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THE IMPACT OF SUPPLY CHAIN DRIVERS ON THE PERFORMANCE OF MINISTRY OF HEALTH PHARMACIES IN JORDAN

Abstract

For most companies, supply chains have become the most crucial factor in their competition rather than individual competition, enabling any company to gain a competitive advantage against another organization through efficient and effective supply chain management. Supply chain drivers have become one of the most critical potential valuable access to a competitive advantage by enhancing and improving organizational performance. This study aims to explore the impact of the drivers of the supply chain on the performance of pharmacies of the Ministry of Health in Jordan. The study used the descriptive analytical approach and simple random sampling. 300 electronic questionnaires were designed via Google Sheets and sent via email and social media to employees in the Jordanian Ministry of Health pharmacies. The study retrieved 252 questionnaires valid for analysis. SPSS was employed to analyze the data and test the hypotheses. The results showed that the Beta-value is 0.849, T-value is 25.370, at a significance value of 0.000, which means that supply chain drivers affected the Ministry of Health pharmacy's performance. The estimated regression equation means that any one-unit increase in the level of supply chain drivers will lead to an increase in Ministry of Health pharmacies' performance by 0.789. Furthermore, the performance of the supply chain drivers was moderate, and the general performance was high. The study recommended that pharmacies focus on employing software and modern technology in inventory control.

Keywords

facilities, inventory, transportation, sourcing, internal process, satisfaction, Jordan

JEL Classification

M10, M12, M30

INTRODUCTION

Supply chain drivers become a possible way to a competitive advantage for organizations by improving their performance. The importance of supply chain drivers comes from their role in enhancing the effectiveness and efficiency of organizations, which affects their growth and success. Many supply chain drivers recommend creating value for customers, with logistics, transportation, inventory management, service management, information distribution, pricing, and procurement as one of the most critical drivers. Good management of these drivers could enhance business performance (Shahzadi et al., 2013). According to Lummus and Vokourka (1999), many organizations follow several steps in supply chain practices, such as the information distribution system, job adoption, and integration between the supply chain and enterprise strategy. Hamdan (2019) indicates setting objectives for the supply chain and the relationship with both suppliers and customers through logistics management, which leads to integration between the supply chain strategy and the enterprise strategy and thus increases the performance.

The Jordanian Ministry of Health plays a significant role by supplying all of Jordan's hospitals and medical centers with medications, medical and non-medical consumables, and medical devices. This significant role is done by the Directorate of Purchase and Supply, which is trying hard to ensure the efficiency of the supply chain. Despite that, it faces many challenges to ensure this efficiency. These challenges are summarized (from the research observation and practical experience) as a delay in the delivery from some of suppliers, over inventory of hospitals and medical centers, and delay in the transportation from the Directorate to hospitals and medical centers.

During the past two years, the Jordanian Ministry of Health faced an unexpected challenge due to the coronavirus pandemic, which generated a massive increase in service demand. The government committed to treating all the coronavirus cases at its own expense. This situation created a need to build four new field hospitals across the country, which affected the whole supply chain drivers of the Jordanian Ministry of Health (WHO, 2021). The problem statement of the study was identified by reviewing the previous research related to supply chain drivers and organizational performance (Chand et al., 2022; Rana & Osman, 2018; Viet et al., 2018; Al Draj & Al Saed, 2023; Chopra & Gupta, 2020). All of those previous studies focused on developing a model for studying the efficiency of the supply chain and performance; this study seeks to contribute new evidence to this topic.

1. LITERATURE REVIEW

The improvement of business organizations' performance comes through supply chain drivers becoming a potential method for their competitive advantage. The supply chain drivers can enhance the effectiveness and efficiency of organizations or lead to their growth. The good management of the most critical components of performance management engines lies in logistics services, transportation, inventory management, service management, information distribution, pricing, and procurement, which establishes customer value and enhances business performance (Shahzadi et al., 2013).

According to Lummus and Vokourka (1999), at the basic level, the supply chain management system can be defined as managing the flow of goods, money, and information related to a service or commodity, purchase of raw materials and the delivery of the product to the final consumer. It links supply chains and logistics, which include digital supply and related software packages. This leads to cooperation between various parties to produce a good or service, fulfill orders, and follow up with suppliers, manufacturers, wholesalers, and retailers (Hamdan, 2019).

Facilities are vital for supply chain management. Businesses should keep adequate quantities of assets in stores or warehouses near the point of use, provided such warehouses have suitable storage methods for stored materials and the type of maintenance

of all assets. Moreover, they should keep appropriate quantities of items; if the quantity is low, the processes can stop; if the quantity is too much, inventory increases, storage costs increase, and the number of defective items increases (Al-Awamla, 2018). Inventory is often one of the most significant assets a company has; poor inventory management is one of the major causes of small business failure. Ineffective inventory management can reduce profitability in several ways. If a company is slow to adapt to changing market demands, customers will look elsewhere and give up market share and less inventory (Byrne, 2010). Transportation is the variety of terms associated with moving inventory or goods through the supply chain. It can make it problematic to deal with for the first time. Knowing the most important types and methods of transporting goods and their associated terminology is crucial, as well as ensuring that the goods arrive on time and in good condition. If a company is in a hurry or unsure of its options, it will speak to a professional freight forwarder; it can clear up much confusion (Peng Wong & Yew Wong, 2021). Management should understand a picture of demand and the balance of all items in the warehouse, determining the minimum and maximum limits and the economic quantity of the order. They must provide the financial department with the information and aspects of use required for the financial settlement, recording the balance of the actual store at the end of the year, and comparing it with the balance. Moreover, it is crucial to identify the difference and provide any data the different departments may

request, such as an idle balance table, inventory, or price list (Al-Awamla, 2018).

Supply chain operators (drivers, technicians, managers, and employees) must be able to analyze data and processes, find creative solutions, generate reports and present findings to senior management and other departments, communicate with external suppliers and buyers, understand legal documents, and develop lasting relationships with others. In addition, they play an active role in developing and maintaining good relationships with the company's suppliers and distributors (Peng Wong & Yew Wong, 2021).

Supply chain coordination also plays an essential role in the development process, from the company that intends to carry out development operations on the new product to the delivery of the product in its final form. Supply chain managers influence the company to formulate what is needed by providing the expertise they possess, to increase productivity, efficiency, and safety. Coordination also affects all aspects of the manufacturing process. Candidates for the position of supply chain manager must have strong communication skills and a passion for working with others (Tomic & Brkic, 2019).

The performance consists of two main elements: efficiency and effectiveness. Efficiency is the value of resources used to produce a product unit. Thus, it is the thought of rationally using the available human, material, and financial resources and information (Bataineh et al., 2015). Effectiveness is an indicator of the extent to which goals are achieved. It focuses on the goals set by the organization and the extent to which they are achieved, in addition to improving its internal operations and obtaining scarce resources from the environment in which it operates (Abdallah & Alkhalidi, 2019). According to the World Health Organization (2021), it is the complete state of physical, mental, and social well-being of a person, not only the absence of disease or infirmity, which is a human right and a fundamental right of society, a means to achieve its slogan "Health for All." Hence, the lack of high-quality medical preparations, the lack of trained professional health capabilities, and the low level of health education are highlighted as significant challenges of pharmaceutical services.

Xiong et al. (2022) examined the impact of dual supply chain drivers. Chand et al. (2022) aimed to verify

the impact of the factors driving the complexity of the supply chain (upstream, operation, complementary, and external) on the operational performance of companies. Rana and Osman (2018) studied the effect of supply chain drivers (information technology for a supplier, inventory management, transportation, and coordination) on the performance of the supply chain. Viet et al. (2018) provided an organized overview of the information values in the various supply chain decisions.

Chopra and Gupta (2020) developed a model to examine the impact of knowledge management practices (knowledge sharing culture, knowledge-based human resource management, strategy and leadership, information and communication technology) on organizational performance using the four balanced scorecard results. Tomic and Brkic (2019) researched the impact of ISO quality improvement requirements. Musanzikwa and Ramchander (2018) investigated the factors of organizational culture influencing the supply chain performance in state-owned companies (efficacy of achieving goals of finance, customer satisfaction, internal business processes, learning and growth). Al-Taweel and Al-Keeki (2009) examined the impact of distribution activities on the organizational performance of the Nineveh company that manufactured medicines and medical supplies. Supply chain management affects the performance of industrial companies in the Kuwait Inventory Exchange. Logistics management impacted the quality of services provided by the nutrition departments in private Jordanian hospitals (Al abadi & Al Saed, 2020).

2. AIM AND HYPOTHESES

Following the literature review, this study seeks to measure the impact of supply chain drivers (facilities, inventory, transportation, information, sourcing, and coordination) at $\alpha \leq 0.05$ on the Ministry of Health pharmacies' performance (customer satisfaction, internal process, and learning and growth) at Jordan. Therefore, the study suggests the following hypothesis as per the research conceptual model (Figure 1).

H01: There is an insignificant impact of the supply chain drivers (inventory, facilities transportation, sourcing, coordination, and informa-

tion) at $\alpha \leq 0.05$ on the Ministry of Health pharmacies' performance (internal process, customer satisfaction, and learning and growth) at Jordan.

The following sub-hypotheses result from the main hypothesis:

H01.1: There is an insignificant impact of the supply chain (inventory, facilities transportation, sourcing, coordination, and information) at $\alpha \leq 0.05$ on the customer satisfaction of the Ministry of Health pharmacies' performance in Jordan.

H01.2: There is an insignificant impact of the supply chain (inventory, facilities transportation, sourcing, coordination, and information) at $\alpha \leq 0.05$ on the internal process of the Ministry of Health pharmacies' performance in Jordan.

H01.3: There is an insignificant impact of supply chain drivers (inventory, facilities transportation, sourcing, coordination, and information) at $\alpha \leq 0.05$ on the learning and growth of the Ministry of Health pharmacies' performance in Jordan.

3. METHODOLOGY

The study adopts the descriptive analytical approach in collecting data and testing hypotheses. The population consisted of 560 pharmacies of the Jordanian Ministry of Health; the sampling unit consisted of 730 pharmacists. Since not all members of the sampling unit had access to the com-

prehensive inventory method, random sampling collected data, and their size was determined using a statistical approach (Sekaran & Bougie, 2016). Therefore, 300 electronic questionnaires were designed via Google Sheets and sent via email and social media. The study retrieved 252 questionnaires valid for analysis.

A questionnaire was designed to cover all dimensions of the study variables, including independent and dependent, in a manner that enables testing the study hypotheses. To enhance the reliability and credibility of the data, this study relied on the measures mentioned in previous studies, which have proven reliability and credibility. The questionnaire consisted of 37 paragraphs to achieve the objectives of the study. Each questionnaire consists of two parts. The first one represents the characteristics of the sample according to demographic information, and the second one represents the dimensions of the variables: supply chain drivers and the performance of the Ministry of Health pharmacies in Jordan.

4. RESULTS

To ensure the validity and reliability between the elements and variables of the study, reviewing the paragraphs of the questionnaire was carried out by nine academic arbitrators from Jordanian and Arab universities in various business administration disciplines, five from Amman Arab University, and four from other universities; all the observations and suggestions of these arbitrators were taken into account. According to Sekaran and Bougie (2016), the value of Cronbach's alpha should be 0.70 for good reliability. The results shown in Table 1 present acceptable levels.

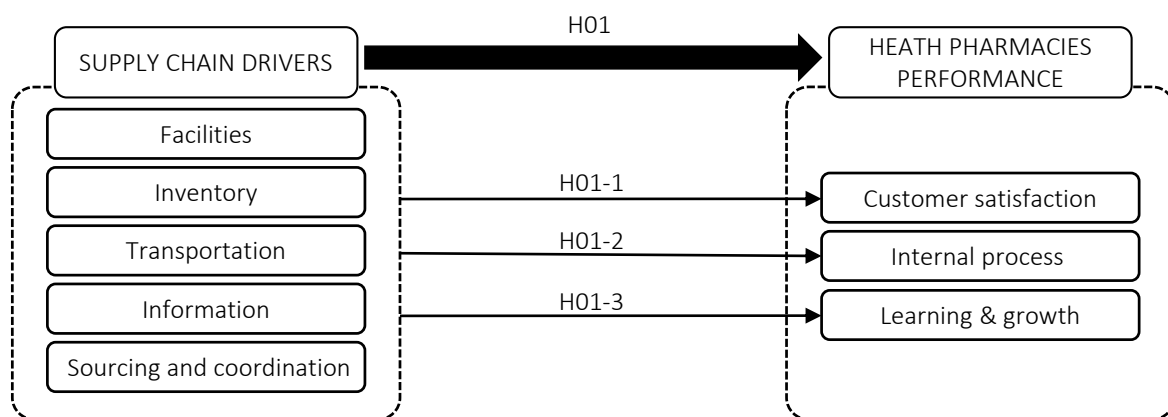


Figure 1. Research model

Table 1. Cronbach’s alpha coefficients

Variable	Paragraphs	Cronbach’s alpha coefficient (α)
Independent variable: Supply chain drivers	37	479.0
Facilities	7	488.0
Inventory	5	238.0
Transport	7	898.0
Information	7	319.0
Sources	6	598.0
Coordination	5	938.0
Dependent variable: Performance of the Ministry of Health pharmacies in Jordan	18	439.0
Customers satisfaction	6	258.0
Internal operations	6	397.0
Learning and growth	6	778.0

According to Table 1, all the values of Cronbach’s alpha internal consistency coefficient for the dimensions and variables of the study were greater than 0.70. Therefore, the study tool had a high stability coefficient, which confirms the validity of its use to achieve the objectives of the study. Cronbach’s alpha values for the dimensions of the independent variable ranged between 0.832-0.913, while it was 0.974 for the independent variable as a whole. Cronbach’s alpha coefficient for the dependent variable was 0.934, and the Cronbach’s alpha values for the dimensions of the dependent variable ranged between 0.793-0.877.

Table 2. Variance inflation factor and tolerance dimensions

Variants	VIF	Tolerance
Facilities	3.231	.309
Inventory	3.526	.284
Transportation	5.394	.185
Information	5.376	.186
Sources	5.524	.181
Coordination	5.188	.193

Table 2 shows that the VIF variance inflation coefficient test for all variables ranges between 3.231-5.394, less than 10, and the tolerance test ranges between 0.181-0.309.

Table 3. Testing H01

M	R	R ²	Adjusted R ²	SE
1	0.849	0.720	0.719	0.4058

Table 3 shows that the correlation coefficient (R) is 84.9%, and the R² value is 72%, which means that

the supply chain drivers interpret 72% of the variance, and other factors explain the rest.

Table 4. Testing H01: ANOVA

M	S. of. Sq	DF	M . Sq	F	Sig.
Regression	106.005	1	106.005	643.630	.000
Residual	41.175	250	.165		
Total	147.179	251			

Table 4 indicates that value F is 643.630, with a significance value of 0.000. Thus, the alternative hypothesis (H01) is accepted, which means that the level of supply chain drivers affects the Ministry of Health pharmacies’ performance in Jordan.

Table 5. Multiple regression analysis of the impact of supply chain drivers on the Ministry of Health pharmacies’ performance

R.Cof	Unst. Cof		St. Cof	T	Sig
	B	St. Error	Beta.		
(Constant)	.917	.113		8.093	.000
Ministry of Heath pharmacy’s performance	.789	.031	.849	25.370	.000

Note: * sig. ($\alpha = 0.05$).

Table 5 shows that the supply chain drivers significantly impact the Ministry of Health pharmacies’ performance. Beta-value is 0.849, T-value is 25.370, at a significance value of 0.000, so the supply chain drivers level has an impact on the Ministry of Health pharmacies’ performance. The estimated regression equation means that any one-unit increase in the level of supply chain drivers will lead to an increase in the Ministry of Heath pharmacies performance by 0.789.

Table 6. Summary of the simple linear regression variance analysis for H01.1

M	R	R ²	Adjusted R ²	St. E
1	0.742	0.550	0.539	0.52462

Table 6 shows the correlation coefficient (R) value between supply chain drivers’ dimensions and customer satisfaction is 74.2%, and the R² value is 55%. Hence, the supply chain drivers interpret 55% of the variance of the customer satisfaction dimension.

Table 7. Testing H01.1: ANOVA

M	S.of .sq	DF	M. S	F	Sig.
Regression	82.468	6	13.745	49.940	.000
Residual	67.430	245	.275		
Total	149.898	251			

Table 7 shows that the F-value is 49.940, at a significant value of 0.000. Therefore, the null hypothesis (H01.1) is accepted. It means that the level of supply chain drivers has an impact on customer satisfaction of Ministry of Health pharmacies' performance in Jordan.

Table 8. Multiple regression of supply chain drivers' impact on customer satisfaction of Ministry of Health pharmacies' performance (H01.1)

Reg. Coe	Unsta. Coef		Stan. Coef	T	Sig
	B	St. Error	Beta.		
(Constant)	1.331	.161		8.245	.000
Facilities	.214	.075	.221	2.873	.004
Inventory	.194	.067	.233	2.900	.004
Transport	.056	.087	.064	.643	.521
Information	.256	.079	.320	3.222	.001
Sources	.178	.081	.221	2.190	.029
Coordination	.272	.085	.313	3.202	.002

Note: * sig. ($\alpha = 0.05$).

Table 8 indicates that the dimensions of facilities, inventory, information, sourcing, and coordination impact customer satisfaction. B-values are 0.214, 0.194, 0.256, 0.178, and 0.272, T-values are 2.873, 2.900, 3.222, 2.190, and 3.202, and the significance values are less than 0.05. This means facilities, inventory, information, sourcing, and coordination affect customer satisfaction. While the dimension of the independent variable (transport) has an insignificant value (0.521), so it has no impact on customer satisfaction.

The prediction equation is as follows: Customer satisfaction = 1.331 + 0.214*facilities + 0.194* inventory + 0.256*information + 0.178*sources + 0.272*coordination. The estimated regression equation means that any increase of one unit in facilities will increase customer satisfaction by 0.214. At the same time, any one-unit increase in inventory, information, sourcing, and coordination will increase customer satisfaction by 0.194, 0.256, 0.178, and 0.272, respectively.

Table 9. Summary of the simple linear regression variance analysis for H01.2

M	R	R ²	Adjusted R ²	St. E
1	.820	.672	.664	.45436

Table 9 shows that the R value between supply chain drivers and the internal process is 82%, and the R² value is 67.2%, which means that the supply chain drivers interpret 67.2% of the variance of the internal process.

Table 10. Testing H01.2: ANOVA

M	S. of. Sq	DF	M. Sq	F	Sig.
Regression	103.773	6	17.295	83.779	.000
Residual	50.578	245	.206		
Total	154.351	251			

Table 10 shows F-value is 83.779, at a significant value of 0.000, so the alternative hypothesis (H01.2) is accepted. This means that the level of supply chain drivers affects the internal process of the Ministry of Health pharmacies' performance in Jordan.

Table 11. Multiple regression of supply chain driver's impact on the internal process of the Ministry of Health pharmacies' performance

Reg.Coeff	Unsta. Coef		Sta.Coeff	T	Sig
	B	St. Error	Beta.		
(Constant)	.944	.140		6.755	.000
Facilities	.120	.065	.122	1.858	.064
Inventory	.164	.058	.194	2.829	.005
Transport	.010	.075	-.012	.138	.890
Information	.111	.069	.137	1.610	.109
Sources	9.322E-5	.070	.000	.001	.999
Coordination	.398	.073	.451	5.412	.000

Note: * sig. ($\alpha = 0.05$).

Table 11 shows that the dimensions of inventory and coordination have a significant impact on internal processes. B-values are 0.164 and 0.398, and T-values are 2.829 and 5.412. It means that the level of inventory and coordination impact the internal process. While the dimensions of facilities, transport, information, and source have no impact on internal processes.

The prediction equation is as follows: Internal process = 0.944 + 0.164* inventory + 0.298*coordination. The estimated regression equation means that any increase of one unit in inventory will increase internal processes by 0.164. In comparison,

any one-unit increase in coordination will lead to an increase in internal processes by 0.298.

Table 12. Summary of the simple linear regression variance for H01.3

M	R	R2	Adjusted R ²	St. E
1	.821	0.674	.666	.54785

Table 12 shows that the R is 82.1%, and the R² value is 67.4%, meaning that facilities, inventory, transportation, information, sourcing, and coordination interpret 67.4% of the learning and growth dimension variance.

Table 13. Testing H01.3: ANOVA

M	S.of. sq	DF	M. sq	F	Sig.
Regression	152.216	6	25.369	84.525	.000
Residual	73.534	245	.300		
Total	225.750	251			

Table 13 shows that F-value is 84.525, at a significant value of 0.000, so the alternative hypothesis (H01.3) is accepted. It means that the level of the supply chain has an impact on the learning and growth of the Ministry of Health pharmacies' performance in Jordan.

Table 14. Multiple regression of supply chain drivers' impact on the learning and growth of the Ministry of Health pharmacies' performance

Regr. Coef	Unsta. Coef		Sta. Coef	T	Sig
	B	St. Error	Beta.		
(Constant)	.312	.169		1.851	.065
Facilities	.171	.078	.144	2.194	.029
Inventory	.221	.070	.217	3.172	.002
Transport	.158	.090	.148	1.744	.082
Information	.122	.083	.124	1.468	.143
Sourcing	.281	.085	.284	3.310	.001
Coordination	.291	.089	.273	3.290	.001

Note: * sig. ($\alpha = 0.05$).

Table 14 shows that the values of facilities, inventory, sourcing, and coordination are significantly less than 0.005, influencing learning and growth. B-values are 0.171, 0.221, 0.281, and 0.291, and T-values are 2.194, 3.172, 3.310, and 3.290 at significant values less than 0.05. It means the level of facilities, inventory, sourcing, and coordination impacts learning and growth. At the same time, the dimension of transportation and information has no impact on learning and growth.

The prediction equation is as follows: Learning and growth = 0.312+ 0.171*facilities + 0.221* inventory + 0.281*sourcing + 0.291*coordination. The estimated regression equation means that any increase of one unit in inventory will increase the learning and growth dimension by 0.171. In contrast, any one-unit increase in inventory, sourcing, and coordination will increase the learning and growth dimension by 0.221, 0.281, and 0.291.

5. DISCUSSION

The results showed that the general arithmetic means of the supply chain drives in the Jordanian Ministry of Health pharmacies was 3.55, which is an average level. This result is due to the interest of the supplying party and its awareness of the importance of providing the necessary infrastructure for the integration of supply chains and linking the various parties with each other. In addition, they are eager to have appropriate facilities equipped according to the instructions and principles to preserve the pharmaceutical products and organize the distribution and delivery places. It is attributed to the continuous control of the supplying party on its inventory of various materials, covering the needs of pharmacies, dealing well with drug needs and inventory, and providing pharmacies' needs promptly. This result is consistent with Manaseer (2017), who showed that Jordanian companies for oil and fuel services apply supply chain practices on average.

The results revealed no statistically significant impact of the two dimensions (transportation and sources) on the performance of pharmacies. The appropriate transportation of the product, therefore, does not directly affect the performance of pharmacies, but may indirectly affect the delay of some orders in the event of any defect. Also, pharmacies always seek to secure their inventories in reserve to avoid any such defect. This result is inconsistent with the findings of Al-Taweel and Al-Keeki (2019), who indicated a correlation and significant influence between physical distribution activities and organizational performance.

The study indicated a statistically significant effect of facilities, inventory, information, sources, and coordination on customer satisfaction in the

performance of pharmacies. Various information and opening formal and direct communication channels contribute to securing these needs and meeting them promptly and without delay. This will create a feeling among the customers that the pharmacies have met their requirements. This result is consistent with Xiong et al. (2022), who indicated that limited inventory capacity has unexpected benefits through data-driven decision-making. Moreover, Viet et al. (2018) found the existence of the value of information in various supply chain decisions.

The findings showed a statistically significant effect for the two dimensions (inventory and coordination) on the internal operations of the pharmacies' performance. Securing the missing ones and avoiding any delay will contribute positively to conducting internal operations, accessing data

on the inventory level, and coordinating between the orders, warehouses, delivery, and receiving departments. This result is consistent with the findings of Rana and Osman (2018), who indicated a role for inventory management and coordination in the performance of the retail supply chain.

The paper also showed that transport and information affect the learning and growth of the pharmacies' performance of the Ministry of Health in Jordan. This does not depend directly on transfer and information on the supplying party, as much as it relies on serious thinking by the pharmacy management in developing employees who are considered the basic building block for improving the performance of pharmacies. This result is inconsistent with the findings of Chopra and Gupta (2020), who indicated that information influences learning and growth.

CONCLUSION

The purpose of this study is to examine the impact of supply chain drivers (facilities, inventory, information, sources, and coordination) on pharmacy performance in the Jordanian Ministry of Health. The study data were collected from pharmacists working in the pharmacies of the Jordanian Ministry of Health. The study proposed a research model developed based on prior literature, and the regression analysis was administered to test hypotheses.

The regression results showed a significant impact of supply chain drivers (facilities, inventory, transportation, information, sourcing, and coordination) on the Ministry of Health pharmacies' performance (customer satisfaction, internal process, and learning and growth) in Jordan. Thus, the management of health pharmacies should be directing supply departments to adopt modern mechanisms to monitor all operations (requesting inventory, managing it, and granting permits for imports).

The study adds value to the literature by examining the impact of supply chain drivers on pharmacy performance in the Jordanian Ministry of Health. The study finds that the independent variable's dimension (transport) impacts customer satisfaction, transportation and information have no impact on learning and growth, and facilities, transport, information, and source have no impact on internal processes. The study also found that the dimensions of transportation, information, and facilities have the most negligible impact on pharmacy performance in the Jordanian Ministry of Health because these pharmacies belong to the public sector and do not affect the cost.

AUTHOR CONTRIBUTIONS

Conceptualization: Omar Halassa.

Data curation: Omar Halassa.

Formal analysis: Omar Halassa.

Investigation: Omar Halassa, Rashad Al Saed.

Methodology: Rashad Al Saed.

Project administration: Rashad Al Saed.
 Resources: Omar Halassa, Rashad Al Saed.
 Software: Omar Halassa.
 Supervision: Rashad Al Saed.
 Validation: Rashad Al Saed.
 Writing – original draft: Omar Halassa.
 Writing – review & editing: Rashad Al Saed.

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