An overview of the SWOT analysis in India's pharmaceutical supply chain

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Abstract

Purpose – The Indian pharmaceutical industry has contributed significantly to global healthcare by securing superior-quality, inexpensive and reachable medicines worldwide. However, supply chain management (SCM) has been challenging due to constantly shifting requirements for short lifecycles of products, the convergence of industry and changeable realities on the ground. This study aims to identify, assess and prioritize the strengths, weaknesses and opportunities of the pharmaceutical SCM environment in India.

Design/methodology/approach – The paper employs a Strength, Weakness, Opportunity, Threat (SWOT) analysis and recognizes strategies to utilize the advantages of the strengths and opportunities, rectify weaknesses and resolve threats.

Findings – A variety of strategies that could have a positive effect on the Indian pharmaceutical business are presented. Findings and suggested strategies can significantly advance knowledge, enhance understanding and contribute to the growth of a successful SCM for the Indian pharmaceutical sector.

Originality/value – This paper would act as a roadmap to greater comprehension of the market leaders and market leaders' operating climate. The findings from this study will offer academic scholars and business practitioners deeper insights into the environment of SCM.

Keywords Pharmaceutical, Healthcare, Supply chain management, Green practices, SWOT analysis

Paper type Research paper

1. Introduction

The pharmaceutical sector is a network of procedures, activities and organizations that discover, develop and manufacture drugs and medications (Mehralian, Zarenezhad, & Rajabzadeh Ghatari, 2015). It is one of the fastest-growing industries in the world and a significant contributor to the world economy (Chandra, Sridharan, & Shwetha, 2016). The pharmaceutical supply chain (PSC) is more complex due to unique procurement, production and preservation. PSC encompasses all activities that involve the flow of medication discovery and development, manufacturing, distribution and application across wide-ranging healthcare conveniences and other businesses that enable these various stages to work effectively. PSC typically begins with inbound logistics, where producers procure raw

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material from the vendors and turn it into the finished product. Produced pharmaceutical goods from the manufacturing sector will then head to the organizations' central warehouses. Then the goods are delivered to carrying and forwarding companies (C&F) to distribute to different stockholders/distributors/wholesalers, as needed. The products venture out to lakhs of retailers nationwide through these wholesalers. Finally, the drugs pass through these outlets to the end-users (Vishwakarma, Garg, & Barua, 2019).

The Indian pharmaceutical industry has contributed significantly to global healthcare by securing superior-quality, inexpensive and reachable medicines worldwide. It has enormously contributed to India's healthcare consequences and economy. Although the Indian pharmaceutical industry is recognized by volume as the third-largest market in the world, it is encountering many obstacles that have affected its development trajectory over the past few years (Jain, Ajmera, & Davim, 2022; Jain, Phoghat, Ajmera, & Sirvi, 2022; Mahajan, 2019). Many global trends have significantly affected the export market, turning the environment more volatile. Studies showed that exports from India are likely to experience intense international competition, especially for generic drugs that are highly price-sensitive (Mahajan *et al.*, 2015). In particular, supply chain management (SCM) has been challenging due to constantly shifting requirements for short lifecycles of products, the convergence of industry and changeable realities on the ground. In the pharmaceutical sector, SCM could transform the company to efficiently use capital and services, maximize income, improve shareholder value and respond vigorously to consumer demand (Afshan & Sindhuja, 2015; Desingh, 2022).

On the other hand, the failure of a successful SCM may trigger management issues (Sodhi & Tang, 2021). To maintain sustainability in such a highly volatile environment, evaluating global market dynamics and best practices along with effective implantation are to be seen as the only way to overcome challenges. Indian pharmaceutical firms invest one-third of their revenue in SCM operations because of their relatively weak transport network (Jain, Ajmera *et al.*, 2022; Jain, Phoghat *et al.*, 2022; Mahajan, 2019) Drugs are being halted by one day to reach the market expense of about US$1 million to the industries. Moreover, cost shares of logistics are 45-55% in the context of extra costs by the PSC, making the condition even worse (Parmata, 2016).

The general market concern is that certain Indian healthcare companies invest considerable capital in rectifying SCM issues. The particular problem with the industry is that the majority of the Indians in the healthcare industry business leaders struggle to minimize the expenses associated with SCM. Nevertheless, the consensus of experts in countries like India may not recognize the problems and obstacles related to this SCM due to a lack of knowledge about the industry environment. Although there have been various studies on SCM, few articles are available concerning these critical issues (Nabipour & Ülkü, 2021). Consequently, previous authors have suggested re-studying the problems for a better perspective (Ali *et al.*, 2021; Schweitzer & Lu, 2018). This paper will, therefore, focus on the external and internal environmental issues and best practices adopted in India by healthcare supply chain management (HSCM) from the different pharmaceutical industries. Particular emphasis is placed on the HSCM environment of the drug-producing and vaccine-producing industries, while issues regarding the medical device industry will be excluded. This study aims to identify, assess and prioritize the strength, weaknesses and opportunities of the pharmaceutical SCM environment in India by SWOT analysis and recognize strategies to utilize the advantages of the strengths and opportunities, rectify weaknesses and resolve threats.

The paper is divided into three sections. It begins with a brief discussion of the current market scenario and the critical contribution of SWOT analysis in the industrial environment assessment. The following section discusses the analysis of SWOT and the SWOT matrix, as well as a thorough review. Lastly, the last part of the paper presents the implications, limitations and suggestions for future research. Since it is the first effort to integrate SWOT in pharmaceutical products' HSCM, findings from this paper will offer academic scholars and

business practitioner's deeper insights into the environment of SCM. Besides, the application of the proposed strategies will have a positive influence on the growth of the HSCM.

2. India pharmaceuticals industry overview

The Indian pharmaceutical industry is currently the world's third-largest in volume and tenth-largest in size. The overall scale of the industry (including medications and medical devices) is about US$43 billion and is currently seeing a growth pace of 7–8% in the drug market. Net exports (medicines and medical equipment) amount to about US$20 billion, of which about 90% are medicines (DoP, 2022). Branded generic products lead the Indian pharmaceutical industry, contributing 70% of the market share in revenues. The generic drug market contributes 21%, while over-the-counter contributes 9% of the Indian pharmaceutical market of overall US$20 billion revenue. Regarding product diversities, the anti-infectious group dominates the sales revenue, generating nearly 16% of overall pharmaceutical sales. Products like cardiovascular medication sales contribute about 13%, the anti-diabetic drug shares around 7%, gastrointestinal drugs contribute 11%, vitamins 8%, minerals 9% and respiratory and pain/analgesic segments share about 7%. In comparison, other segments contributed approximately 29% of overall generic medicines sales in India (Chandra *et al.*, 2016).

Indian products are shipped to over 200 countries around the globe, with Japan, Australia, West Europe and the US as the main destinations. The country exported around US$18 billion in pharmaceutical products, with a reported rise of 10.72% from 2021 to 2022. India mainly exports to Russia, South Africa, the UK and the USA. Drug formulations and biologicals account for 77% of Indian pharmaceutical exports, with bulk and intermediate pharmaceuticals accounting for 21%. From 2021 to 2022, the share of bulk drugs, intermediate products, drug formulations and biologicals exported was around US$176 billion. Meanwhile, generic medications account for 20% of global exports, making the country the world's top provider of generic pharmaceuticals in volume. Currently, the pharmaceutical industry contributes around 1.72% to the gross domestic product (GDP) of the country (DoP, 2022).

3. Methodology

As mentioned in the introduction section, this paper aims to assess the strengths, weaknesses, opportunities and challenges of the Indian PSC industry by using SWOT analysis and developing effective strategies for progress. Data collection methods include an extensive review of past literature and field observation. The literature gathered for initial data collection comes from various sources which fit or are linked to this paper's keywords. Analysis of SWOT is an approach where an organization's strengths and weaknesses are measured coupled with the organization's externally encountered opportunities and threats. SWOT analysis effectively solves complicated strategic problems by plummeting the number of facts required to enhance decision-making (Lohrke, Mazzei, & Frownfelter-Lohrke, 2022). In addition, SWOT analysis is one of the most widely recognized and proven methods for strategic formulation (Ab Talib & Wahab, 2021) Past scholars proved that SWOT analysis offers a forum for understanding the desired potential role and identifying problems (Ab Talib & Wahab, 2021; Jain, Ajmera *et al.*, 2022; Mbazima, Mbonane, & Masekameni, 2022). It is an ideal tool for corporate planning, strategy analysis, evaluation of competitors, product growth and research report analysis (Budi, Bhayangkara, & Fadah, 2016; Puyt, Lie, De Graaf, & Wilderom, 2020).

Internal strengths and weaknesses, as well as external opportunities and threats, are included in the SWOT analysis. Environmental segregation has been undertaken in internal issues related to identity, layout, availability of tangible and intangible capital, potential and

profitability and external issues related to the political situation, economic turmoil, societal and technical developments and environmental issues. It can give policymakers a clearer view of how weaknesses can be turned into strengths by exploiting challenges and recognizing how risks will become opportunities without using strengths. The usage of SWOT analyses is extensive owing to their unique analytical framework, ranging from formulating strategies for individual industries, economies, states and multinational organizations and even regional analysis (Ab Talib & Wahab, 2021). The recent use of SWOT analysis can also be seen in environmental management (Herrera-Navarrete *et al.*, 2022), healthcare (Jain, Ajmera *et al.*, 2022), aviation management (Nam, Choi, Edell, De, & Song, 2023), pharmaceutical (Etukakpan *et al.*, 2023), SCM (Ab Talib & Wahab, 2021), tourism (Fan *et al.*, 2023) and infrastructure (Cheng, Huang, Guo, Li, & Chen, 2022). Based on the examples above, it is clear that using SWOT analysis for research and further understanding the HSCM environment through field observation of the pharmaceutical industry in India is an excellent tool choice. It may help develop strategies for the HSCM sector, which will improve the country's welfare through the relevant convention on the strengths and opportunities provided.

4. SWOT analysis

4.1 Strengths

4.1.1 Strong government support. The pharmaceutical sector in India continues to develop with Government initiatives and the involvement of the private sector. The Ministry of Health and Family Welfare has undertaken several steps to ensure drug quality is available in India (Ghosh, 2019). Various regulations and policies have been undertaken to ensure the quality of drugs. For example, in 2011, the Drug Advisory Committee said that any medication strip accessible in India should have a 2D barcode. It has reduced the production of counterfeited pharmaceutical goods and ensured some consistency. It also positively impacts the global pharmaceutical industry (Mohiuddin, Mazumder, Chrysostome, & Su, 2017). Moreover, the government ensures a licensing opportunity for all drug companies, patent policies and clinical trials and promotes research and development (R&D) in pharmaceutical sectors (Ghosh, 2019). Even during the coronavirus disease 2019 (COVID-19) pandemic, disaster, or crisis condition, the government of India will continue to provide vital support to the relevant industry players (Singh *et al.*, 2023). Currently, when global SCM, including the pharmaceutical industry, has blown out due to the COVID-19 crisis, the government of India discussed upholding construction factory authorizations along with the necessary clearances from the Ministry of the Environment and giving the electricity subsidies endorsing hubs for pharmaceutical development (Chatterjee, 2020).

4.1.2 Low production cost, labor cost and the expense of clinical trials. One of the greatest strengths that made India a pioneer in the pharmaceutical industry is its inexpensive labor and supply and low cost of drug output. India is the largest production hub for labor-intensive exports compared to China, Vietnam and other Asian countries (Fayaz & Kaur, 2022). It is even significantly lower than the United States, which gives India a competitive advantage (Ganesan & Veena, 2018). These labor pools allow investment in generating incremental innovation, which is labor-sensitive. On the other hand, leading pharmaceutical firms are relocating their clinical trial activities to India and other developing countries. The approach is understandable given their ample benefits, such as a vast pool of patients, low set-up costs, the availability of qualified experts and massive business opportunities. It is a place for clinical trials that cost around one-tenth of a United States clinical trial (Mondal & Abrol, 2015).

4.1.3 Widespread usage of IT. Recently HSCM has experienced systemic shifts in the healthcare delivery structures, leading to the ongoing usage of information system/information technology. Healthcare organizations have started using customized high-end hardware and software for billing, patient scheduling and medical recording. Integrating this

system with SCM can make the process more convenient and user-friendly (Afshan & Sindhuja, 2015). Implementation of information and communication technology (ICT) can improve healthcare services in private hospitals and increase patient satisfaction (Agarwal, 2017). One of the prominent examples is the use of radio frequency identification (RFID) to identify counterfeit drugs. Science and technology play a significant part in the battle against counterfeiting (Islam & Islam, 2022). RFID technologies and copy radio waves of the nuclear quadruple resonance spectrum can be used to recognize solid materials' chemical composition and overcome counterfeit drug problems (Haji, Kerbache, & Al-Ansari, 2022). Furthermore, the regulatory authorities and the players are implementing several schemes linked to the recording and maintaining of electronic medical records, mobile health services and telemedicine in a big way across the country (Mohiuddin *et al.*, 2017).

4.1.4 Strong interpersonal relationship. In the face of rapidly spiraling prices, hospitals face intense pressure to offer expanded access to high-quality services. Consequently, cost management has been one of the significant challenges for the pharmaceutical industry (Benarbia & Kyamakya, 2022). Network partnerships that provide ample opportunity to develop partnerships between patients and providers are considered an essential strength of the Indian pharmaceutical industry to maintain SCM and reduce costs (Chakraborty, 2018). On the other hand, strong interpersonal skills in procurement, leadership development and supply manager training are vital to establishing an effective SCM system (Zenkevich & Kazemi, 2020). Supply chain managers are concierge who forms strategic buyer-supplier relationships, offer resources to internal buyers and vendors and coordinate supply chains of content and information flows.

4.1.5 Reverse logistics approach. Reverse logistics involves the process of preparing, developing, conducting and controlling the profitable and efficient stream of any undesirable or unhealthy drug or its formulation and linked information from the point of use to the origin point to prevent any potential harm, recovery value or appropriate disposal (Abbas, 2018). Due to unavoidable challenges such as exponential growth in customer expectations, competitive pressures, a wide range of products and the need for continuous efforts to win customer satisfaction, an efficient reverse logistics process has become essential for revitalizing value. In the Indian pharmaceutical industry, the continued prevalence of expired and low-quality medicines has been linked to the marketplace influx of unwanted products leading towards a negative impact on SCM as well as health hazards. Along with the reverse logistics approach in improving pricing and regulatory policies, increasing customer understanding of medicinal usage and cooperative procurement of therapeutic goods have been recognized as steps to increase competitiveness and efficiency among players and mitigate market floods with low-quality medicine (Abbas & Farooquie, 2020).

4.2 Weaknesses

4.2.1 Procurement risk. Over the past few years, concerns with the quality of material have drifted, giving rise to batch failures, slowdowns in manufacturing and a shortage of available resources all over the industry. On the other hand, inadequate quantification, fraudulent procurement procedures, tendering practices and poor financial management and payment are some of the major issues faced during the procurement process in different Indian hospitals (Endo & Kamei, 2022; Singh, 2019). This often results in a shortage of medicine that interrupts the process of providing high-quality healthcare.

4.2.2 Multiple manufacturing amenities. In today's business world, any industry's ability to manage and combine complex relationships with suppliers and customers is critical to its success. Intense global competition has compelled organizations to have a close and incorporated relationship between manufacturers and supply chain partners to ensure a well-integrated supply chain system. However, because India's economy is so fragmented,

integrating the different activities that make up its supply chain is complex. The involvement of several policy agencies with partly split roles between core and provinces culminated in a proprietorship crisis (Radwan & Farouk, 2021).

4.2.3 Complex and unequipped distribution network. Interruptions in distribution and inventory scarcities have become a regular phenomenon in the Indian pharmaceutical SCM. The critical factor behind this matter is the highly decentralized distribution system, inadequate warehouses and various drug transport requisites, including the cold storage facilities and the augmentation system (Bolineni, 2016). Poor infrastructure, the absence of efficient records monitoring systems, scarcity of warehouses and clinics with no safe storage room have rendered the material processing and delivery network more disruptive (Singh, 2019). Inadequate indenting processes, uncoordinated inventory management and material processing are frequently confused within SCM (Kokilam, Joshi, & Kamath, 2016). Additionally, Wendt *et al.* (2018) found that officials and storekeepers fail to maintain buffer stocks or extra stock retained to minimize stock-outs between purchases, resulting in medicine shortages among rural patients. Even in the case of vaccine, inadequate stock control, insufficient planning and cold chain delays often causes vaccine wastage and create a high risk of health hazard (Chandra & Kumar, 2019). The inadequate storage options are yet another significant flaw in the distribution process. Moreover, insufficient transport facilities and weak road and rail services are other challenges in distribution networks (Dwivedi & Pradhan, 2017; Singh, 2019).

4.2.4 Long lead time. One of the most critical shortcomings of the Indian pharmaceutical SCM is the long lead time. This includes time for new product development, competency acquisition, procurement, manufacturing, delivery, regulative process and cash-to-cash cycle time. The long lead times reduce the reliability and responsiveness of the PSC capabilities and may degrade PSC's agility and market share and increase total costs (Moosivand, Ghatari, & Rasekh, 2019). Due to the extended shipping period, several studies have reported significant scarcity (stock-out) of medicines such as folic acid in different levels of healthcare institutions such as hospitals, community health centers, primary health centers and sub-centers. As a result, a vast Indian population remains underserved (Kumar & Kumar, 2014).

4.2.5 Quality issue. Accessibility, availability, the standard of medicines and other medical equipment are the key factors influencing the provision of adequate health care among the rural population. However, shortage and substandard treatment quality is India's primary concern (Kokilam *et al.*, 2016). There is also an increasing occurrence of pharmaceutical recalls, reports of counterfeit products and problems relating to insufficient supply in foreign and domestic markets. India's issue with counterfeit medicines has contributed to negative worldwide publicity. Illegally manufactured, diverted, counterfeited, or adulterated products have quicker exposure across the black market to the delivery network. People often buy loose tablets instead of complete strips. As a result, neither barcode solution nor hologram and other methods like this fit here. The Indian Ministry of Health assessed that 5% of India's medicines are counterfeit, whereas 0.3% are spurious. In the US$5 billion Indian pharma market, 20% are false medicines (Singh & others, 2017). Moreover, no successful steps exist to battle the country's counterfeit medicine drug cartel system. The healthcare industry stakeholders had to operate among themselves under an authenticity-deficit relationship (Pandey & Litoriya, 2021).

4.2.6 Certification and handling issues. International pharmaceutical companies established firmer legal grounds for launching new medicines in India. Besides, today's fast-changing laws and legislation fuel the demand from regulatory affairs practitioners to meet the industry's current needs of international markets to successfully introduce their drugs to the pharmaceutical market (Senthil, Baviya Priyadharshini, Ramachandran, Ganesh, & Shrivastava, 2015). However, there is insufficient coordination with the international accreditation program for Indian organizations and a uniform national accreditation framework. These constraints on certification serve as an obstacle to international trade

(Afshan & Sindhuja, 2015). Because of this incoherence, a regulatory mechanism has become more challenging, and it may require a year or more to approve new products for marketing.

4.2.7 Lack of expert workforce. India's healthcare industry provides for a growing population, and the business is expected to expand above previously estimated levels of 10–12%. But, recent studies show a massive shortage of qualified healthcare executives and supervisors employed with clinics, pharmaceutical firms, health insurers, third-party management and other healthcare providers (Sharma, 2020). For example, stores are one of the hospital's most important units. It carries out essential tasks, including purchasing, obtaining, inspecting, warehousing, storing, billing and delivering equipment and services to all hospital departments. Thus, stores in charge must be well acquainted with accounting or instructed for the same purpose (Kataria, Saini, & Gupta, 2020).

4.2.8 Lack of training facilities. The majority of the pharmaceutical organization did not provide enough training and knowledge-sharing programs for their employees. Studies showed that storekeepers did not undergo instruction in stock management (Wendt *et al.*, 2018). Gaps in pharmacy education and training and lack of resolution on pharmacist roles pose challenges in health services. Additionally, most people in the PSC have little knowledge about e-medicine SCM (Afshan & Sindhuja, 2015). Besides, many staff feel reluctant to use information technology (IT) systems for data management due to a lack of knowledge and skill. They also fail to choose the right technology platform resulting in a disastrous effect (Kokilam *et al.*, 2016). Additionally, mainstream pharmaceutical companies and hospitals in India are still lagging in applying the green supply chain management (GSCM) model. Because of that, companies would have to answer concerns on the ecological aspects of their development practices and supply chain, their carbon emissions and the recycling process, which seems to be an additional weakness that needs to be sorted out in the future years (Sharma, 2020). The COVID-19 pandemic highlights the value of awareness, preparation, capacity building and infrastructure growth in India for Emergency Preparedness & Response (EP&R) (Meghana, Aparna, Chandra, & Sanjeev, 2021).

4.3 Opportunities

4.3.1 Population growth. India is predicted to overshadow China as the most populated country in the world over the next decade due to an even higher fertility rate. India will be a home for around 1.5 billion citizens by 2025 (Samir, Wurzer, Speringer, & Lutz, 2018). Consequently, the patient population will grow by more than 20% over the next ten years. This will result in a growing demand for treatment and medication, which poses an outstanding opportunity for the Indian pharmaceutical industry (IBEF, 2020). Moreover, the demographic trend in the growth of the senior population represents a large customer pool providing a demand for innovations for curative, preventive and geriatric treatment. On the other hand, because of a genetically diverse population and the abundance of trained physicians, the Indian pharmaceutical industry market has the potential to attract significant investment for clinical trials, which serves as an additional opportunity.

4.3.2 Increased prevalence of lifestyle-related illnesses. Along with communicable and infectious disorders, there is likely to be a more significant cardiovascular disorder, oncology and diabetes (Falkingham, Qin, Vlachantoni, & Evandrou, 2017). This transition in customer dynamics sheds light on a new frontier to incorporate an evolving area of therapeutic profile for top pharma companies. Due to this rapid population increase, the emergence of both communicable and non-communicable disorders and economic advancement, the demand for pharmaceutical drugs has expanded several folds. Therefore, India's pharmaceutical sector has developed into a leading global trading company with tremendous potential.

4.3.3 Global trade potential. Referring to the policy the Ministry of Commerce and Industry reported, India is now looking for potential prospects as a market leader in manufacturing

brand-name generic drugs (Mohiuddin *et al.*, 2017). Regarding pharmaceuticals, India respectively holds the third and sixth positions in the global market regarding growth and size. It is among the Indian economy's fastest-rising industries. The Indian pharmaceutical industry is expected to develop at a compound annual growth rate of 15.92% to US$55 billion by 2020 and is projected to continue in the coming years. Thus, if India's state-of-the-art logistics infrastructure is successfully built, India's share of the global pharmaceutical industry could grow even more (Parmata, 2016).

4.3.4 The emergence of new technologies in HSCM. The healthcare industry is a knowledge-intensive market. The technology has quickly improved the standards for doing business internationally with the potential to deliver prompt, precise and credible details (Kokilam *et al.*, 2016). The recent advancement of IT has created enormous opportunities to improve SCM's effectiveness and reliability, which includes a cloud-based micro health center. A typical shipping container can quickly transform into a micro health center using cloud technologies. It can be conveniently delivered by any truck that can be used to return to healthcare facilities during a crisis like a disaster or war. Additionally, blockchain technology is another new technology that has immense potential to be used in HSCM is the blockchain technology (Khezr, Moniruzzaman, Yassine, & Benlamri, 2019). This process makes it extremely easy to collect information for medical logistics requirements from the manufacture of medicines to the service user on the blockchain network. If fake medicine tries to invade the network at any point, it will be automatically identified and further invasion will be prevented (Pandey & Litoriya, 2021).

4.3.5 Purchase in alliance. Community partnerships effectively lower healthcare expenses as they minimize the drug's price, particularly medical supplies and pharmaceutical products (Chakraborty, 2015). For example, TUV Rheinland's Indian subsidiary has partnered with Andhra Pradesh MedTech Zone (AMTZ) to establish an Electro-Magnetic Interference (EMI/EMC) facility over the four-to-five-year period for a total investment of US$12.64 million. Besides, Dr Reddy's Laboratories collaborated with Japanese pharmaceutical leader Fujifilm Toyama Chemical and Global Response Aid (GRA) in 2020 for the production, manufacture and selling of antiviral medication Avigan (favipiravir) tablets for possible COVID-19 treatment providing enormous prospects for the future pharmaceutical field (IBEF, 2020).

4.3.6 Wide range of adaptive policies for sustainable inventory management. The PSC comprises many supply chain parties, such as principal manufacturing plants, delivery centers, wholesalers and hospitals. The interrelationships among these elements and the resilience of generic drugs need advanced strategies for managing the supply chain (Sbai & Berrado, 2018). Pharmaceutical companies are fastidiously searching for innovative ways to achieve additional benefits in inventory management. Several new policies have been formulated to make the different phases of SCM easier. One of them is periodically-affine policies, which allow decision-makers to efficiently monitor and regulate large-scale newsvendor networks in the face of volatile demand without needing delivery forecasting (Bandi, Han, & Nohadani, 2019).

4.3.7 Rise in disposable income. In India, the disposable income is projected to increase for households was INR 200,000 per year, from 14% in 2009-2010 to 26% in 2014-2015. Increased earnings will push 73 million households into the middle class over the next ten years, making healthcare more affordable. This growing trend provides tremendous potential for the healthcare sector for the open market. Also, it raises high-end consumer demand generating more enormous business opportunities (IBEF, 2020).

4.4 Threats

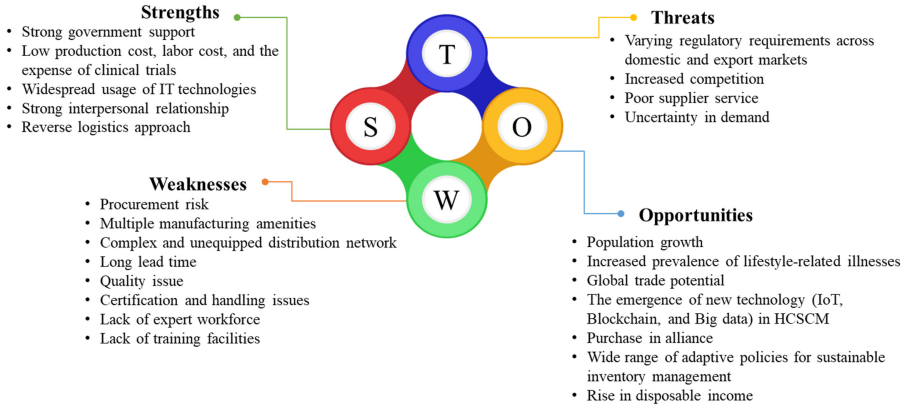
4.4.1 Varying regulatory requirements across domestic and export markets. Procurement and transferring drug management involved addressing current regulatory frameworks. In India, various laws regulate the flow and sale of medicine around the region, creating complexities

for SCM. The policy sets prescription costs and the state government implements various drug pricing programs for multiple forms of medication (Berndt & Cockburn, 2014). This kind of regulation of activities sometimes negatively impacts the supply chain process. A variance in specifications and requirements, on the other hand, increases the expense and uncertainty of export markets. For example, Indian Pharma is now experiencing a growing onslaught of multinational companies' litigation in the US and Europe opposing their drugs on the grounds of product patent rights infringements. Also, the Trade-Related Aspects of Intellectual Property Rights (TRIPS Agreement) stipulation made it overbearing for the Indian pharmaceutical companies to launch their R&D or face the challenge of being limited to having just off-patent drug suppliers (Alenina, Bengoa, & Vlasova, 2016).

4.4.2 Increased competition. Competition is a topic that is always relevant to health care discussion and pharmaceuticals are no different. Over the past five to ten years, several markets have seen steady growth, including China, Germany, Brazil, Italy, etc. Currently, several products with identical characteristics, bioequivalence and price ranges are commercialized by several multinational companies (Garattini & Padula, 2018). This increasing competition and the emergence of new competitors represent a significant threat to the pharmaceutical industry in India.

4.4.3 Poor supplier service. In terms of APIs, Indian pharmaceutical companies extensively depend on China. Around 70% of the total raw material is imported from China. Therefore, it creates considerable uncertainty and vulnerability to disruption in the SCM, especially during the global crisis. This problem became acute when China was locked to seek to stop the COVID-19 disease. Pharmaceutical firms and the Government of India are deeply worried about the insecurity of the Indian PSC (Chatterjee, 2020).

4.4.4 Uncertainty in demand. The heterogeneity of customers leads to substantial volatility in drug demand (Vishwakarma *et al.*, 2019). Pharmaceutical settings are typically highly diversified in the real world, with numerous products and decision-making phases. It becomes more crucial for the vendors due to these uncertainties in demand. For online pharmacy services, significant fines are sometimes imposed when consumer demand is unmet (Bandi *et al.*, 2019). Thus, it acts as a potential threat to retailers. A summary of the SWOT analysis is exhibited in Figure 1.



Source(s): Figure by authors

Figure 1.
HSCM SWOT analysis

5. SWOT analysis strategies

5.1 SO strategies

Strength-Opportunity (SO) strategies are employed to capitalize on internal strengths while taking advantage of external opportunities. Therefore, more efforts should be attempted by the government. Investing in local infrastructure and establishing a robust IT network would guarantee lower operational costs and optimize benefits. Besides, practical usage of the reverse logistics strategy would enable industries to increase their disposable income through unnecessary wastage and unwanted products (Abbas, 2018). Additionally, an adaptation of the GSCM model will not only reduce environmental pollution but also reduce cost and provide an additional competitive advantage to the pharmaceutical industry.

5.2 ST strategies

By leveraging internal strengths to avoid the effects of external threats, the industry should formulate a single regulatory requirement to ensure the product's quality and safety. Additionally, the government should encourage and leverage stakeholders to become domestic suppliers, reducing the risk of raw material supply shortages during a crisis (Ghosh, 2019). Using the low labor cost facility and a wide variety of clinical trials, new therapeutic products should be introduced alongside a cost leadership approach to build product differentiation. Likewise, short marketing authorization should be adopted in collaboration with the government to speed up marketing and acquire first-mover benefits.

5.3 WO strategies

To strengthen the internal vulnerabilities and leverage external opportunities, it is recommended that SCM of the healthcare industry invest in an automated network to accelerate data structuring, processing and information flow. IoT and blockchain technologies will make the HSCM system more visible, reliable and effective. It will integrate the fragmented SCM system and thus more safely and efficiently combat issues like counterfeit and shortage of medicine (Pandey & Litoriya, 2020). This will ensure accessibility, visibility and transparency of the information flow resulting in continuous tracking of SCM system performance. It will also improve financial performance by reducing operating and administrative expenses. Therefore, it will safeguard premium health services via a sustainable and integrated SCM system (Ling & Wahab, 2020). On the other hand, partnerships and the online exchange of expertise and knowledge between pharmaceutical community organizations and departments of public health will propagate the process of information flow among the SCM. Moreover, the training arrangement will also create expertise which will promulgate them to work more efficiently. Additionally, adaptation and standardization of a unified policy would rule out regulatory and quality problems.

5.4 WT strategies

Defensive strategies are suggested to minimize internal weaknesses and avoid potential external threats. Therefore, a standardized standard operating procedure (SOP) should be constructed to prevent the issues of various regulations and substandard counterfeited drugs. Especially for procurement policy, state procurement policy can be adopted and strictly maintained to ensure a sustainable supply chain. Instead, to ensure uninterrupted distribution, investment in IT, establishing local infrastructure and a faster clearance approach in using assets will reduce the SCM cycle as an analog with optimal reduction of operating costs. The correct distribution of goods and resources through both departments and vendors will continue to eliminate the bottlenecks and the expenses of the stakeholders concerned, thereby helping to treat patients at a reduced expense (Afshan & Sindhuja, 2015).

Therefore, the establishment of an integrated SCM can ensure the maximum efficacy of SCM with little cost. Table 1 displays the SWOT matrix summary of the HSCM environment of the pharmaceutical industry.

6. Conclusion

Indian pharmaceutical industry has grown over the last few years and the business plays a crucial role in the country's economic development and social welfare. India is undergoing a critical transition as a global pharmaceutical competitor. Although the industry has courageously undertaken an expansion route that aspires to become a hub for low-cost

Strength (S)	*Weakness (W)*
1. Strong government support 2. Low production cost and labor cost 3. Widespread usage of IT technologies 4. Strong interpersonal relationship 5. Reverse logistics approach	1. Procurement risk 2. Multiple manufacturing plants 3. Complex and unequipped distribution network (Storage, transport, stock keeping) 4. Long lead time 5. Quality issue 6. Certification and handling issues 7. Lack of expert workforce 8. Lack of training facilities 9. Delayed adoption of the GSCM model

Opportunities (O)	*SO Strategies*	*WO Strategies*
1. Population growth 2. The growing trend of lifestyle-related disease 3. Global trade potential 4. The emergence of new technology (IoT, blockchain and big data) in HCM 5. Purchase in alliance 6. Wide range of adaptive policies for sustainable inventory management 7. A rise in disposable income	1. Increasing attempts by Government for market acquisition. (S1; O1, O2, O3) 2. Cost optimization and profit maximization approach (S2, S3, S4; O4, O5, O6) 3. Best usage of reverse logistics technology to increase disposable income. (S5; O7) 4. Adoption of GSCM model (S1, S2, O3)	1. Usage of innovative IoT-based blockchain technology to establish a strong SCM network (W1, W2, W3, W4, W5, W8, W9; O4) 2. Adaptation and standardization of unified policies (W6; O6) 3. Online knowledge sharing and training program (W7, W8; O4)

Threats (T)	*ST Strategies*	*WT Strategies*
1. Varying regulatory requirements across export markets 2. Increased competition 3. Poor supplier service 4. Uncertainty in demand	1. Formulation of a single regulatory requirement in collaboration with govt. (S1, T1) 2. Encourage and promote homegrown producers (S1, S2, S3, S4; T3) 3. Product differentiation and cost leadership approach (S1, S2, S3,4, S5, T2, T4) 4. Short marketing authorization (S1, T2)	1. Construct standard SOP and follow state procurement policy (W1; T1) 2. Greater efficacy in tech transformation and cost reduction (W7, W8; T2, T3) 3. Faster line clearance and readiness to reduce asset use (W3, T4) 4. Improve quality and compliance with a standardized process. (W5, W6, W9, T1, T2) 5. Establishment of an integrated sustainable SCM (W1, W2, W3, W4, W5, T3, T4

Source(s): Table by authors

Table 1. SWOT matrix of the HSCM environment

production and R&D, they still face a complex collection of local and global obstacles that generate tremendous pressure on SCM. Moreover, environmental complexity, knowledge gap and limited research source made the condition more challenging to comprehend. This study was therefore performed to identify, evaluate and prioritize the strength, weaknesses, opportunities and threats to the pharmaceutical industry's environment and to analyze best practices through SWOT analysis. The findings summarized in Figure 1 synchronized with the other studies on different sectors of HSCM (Singh & others, 2017). Thus, Indian pharmaceutical firms need to redesign their procedures and frameworks. Figure 2 illustrates the suggested mitigation framework based on this study's findings.

It is developed based on proactive and reactive strategies. The aggressive strategy includes supply management via the collaborative effort of government and stakeholders by setting a SOP based on state procurement policy, local investment, transportation and workforce development. At the same time, demand management includes strategies to develop industry regulations and policies towards introducing strong product differentiation and cost leadership. Moreover, effective adoption and utilization will ensure proper information flow and reliability and reduce the cost and time of the SCM cycle. Concerning product management formulation, a unified policy to ensure competence and quality of product will resolve the issue of counterfeited medication, industry shutdown and banning of pharmaceutical companies. Comparable, the reactive strategies require re-designing the fragmented SCM and integrating all the processes. SCM needs to be integrated, well-designed and sustainable to ensure maximum efficacy. Only then cost and profit maximization would be possible to achieve. Furthermore, a contingency plan for sudden SCM disruption and the development of EP&R will safeguard the sustainability of the PSC system. This significant transition would involve dedication from top management, combined with a practical implementation team that will help support the effects. Therefore, it is anticipated that the implementation of these strategies will embark on a positive impact on the HSCM environment in India.

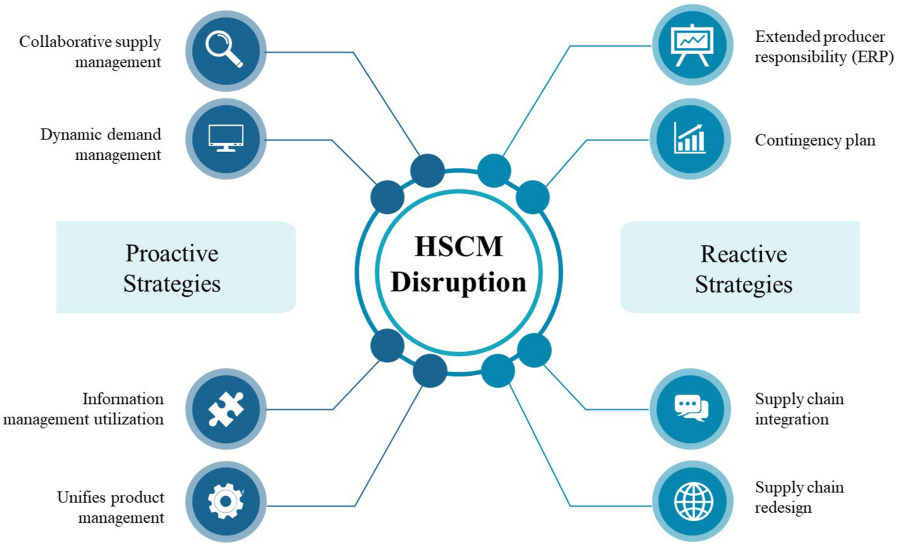


Figure 2.
HSCM mitigation strategies framework

Source(s): Figure by authors

6.1 Research implications

This research is among the few to combine SWOT analysis and the HSCM environment of the pharmaceutical industry. Therefore, this paper would add importance to ongoing SWOT-based academic work. Besides, it would reduce the knowledge gap and enhance the perception of the pharmaceutical industry, not just in India but internationally. This paper would act as a roadmap to greater comprehension of the market leaders and their operating climate. Moreover, implementing the proposed methods effectively would increase the supply chain network efficiency and profitability for on-time delivery and reduce the company's operational costs (Babazadeh & Sabbaghnia, 2018). This study can impact social transformation by helping healthcare institutions to make sure essential medicines are available to patients at the time they need them. The research findings may also alter how individuals understand medical organizations involved in providing medicinal products for their treatments.

6.2 Limitation and future research

Because this is one of a few studies to look into SWOT analysis in the HSCM in India, one of the study's limitations is the extremely subjective conclusions. Based on the author's observations in the industry, the identified SWOT has been highlighted. A quantitative SWOT analysis should be conducted in future research. An empirical investigation would support the importance of the subjective aspects discussed in this work. Furthermore, because the pharmaceutical supply chain is always evolving, the findings of this article should be used as a parameter as the highlighted internal and external components may alter in the future. Hence, future studies should concentrate more on systematic and comprehensive empirical studies. More effort is needed to fully understand and unearth other pertinent or unseen SWOT that surround India's pharmaceutical industry. As a result, the report suggests that future empirical studies using focus groups or panel interviews be conducted to gain more comprehensive insights into the total understanding of the pharmaceutical supply chain. Despite the report's limitations, especially in light of India's lack of pharmaceutical supply chain research, the qualitative technique utilized in this work further supports the feasibility and relevance of SWOT analysis for exploratory study. Additionally, the management of the HSCM is a dynamic process and the strategies differ from one to another. Thus, future studies may use the same criteria to carry out more country-specific or type-specific such as life-saving machines and surgical equipment. To improve the efficiency and reliability of HSCM, it is vital to pay more attention and focus on related issues such as staff and client recruitment, drug tracking and accessibility, cold chain control, human resources (HR) procedures, healthcare supply chain (HSC) risk reduction and waste management, EP&R during pandemics and disasters, usage of IoT based, blockchain and chatbots in healthcare.

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