We identify the panic buying behaviour of consumers for essential commodities during the lockdown situation (Razdan & Kumar, 2020). With the COVID-19 outbreak, consumer optimism has declined, and they expect to reduce their savings for a long period of time (McKinsey, 2020). This may result in storage and capacity issues at warehouses and distribution centres (Hippold, 2020). Excessive material storage can result in damage, perishability, and working capital blockages, making it difficult for businesses to run their supply chains properly.

3.5.2 Unavailability of Vehicles

Various organisations encountered vehicle shortages and delays in delivering goods to customers due to the lockdown restrictions. According to Bloomberg (2020), while the lockdown in India resulted in a significant reduction in mobility, the situation did not improve after the government relaxed the restrictions. Similarly, commodity exports were stopped. Since public transportation hasn't yet resumed operations, there are additional issues with getting people to their workplaces. The standard public transportation choices are inoperable, and businesses frequently lack the vehicle fleets necessary to transport all employees. The need for social distance measures also prevents the use of existing vehicles to their full potential. The preceding transportation problems have contributed to unexpected delays in consignment delivery to end consumers and can be viewed as a challenge to the supply chain's smooth operation.

4. Sector-wise Assessment

4.1 Supply Chain Effect on the Health Sector

The COVID-19 outbreak had a major impact on the health sector in India. Most companies faced a huge challenge in maintaining a steady flow of goods and services. Whether it's medicines, masks, or ventilators, the supply chain has been facing multiple obstacles. The demand for pharmaceuticals increased as the use of antiviral agents increased. China is a major supplier of pharmaceutical ingredients to countries all over the world. The lockdown of the nation and the closure of factories have resulted in a shortage of medical products as well as cost increases for the materials required to produce generic drugs, thus leaving the producer facing difficulties in making and supplying end products to consumers.

In terms of both volume and value chain, India's pharmaceuticals sector ranks third worldwide. India spends around 1% of its GDP on healthcare, making the outbreak a public health issue in the country. Coronavirus has already caused chaos on global markets, causing a lack of hand sanitizers, a shortage of face masks, and several other interruptions in supply chain channels. The acquisition, purchasing, and maintenance of critical medical equipment's inventories have been significantly impacted by the breakdown in the healthcare supply chain. In such cases, demand-and-supply policies are disrupted. As a result, product prices rise at every level, from wholesalers to retailers to consumers (The Economic Times, 2020). Medical resources are also imported into India from the United States and Italy. As the infection rate grows, India requires 100,000 PPE suits every day (Business Insider, 2020). Its overdependence has exposed its vulnerability and pricing instability (Thepharmaletter.com, 2020). Other countries are also putting pressure on China to export pharmaceuticals, PPE, ventilators, and APIs. Moreover, Germany is another country that provides these materials, although obtaining them has grown challenging due to lockdown restrictions (The Economic Times, 2020). It will take approximately two to three years for the health sector to get back to normal, with all mitigation strategies fully operational. Until then, the healthcare industry will likely expand slowly.

4.2 Supply Chain Effect on the Food Sector

Every sector around the world is waiting to see how the COVID-19 outbreak will impact the industrial sectors, and the food industry isn't any different. The food industry, however, differs from other industries in that it produces products that are necessary for daily life. Everyone understands that if one assembly line closes, a certain number of individuals who work at these factories might get affected, but if manufacturers and distributors become inflamed, all individuals are at risk (Staniforth, 2020). Food sectors were highly impacted by the lockdown restrictions. The COVID-19 caused worker travel restrictions, changes in consumer demand, the closure of food manufacturing plants, a limited food trade agreement, and financial strain in the food supply chain. The farmers were forced to destroy food essentials on the field due to the restrictions. For example, milk was dumped by the dairy farmers due to the obstructed supply chain. The greatest challenges in the food supply chain were getting inputs from suppliers and supplying food from producers to consumers.

Initially, for some specific things, demand has decreased; for example, potatoes for French fries, milk for sweets, etc. In the beginning of the pandemic, consumers sometimes experienced empty racks in shops, as the food supply fluctuated with the sudden demand. (OECD 2020). The demand for bread increased by 76% and for vegetables by 52% in a week, but the interest in liquor didn't increase. Moreover, the demand for liquor increases after the month of the pandemic (Crisp, 2020). Subsequently, they faced challenges in meeting the growing market demand and concerns regarding the protection of the worker's health. It is crucial to protect the health of food industry employees during the COVID-19 outbreak (Food and Agriculture Organization and World Health Organization, 2020). Food supply chain strategies are essential to satisfying consumer needs. (De Sousa Jabbour et al., 2020). Furthermore, the food industry is a critically important economic sector. During the pandemic, however, the food sector faced distinct difficulties than any other sectors that aren't critical to daily life.

4.3 Supply Chain Effects on the FMCG Sector

According to Yogesh D. Mahajan (2020), the FMCG sector is highly affected by the COVID-19 pandemic. Fast-moving consumer goods (FMCG) is one of India's most vital industries,

with varied businesses including household, personal care, etc. According to Mahajan (2020), global demand for personal hygiene items like sanitary equipment is increasing at an alarming rate. FMCG is affected by various factors such as labourers moving back to their hometowns, challenges in logistics, changes in consumer buying patterns, and a rapid surge in demand for sanitary products while decreasing demand for others.

The Indian economy is undergoing substantial growth in the FMCG sector, which includes a wide range of businesses such as food, refreshments, grains, cosmetics, etc. (Girish Jakhotiya, 2020). The market for fast-moving consumer goods experienced significant changes, demand for consumer-packaged goods (CPG) increased sharply in hard-hit countries, while household goods spending increased as well. At first, people tried to decrease their chances of contracting the virus by going to the supermarket less frequently. Some customers began stockpiling water and food; others used e-commerce to buy products they would normally buy in a store. (Yogesh D. Mahajan, 2020) highlighted that the FMCG sector is heavily impacted by the COVID-19 pandemic as well as changes in consumer preferences. There is a shift occurring in which certain sectors will expedite while others will slow. Companies that can adapt to shifting demand dynamics and exhibit a resilient attitude would be able to overcome pandemics.

Table 2: Some major findings from literature on supply chain effects during the COVID-19 pandemic

Year	Paper Title	Findings
2022	Supply chain management during and post-COVID-19 pandemic: mitigation strategies and practical lesson learned.	The outcome of the study is to identify the challenges and barriers resulting from the COVID-19 outbreak that need immediate attention and to create strategies for dealing with the challenges.
2021	The impact of the coronavirus pandemic on supply chain and their sustainability – A text mining approach.	The text mining approach provides detailed insights on the impacts of COVID-19 on the supply chain.
2021	Surviving the hectic early phase of the COVID-19 pandemic- a qualitative study to the supply chain strategies of food services firms in terms of crisis	The strategies to respond to the crisis were to manage resources, diversify strategically, prioritise long term outcomes, and bond socially.
2021	Supply chain and the COVID-19 pandemic: A comprehensive framework	The finding of this study is to identify the main factors and elements related to supply chain disruption and to make proactive decisions.
2021	Supply chains under COVID-19 disruptions: literature review and research agenda.	Issues relating to: digitalizing the supply chain, localising the supply chain, the rising importance of safety, rethinking the concept of efficiency, and vaccine distribution

		and production activities, and making strategies to mitigate supply chain disruptions.
2021	The preliminary supply chain lessons of the COVID-19 disruptions- What is the role of digital technologies?	The finding is concerned with how digital technologies are part of resilience-driven solutions for the future supply chain.
2021	COVID-19 pandemic related supply chain studies: A systematic review	The findings of this paper reveal that most of the studies have focused on supply chains for essential goods, such as health care products, whereas SMEs have been ignored.
2021	Impacts of COVID-19 in food supply chain: Disruption and recovery strategy	The outcome of the study is to provide maintenance of employees' health and safety, a better working experience, and prevent the increment of food prices.
2020	Supply chain sustainability: learning from the COVID-19 pandemic	The study emphasises that there is a need to study in detail the long-term sustainability effect of the COVID-19 pandemic.
2020	Supply and demand shocks in the COVID-19 pandemic: an industry and occupation perspective	The finding of this study is that due to the COVID-19 pandemic, it likely can exacerbate income inequalities in society.

5. Discussion

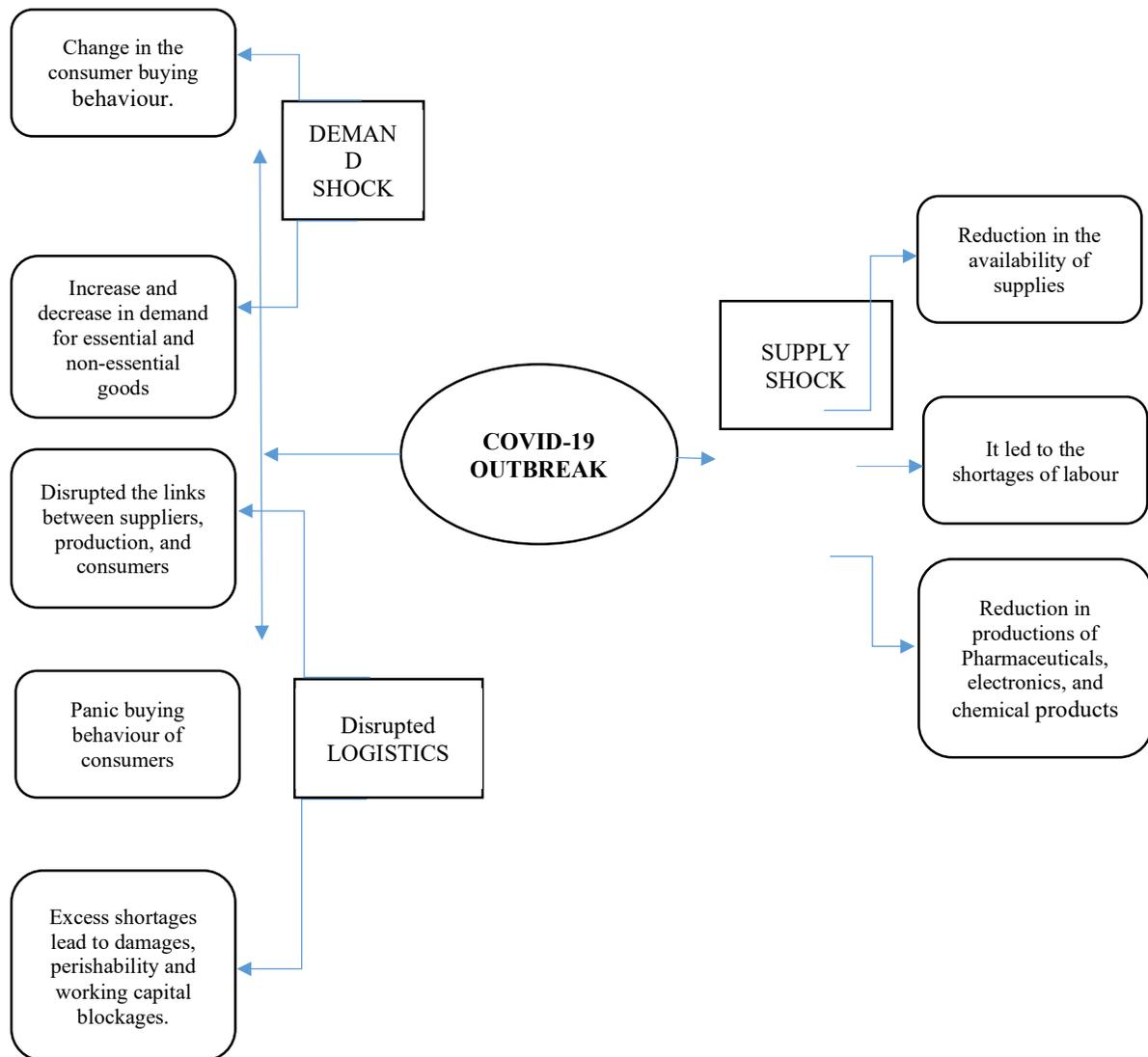


Figure 2: Conceptual model *Source: Author's Compilation*

Specifically, the study has identified three types of impacts of the COVID-19 pandemic on the supply chain, namely, demand disruptions, supply disruptions, and logistics disruptions.

First, we encountered COVID-19 effects on the demand side of the supply chain, where we discovered a significant amount of demand uncertainty, which was a challenge given the major impact on the supply chain. Moreover, demand uncertainty has changed consumer buying patterns and caused vehicle unavailability, replenishment delays, and temporary product shortages, all of which disrupted the supply chain during the COVID-19 lockdown.

Furthermore, consumer purchasing habits for both essential and non-essential commodities have changed (Hakovirta and Denuwara, 2020; Mollenkop et al., 2020). Initially, there was an increase in demands for necessary goods (such as food, medicines, ventilators, etc.), which resulted in temporary product shortages (Deaton and Deaton, van Barneveld et al., 2020). Moreover, both online and traditional distribution channels have experienced delays in delivering products to customers (Ivanov and Das, Panic buying, uncertainty about the future,

and warehousing are all reasons for such demand surges (Hobbs, Richard and Rickard, 2020). Moreover, there was a decline in demand for non-essential items as the income of consumers decreased. Consumers may want to put money aside in anticipation of future uncertainties (Abhishek et al., 2020, Chiaramonti and Maniatis, 2020).

Secondly, disruptions on the supply side have been impacted in various ways. (Razdan & Kumar, 2020) have stated that it is one of the most significant difficulties that have arisen because of the COVID-19 pandemic. According to the experts, issues such as vehicle unavailability and warehouse stocking have a significant impact on material supply. Supply inconsistencies have also resulted in material shortages; consequently, it should be highlighted that supply inconsistency is a challenge that is most closely linked to other aspects. It has also resulted in medical equipment, manufacturing, and consumer product shortages. COVID-19 had a significant impact on medical equipment due to temporary supply constraints. The most affected industries were pharmaceuticals, automobiles, electronics, and chemical products. According to the Economist (2020), during the COVID-19 pandemic, about 80 million migrant workers returned to their villages and hometowns due to lockdown restrictions and, in some cases, job loss. According to the findings, labour scarcity was the most significant hindrance to the supply chain's functioning during the COVID-19 outbreak.

Thirdly, the COVID-19 outbreak has broken the transportation links between suppliers, production facilities, and customers (Kumar et al. 2020). The shipping industry faced disruptions in all types of transportation facilities, like sea, air, and roads (Rojas 2020). According to the Bloomberg (2020) assessment, the country has a capacity of 9 million commercial trucks, but only around 15-20% of them are operational.

Moreover, logistical disruptions have increased storage constraints. The COVID-19 outbreak has had an impact on inventory capacity. Manufacturing firms may create and stock excess goods due to demand and supply uncertainty, resulting in restrictions on storage capacity at warehouses and distribution networks (Hippold, 2020). Excessive storage of goods has resulted in material deterioration, perishability issues, and working capital blockages. Moreover, we have observed the consumers' panic buying behaviour for vital commodities (Razdan & Kumar 2020). However, due to the panic buying behaviour of consumers, there was a rise in the demand for essential goods, while we observed a huge decline in the demand for non-essential commodities. Furthermore, we can state that COVID-19 has impacted the logistics side majorly and disrupted supply chain operations on a huge scale.

Conclusion

The COVID-19 outbreak's effects on the supply chain have demonstrated that pandemics can have severe consequences on the global supply chain and will continue in the future. This research deals with global supply chain disruptions, considering various aspects like unavailability of transportation, lack of supplies, demand shifts, and strain in logistics. Similarly, to our insight, this paper has focused on three sectors in particular: the food sector, the health sector, and the FMCG sector. According to our paper, the most significant challenges are lack of consistency in supply and insufficient manufacturing, followed by labour scarcity, vehicle unavailability, and delays in production as well as supply.

However, much more research is needed, and this research study will serve as a bridge between initial ideas and more established theories about supply chain disruptions caused by the COVID-19 pandemic. This review presents scholars and practitioners with interesting and insightful research avenues to investigate the instabilities of SCs induced by COVID-19.

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