“Impact of organizational culture on healthcare supply chain resilience in Jordan: Moderating role of technology integration”

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IMPACT OF ORGANIZATIONAL CULTURE ON HEALTHCARE SUPPLY CHAIN RESILIENCE IN JORDAN: MODERATING ROLE OF TECHNOLOGY INTEGRATION

Abstract

This study aims to investigate the impact of organizational culture (i.e., rational, hierarchical, and group) on healthcare supply chain resilience (SCR) in Jordan. This paper further examines the moderating role of technology integration on the relationship between organizational culture and healthcare SCR. Cross-sectional research was conducted, and participants were recruited from different hospitals in Jordan. An electronic survey was employed to collect the responses from 304 participants, including senior professionals designated as doctors, nurses, ray technicians, physical therapists, procurement officers, pharmacists, and lab technicians with more than three years of work experience. There was no statistically significant influence of rational culture on healthcare SCR (p-value = 0.156) and an adverse impact of hierarchical culture on healthcare SCR (p-value = 0.030). Group culture had a statistically significant impact on healthcare SCR (p-value = 0.007). Technology integration had an influential moderating influence on the association between rational culture and healthcare SCR (p-value = 0.042) and the association between hierarchical culture and healthcare SCR (p-value = 0.0129). However, technology integration had no moderating influence on the association between group culture and healthcare SCR (p-value = 0.331). The analysis revealed that group culture has an influential impact on healthcare SCR, while hierarchical culture has a negative impact on healthcare SCR. Moreover, technological integration was observed to improve the beneficial influence of rational culture and the negative effects of hierarchical culture on healthcare SCR. However, the technology integration was not observed to moderate the relationship between group culture and healthcare SCR.

Keywords culture, advancement, agility, logistics, healthcare, infrastructure, Jordan

JEL Classification E32, L50, L60, M14

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INTRODUCTION

Supply chain resilience (SCR) refers to the ability to predict, adapt, and recover from disruptions while maintaining normal operations. As global supply chains involve interconnected entities, resilience is critical to ensuring the uninterrupted flow of goods and services (Ivanov, 2021). This has become especially vital as global supply chains face risks from supplier shutdowns, pandemics, natural disasters, and other unexpected events. To enhance resilience, organizations must foster flexibility, visibility, collaboration, and control in their supply chain processes (Novak et al., 2021). A resilient supply chain can identify potential disruptions and risks in advance to proactively prepare for them; swiftly adjust strategies, processes, and resources to mitigate the impact of disruptions; implement recovery plans and actions to resume operations as soon as possible after a disruption; ensure continuity in delivering products or services to customers without significant interruptions (Ivanov, 2021).

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The operations of the supply chain are affected by various industrial issues (e.g., the Brazilian trucking industry), natural disasters (e.g., the Tohoku earthquake in Japan), or machinery breakdown in manufacturing units (Shashi et al., 2020). Healthcare systems are particularly vulnerable to disruptions, as seen during the COVID-19 pandemic, which exposed significant gaps in global supply chains. Shortages of essential protective equipment, medications, and medical facilities have underscored the critical need for resilient healthcare supply chains (Zamiela et al., 2022). In Jordan, hospitals have faced numerous challenges due to the pandemic, highlighting the need for high-quality management focused on meeting patient needs (Alsmairat et al., 2024). Given the increasing complexities of healthcare systems, the integration of SCR into healthcare supply chains is essential for maintaining efficient operations (Li et al., 2024).

Organizational culture plays a pivotal role in shaping how healthcare supply chains manage disruptions. Factors such as rational, hierarchical, and group cultures can influence how effectively organizations respond to disruptions. Moreover, technology integration plays a significant role in achieving this resilience by influencing various organizational cultures (rational, hierarchical, and group). However, the impact of organizational culture on healthcare SCR, especially in Jordan, remains underexplored. Additionally, healthcare services in Jordan are encountering issues such as rising costs of healthcare facilities and difficulties in managing information across organizations and individuals. The advancement of electronic health services is also facing several conflicts that hinder its implementation (Nassoura, 2020).

Agility, collaboration, and situational awareness related to decentralization and resilience may have a significant impact. Importantly, these capabilities have a greater influence on resilience during the pandemic compared to before (Adana et al., 2024). Despite significant advancements in SCR research, the specific influence of organizational culture on healthcare SCR, particularly in Jordan, remains insufficiently studied. The present study aims to explore the impact of organizational culture on healthcare SCR and the moderating role of technology integration in the relationship between organizational culture (rational, hierarchical, and group) and healthcare SCR. The primary objectives of the study are as follows:

- To examine the positive influence of rational culture on healthcare supply chain resilience in Jordan.
- To explore the negative impact of hierarchical culture on healthcare SCR.
- To analyze the positive effect of group culture on healthcare SCR.
- To investigate the moderating role of technology integration on the relationship between organizational culture (rational, hierarchical, and group) and healthcare SCR.

The study will offer insights into how the healthcare system in Jordan can enhance its resilience to face future disruptions. The research questions addressed by the study are:

- How does rational culture influence healthcare SCR in Jordan?
- What is the impact of hierarchical culture on healthcare SCR, and is this impact negative as hypothesized?
- How does group culture affect healthcare SCR in Jordan?
- How does technology integration moderate the relationship between organizational culture (rational, hierarchical, and group) and healthcare SCR?

1. LITERATURE REVIEW AND HYPOTHESES

SCR is among the essential capabilities of the supply chain, considering the increased complexity of managing global operations (Mandal, 2017). Most organizations need resilience to mitigate disruption risks, manage increased complexity, and perform optimally. Therefore, healthcare sector management needs to work on planning resource deployment to sustain the services in times of disruption. In the healthcare sector, SCR is vital for ensuring that medical services remain uninterrupted during disruptions, which can directly affect patient care (Hohenstein et al., 2015). Previous research has traced the origin of organizational culture (Pettigrew, 1979; Hofstede, 1980; Schwartz & Davis, 1981). According to Schein (2010), organizational culture is a significant factor in shaping SCR, particularly in the healthcare sector. It refers to the shared beliefs and values within an organization that guide behavior and decision-making. Organizational culture is understood as the shared values and beliefs that influence how employees in healthcare supply chain management respond to disruptions and work toward resilience.

An important part is played in organizational culture to execute the operation for organizational achievements as it proposes shared values for guiding the employees about the strategic roles (Schilke & Cook, 2015). The rational culture emphasizes efficiency, goal achievement, and performance-driven behavior within organizations. Yunus and Tadisina (2016) studied the impact of organizational culture on the supply chain and concluded that it has a positive influence on the supply chain department. Further, it also revealed that internal drivers such as customer orientation also impact supply chain integration (Yunus & Tadisina, 2016). However, Al-Ma'aitah et al. (2024) evaluated the impact of Arab cultures on long-term supplier-manufacturer relationships with the moderating effect of trust. They found that cultural and trust issues significantly impact long-term supply chain relationships. In healthcare, a rational culture can facilitate resilience by promoting collaboration and knowledge-sharing, which are essential for coordinating responses to disruptions (Schilke & Cook, 2015). Kwon et al. (2016) stated that functional integration and collaboration are facilitated by rational culture via knowledge sharing. Healthcare supply chains are capable of developing strategies for effective risk mitigation for business continuity through increased integration and collaboration (Zepeda et al., 2016). Prajogo and Oke (2016) stated that rational culture adopts collaborative effects and improved coordination to improve resilience development in healthcare supply chain services.

Healthcare organizations need to be highly responsive to environmental changes, considering the challenges and uncertainties in the service environments. Contingencies can only be minimized through the collaboration of different healthcare entities on common values of human relations. Therefore, hierarchical culture is characterized by formal structures, rigid rules, and centralized decision-making. It is characterized by the collective principles that govern coordination across both horizontal and vertical levels within an organization (Cao et al., 2015). A well-built hierarchical culture helps organizations effectively cultivate official routines, measures, and definite decision-making mechanisms. Hierarchical culture reduces the flexibility of the organization to respond to uncertain situations because of enforced conventional practices and rules. Studies have shown that the main focus of the contingency perspective is on informal procedures and structures (Jiang et al., 2016; Yuan et al., 2016). Sufficient flexibility in developing and executing procedures and policies is needed in healthcare supply chain management for successful collaboration integration and cooperation (Birkinshaw et al., 2016). Therefore, in a hierarchical culture, there is a negative impact on developing resilience as it develops hesitancy to change for the employees. This severely negatively influences employees' capability to innovate solutions to new challenges and motivation to learn from future challenges.

The endeavors jointly shared by every employee within an organization are denoted as group culture. The joint efforts of diverse medical supply chain entities are needed by healthcare SCR to settle the matter (de Almeida et al., 2015). Effective supply chain relationships are likely to reduce conflicts in the multifaceted operations of the supply chain, which further enhances collabora-

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tion and resilience in the healthcare supply chain (Papadopoulos et al., 2017). The major emphasis of a group culture is on inter- and intra-organizational collaborative efforts resulting in enhanced commitment, trust, and transparency. Group culture facilitates timely information sharing to make decisions and deliver adequate services in a complex service setting like the healthcare sector. Naor et al. (2008) mentioned that teamwork activities like brainstorming are good for the development of everyday terminology. The grouping culture can foster supplier and customer collaboration in the organization's tasks (Schilke & Cook, 2015).

The parameters included in technology integration are service, innovation, product, and production. It is likely to help improve coordination and provide enhanced medical facilities to patients (Ho et al., 2016; Lee et al., 2013). Hautala-Kankaanpää (2022) investigated the influence of automated culture on operational performances and SCR and showed that technology integration significantly and positively affects supply chain management.

Supply chain management in healthcare is dedicated to the adoption of new and innovative technologies to exchange real-time information with supply chain entities that further add adequate healthcare services to patients and improve coordination (Ho et al., 2016). There is a positive impact of innovation and discovery on technology-integrated organizations; therefore, organizations need to highlight on optimization of these procedures. The healthcare supply chain on technology integration is likely to increase the capability to render effective healthcare services with innovative technologies that ensure maximum patient satisfaction (Ozkaya et al., 2015). There is increased readiness observed among the healthcare supply chain management for developing and adapting to innovative technologies, which would help them attain service differentiation and cost advantages. Ho et al. (2016) stated that technology integration enables the supply chain to generate positive innovation performance after becoming the technology leader. The hospitals can develop innovative and exploratory competencies through service innovation initiatives that are supported by technology integration. Thus, hospitals with integrated technology have a better position as they are aware of the benefits of service innovation (Lichtenthaler, 2016). It is expected that technology integration enables the healthcare supply chain to collaborate in a better way and develop healthcare supply chain resilience.

The development of culture proposes that organizations could have a long-term orientation for maintaining sustainability and can develop a flexible infrastructure to encounter disruptions. Based on the group culture, it is suggested that forming cohesive groups results in enhanced synchronization and collaboration of different processes complemented by higher levels of technology integration through effective infrastructure. The focus of rational culture is on an effective reward system; therefore, positive technology integration is likely to motivate employees to collaborate to achieve organizational goals through technology infrastructure support. However, change and sustainability are not encouraged by hierarchical culture; therefore, technology integration does not play an essential function in the association between hierarchical culture and resilience in the healthcare supply chain.

The study aims to assess the impact of rational, hierarchical, and group cultures on the healthcare supply chain resilience in Jordan, as well as investigate the moderating role of technology integration on the relationship between organizational culture and healthcare supply chain resilience. The conceptual model of the study is illustrated in Figure 1. The study has formulated the following hypotheses:

H1: Rational culture has a positive influence on healthcare supply chain resilience.

H2: Hierarchical culture has a negative influence on healthcare supply chain resilience.

H3: Group culture has a positive impact on healthcare supply chain resilience.

H4a: Technology integration has an influential moderating influence on the association between rational culture and healthcare supply chain resilience.

H4b: Technology integration has an influential moderating impact on the association be-

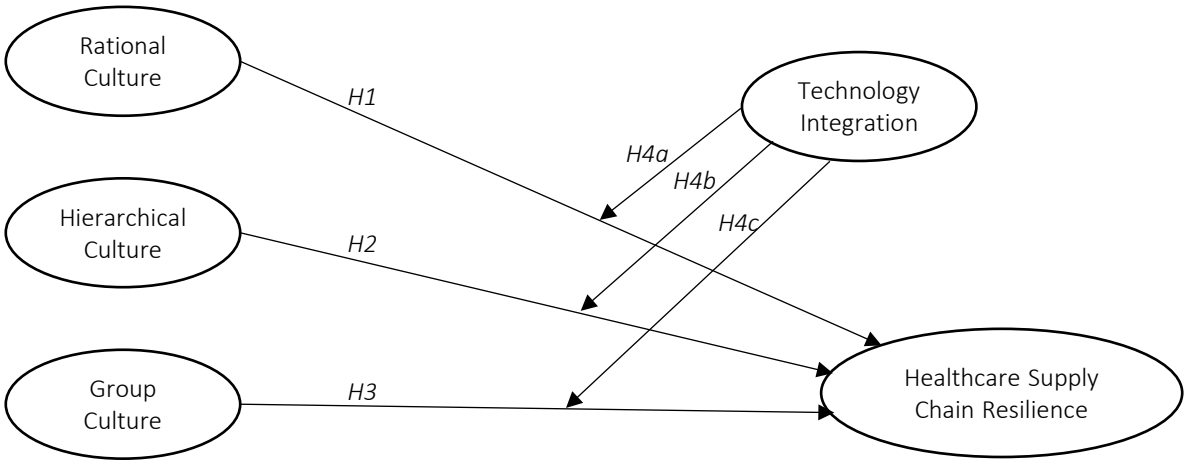

Figure 1. Study framework

tween hierarchical culture and healthcare supply chain resilience.

H4c: Technology integration has an influential moderating impact on the association between group culture and healthcare supply chain resilience.

2. METHODS

This study performed a cross-sectional research design. Participants were targeted from different hospitals in Jordan that are well-known for providing routine and advanced healthcare services to get an accurate and clear picture of operational issues faced in the supply chain management of healthcare. The main targets for the collection of perceptual responses included senior professionals designated as doctors, nurses, ray technicians, physical therapists, procurement officers, pharmacists, and lab technicians for at least three years or more. This diverse sample was chosen to gather diverse and comprehensive insights from senior professionals directly involved in healthcare supply chain management. The study ensured that the collected data were both reliable and representative of the local healthcare sector.

From the perspective of healthcare supply chain management in Jordan, such a survey design could be used to measure the relationship between organizational cultures, technology integration, and other factors related to healthcare supply chain management. To gather the data, an electronic survey questionnaire developed on Google Docs was posted on Facebook groups related to medical staff in Jordan and LinkedIn. The questionnaire was written in English, but it has been converted into Arabic to make it easy for the respondents. The questionnaire comprised two sections: demographics (Table 1) and close-ended items on organizational culture, technology integration, and resilience (Table A1, Appendix A). The demographics section collected basic information about the respondents, such as gender, age, education, job title, hospital sector, number of beds, and salary. The close-ended items section was adapted from previous studies to ensure validity and reliability; group culture, rational culture, and hierarchical culture items were taken from Mandal (2017).

The privacy of the participants was also ensured, and 304 responses were gathered for the study. The demographic details of the research respondents are provided in Table 1.

Statistical analysis was done using SPSS software. Multivariate analysis (MANOVA) was performed to investigate the association between the variables such as organization culture and SCR. It offers a comprehensive understanding of how changing independent variables impact related dependent variables. Furthermore, to investigate whether the proposed hypotheses are accurately described, the study tested goodness to observe the data. The goodness of fit test cannot detect discrepancies between observed and expected values, depending on sample size. Small samples may have low power to detect deviation from the expected distribution.

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Table 1. Demographic details of the participants

Item	Measure	Frequency	Percentage
Gender	Male	161	53
	Female	143	47
Age	25-35 years old	148	48.7
	36-46 years old	115	37.8
	>47 years old	41	13.5
Education	BA	204	67.1
	MA	71	23.4
	Ph.D.	29	9.5
Job Title	Doctor	123	40.5
	Nurse	139	45.7
	Ray technician	4	1.3
	Physical Therapist	1	0.3
	Procurement Officer	19	6.3
	Pharmacists	11	3.6
	Lab Technician	7	2.3
Hospital Sector	Military Hospital	60	19.7
	Health Ministry	162	53.3
	Private Hospital	25	8.2
	Educational Hospital	51	16.7
	Charity and International Organizations	6	2.0
No. of Beds	<50	91	29.9
	50-150	80	26.3
	151-251	51	16.8
	>252	82	27.0
Salary	<1000 JOD	239	78.6
	1000-2499 JOD	57	18.8
	2500-3999 JOD	4	1.3
	>4000 JOD	4	1.3

AMOS 17 was also used to examine complex relationships among variables simultaneously to further validate theoretical models. It enables the evaluation of the measurement properties of latent constructs by modeling the relationship between latent variables and indicators. Moreover, it assesses the goodness of fit of the measurement model and confirms the underlying structure of the latent variable. The limitation of this software is that it requires a large sample size, as a small sample size may produce unreliable results.

The procedures recommended by Churchill (1979) were adopted; for every latent element, the measurement items have been developed. To conceptualize, the scale items for existing latent factors were gathered and scanned. The items were employed to start the conceptualization of scale instruments and the development of the healthcare supply chain. The reviews from the expert panel were also accepted to conceptualize, develop, and increase the scale instrument. Appropriate modifications were made to the scale items for clarity, considering the suggestion of the expert panel. The growing intensities of content validity of the scale instrument were made sure by using step-by-step methods to enhance the validity of the scale for use in the healthcare supply chain. It was computed on a seven-point Likert scale (ranging from strongly disagree to strongly agree). Some statistics related to demographics were also inquired from the participants.

Initially, principal component analysis was conducted through confirmatory factor analysis to check the validity and reliability of the model. The results show that the items were loaded on a single factor. The Kaiser–Meyer–Olkin (KMO) value of 0.705 was obtained; Barlett's Sphericity test was also conducted, and it produced a significant value. Consequently, the results rejected the null hypotheses of the correlation matrix. Furthermore, KMO greater than 0.5 was confirmed by the adequate principal component analysis and the presence of correlation.

Table 2. Reliability statistics

Construct	Item	Factor loading	α	Composite reliability (CR)	Average variance extracted (AVE)
Rational Culture	RC1	0.890	0.936	0.927017	13.57367
	RC2	0.914			
	RC3	0.930			
	RC4	0.936			
Hierarchical Culture	HC1	0.702	0.839	0.893934	1.84802
	HC2	0.847			
	HC3	0.873			
	HC4	0.864			
Group Culture	GC1	0.872	0.918	0.94236	2.582277
	GC2	0.910			
	GC3	0.903			
	GC4	0.900			
Technological Orientation	TO1	0.840	0.806	0.866643	1.627041
	TO2	0.851			
	TO3	0.621			
	TO4	0.819			
	TO5	0.605			
Resilience	R1	0.854	0.932	0.948797	3.101648
	R2	0.880			
	R3	0.885			
	R4	0.922			
	R5	0.895			

Reliability is defined as the internal consistency of instruments computing a particular factor (Knapp & Mueller, 2010). This study used confirmatory factor analysis to compute the measured items. Table 2 presents the value of Cronbach's alpha for the item measures and demonstrates sufficient reliability.

3. RESULTS

The multivariate analysis was used to assess discriminant validity. This kind of validity is observed when the lowest value of AVE is higher compared to squares among correlation coefficients construct. The largest correlation coefficient of 0.62 (shown in Table 3) suggests a strong linear relationship between two variables; if one increases, the other increases as well.

Therefore, it is observed that discriminant validity is present in the measurement model. The size of fundamental associations between the constructs is in line with previous research and is referred to as nomological validity. Nomological validity is assessed using the correlation coefficients. The multicollinearity test was performed in the present study as moderate correlation coefficients were observed between more than one organizational culture. The threat of multicollinearity does not

Table 3. Correlation matrix of constructs

Correlation matrix of the constructs	X1	X2	X3	X4	X5
Group Culture	1.341				
	1				
Rational Culture	0.839	1.350			
	0.623	1			
Hierarchical Culture	0.071	0.068	1.105		
	0.058	0.0557	1		
Technology Integration	–0.069	–0.098	0.002	0.158	
	–0.150	–0.213	0.005	1	
Resilience	–0.060	–0.054	0.001	0.039	0.086
	–0.178	–0.159	0.003	0.335	1

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exist in the case of a variance inflation factor <10 (Hair et al., 2006). Hence, the measurement model exhibits sufficient nomological validity, which supports and confirms the expected relationship between the variables within a theoretical framework. Further, convergent validity was employed to support the validity of the study, which showed significant results (Table A2).

The goodness of fit for the measurement model is presented in Table 4. As described by Hair et al. (2006), the absolute and increment fit indices are within the prescribed limits. Moreover, the index for the goodness of fit is moderately toward the threshold, which is acceptable (Hu & Bentler, 1999). Therefore, the measurement model is stated to be reasonably suitable for the dataset.

Table 4. Goodness of fit

Cultural Challenges	
Chi-Square	10.67.405
df	35
Significance	0.000

The importance of the proposed hypotheses was tested by employing structural equation modeling (AMOS 17) summarized in Table 5. The results show that the effect of rational culture on healthcare SCR was not statistically significant (p-value = 0.156), which implied that H1 is not supported. The impact of hierarchical culture on healthcare SCR was statistically significant at the 0.05 level (p-value = 0.030), which supported H2. In light of the results, the impact of group culture on healthcare SCR was statistically significant (p-value = 0.007), supporting H3. Technological integration can enhance this resilience when aligned with rational (p-value = 0.042) and hierarchical cultures (p-value = 0.012). However, the interaction between group culture and technological integration does not appear to contribute significantly to healthcare SCR (p-value = 0.331). Table 5 shows that most of the coefficients were significant and positive, thus showing linearity between the variables.

Figure 2 demonstrates hypothesis testing through the structural model. The standardized coefficients on the paths indicate the strength and direction of these influences. Rational culture has a slight negative impact on healthcare SCR, with a standardized coefficient of –0.077, suggesting that an increase in rational culture may slightly decrease resilience. On the contrary, hierarchical culture shows a weak positive influence with a coefficient of 0.024, indicating

Table 5. Hypothesis testing

Hypothesis	Path	Std. Coefficient	t-value	p-value	Decision
H1	Rational Healthcare →SCR	–0.077	–1.1568	0.156	Rejected
H2	Hierarchical Healthcare →SCR	0.024	0.628	0.030	Supported
H3	Group Healthcare →SCR	0.159	2.708	0.007	Supported
H4a	Rational Culture*Technological integration → Healthcare SCR	0.037	0.465	0.042	Supported
H4b	Hierarchical Culture*Technological integration → Healthcare SCR	0.063	1.521	0.012	Supported
H4c	Group Culture*Technological integration → Healthcare SCR	–0.169	–2.158	0.331	Rejected

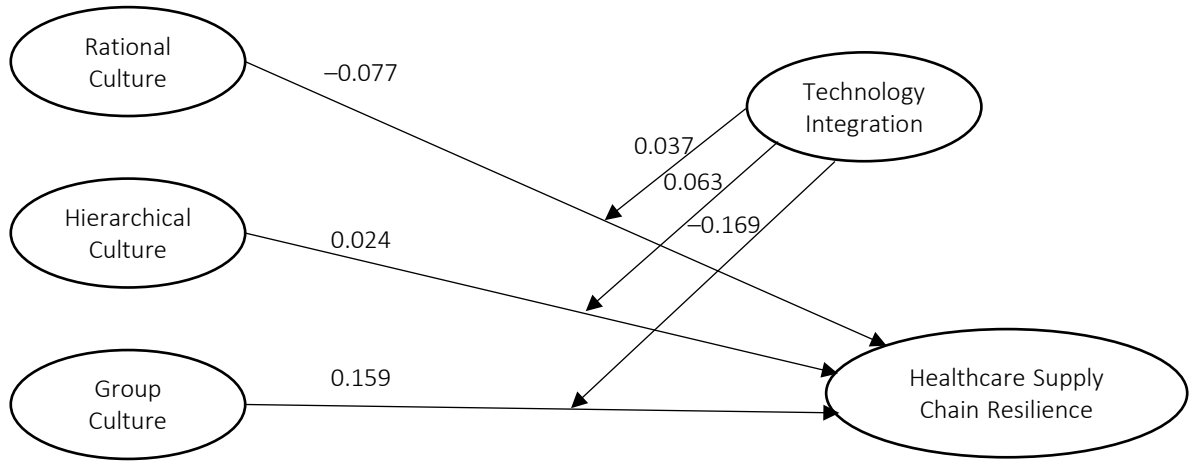

Figure 2. Structural model representing the results of hypothesis testing

a minimal enhancement of resilience. Group culture has the most substantial positive effect on resilience, with a coefficient of 0.159, implying that it significantly contributes to strengthening the healthcare supply chain. Technological integration further moderates these relationships, enhancing resilience when combined with rational (0.037) and hierarchical (0.063) cultures. However, it has a negative effect when integrated with group culture, as shown by a coefficient of –0.169, suggesting that technological integration may reduce healthcare SCR.

4. DISCUSSION

The study has empirically examined the role of rational, hierarchical, and group cultures as enablers for healthcare SCR. Contrary to initial expectations, the first hypothesis is rejected as the study reported that rational culture does not have a positive impact on healthcare SCR. This indicates that rational culture, while focused on efficiency and informed decision-making, may not significantly enhance the ability of the healthcare supply chain to withstand disruptions. The study highlights that despite efforts to reduce costs and waste and to encourage logical decision-making and open communication, rational culture does not necessarily translate into improved resilience. These findings contrast with those of McDermott and O'Dell (2001), who suggested that strong rational cultures could motivate employees to invest more in SCR. The study suggests that other factors or cultures may be more critical in achieving resilience in the healthcare supply chain. Osei et al. (2023) revealed a negative correlation between rational culture and environmental performance, with no significant link to social and economic performance. Rational culture was positively linked to both customer and supplier integration. This result is in contrast to the findings reported by Cao et al. (2015) and Porter (2019); however, it is in agreement with the findings of Braunscheidel et al. (2010). According to Braunscheidel et al. (2010), rational culture encourages strong external integration with customers and suppliers in the supply chain to boost competitiveness and performance.

The second hypothesis testing found that hierarchical culture has an adverse influence on healthcare SCR. The objective of hierarchical culture is to control and stabilize the organization; the outcomes suggest that it negatively influences healthcare SCR because it focuses on stability regulation of organization management through prompt communication and decision-making involving entities. Thus, sometimes flexibility is ignored in this culture. Hence, healthcare departments are likely to suffer due to disruptions. These findings are congruent with Mandal (2017), who revealed that organizational culture can allow SCR in clan and market cultures; at the same time, it can be challenging to adequately respond to unexpected events in hierarchical cultures because of their driven process and difficult formation. In contrast, some authors also advocate the adverse effect of hierarchical cultures on SCR (Cao et al., 2015; Braunschiedel et al., 2010). However, Altay et al. (2018) stated that the strong direction of hierarchy culture enables SCR to be capable of preparing for disturbances successfully.

The outcomes of the third hypothesis found that group culture has a positive impact on healthcare SCR. A collaborative group culture within a healthcare organization is crucial for the development of robust business continuity plans. It creates effective training initiatives that can remove potential disruptions. Making sure that healthcare entities are well-informed about potential disruptions and the corresponding mitigation strategies through knowledge sharing is of utmost importance. In the present scenario, group culture emphasizes the patient renders continuous services, and increased adaptability can be achieved by exchanging information. It is possible to achieve readiness for uncertainties if the healthcare supply chain readily adapts to changing situations and cooperates accordingly. The group culture facilitates collaborative working among the healthcare supply chain entities to develop business continuity plans. Birkinshaw et al. (2016) stated that group culture can be drafted as a positive supporter of healthcare SCR, built on dynamic capability views.

The last hypothesis of the study has found that technology integration has a moderate positive effect on the influence of rational and hierarchical cultures on healthcare SCR. It recommends the significance of rational and hierarchical cultures as valuable facilitators of healthcare SCR. However, the study observed no significant impact of technology integration on group culture that links with healthcare

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SCR. The technology allows access to data and analytics that can lead to more informed decision-making; further, it allows transparency, collaboration, and information sharing, which can foster organization. Similar to the results of the present study, Vickery et al. (2003) found that technologies have an influential effect on overall organizational culture and lead to increased supply chain integration. Tanriverdi (2005) concluded the same findings and validated that technology orientation offers firms significant advantages over their competitors by allowing activities like creation, searching, sharing, application, and retention (Alavi & Leidner, 2001; Lee et al., 2020). Cenamor et al. (2019) state that the advancement in technology increases its significance for organizations and supply chains. With the help of technology, there are more opportunities for firms to enhance and boost their systems and benefit from these developments.

Although the current paper gives essential details of the impact of organizational culture (rational, hierarchical, and group cultures) on supply chain management of the resilient healthcare system and the moderating role of technology integration on the relationship between dimensions of healthcare SCR and organizational culture, some limitations offer further research opportunities. Firstly, a small sample size was taken; a larger sample is recommended for future studies. Secondly, the analysis only focused on organizations that are working in Jordan. Hence, future research should gather data from other regions and differentiate the outcomes from the present study to attain a wide perspective. Fourthly, it is crucial to note that this study mainly concentrated on the perspective of hospitals and neglected the viewpoint of other sectors in the supply chain. Future studies could be enlarged by including these viewpoints to gain a better perception in regards to an organization's cultural effect and the role of technology in structuring healthcare SCR. Lastly, the current investigation did not include the influences of external elements, like natural disasters or political obstacles. Future studies could examine how these elements influence the organization.

CONCLUSION

The study explored the impact of organizational culture on healthcare supply chain resilience in Jordan, along with investigating the moderating role of technology integration on the relationship between organizational culture and healthcare supply chain resilience. The findings reveal that rational culture does not significantly impact healthcare supply chain resilience in Jordan, suggesting that it alone does not substantially enhance the resilience of healthcare supply chains, although its emphasis on structured processes and performance is valuable. In contrast, hierarchical culture demonstrated a statistically significant positive impact on healthcare supply chain resilience, highlighting the importance of having well-defined procedures and stability in decision-making during disruptions. While hierarchical structures may appear restrictive, they provide the stability and predictability necessary for managing complex and uncertain situations, thus supporting resilience in the healthcare supply chain. Group culture showed the most substantial positive effect on healthcare supply chain resilience. The collaborative nature of group culture facilitates effective communication and coordination among healthcare supply chain entities, which is crucial for maintaining resilience during disruptions. This highlights the importance of fostering strong interpersonal relationships and teamwork within healthcare organizations to enhance their capacity to manage and recover from supply chain challenges. The moderating role of technology integration in moderating these relationships revealed that technological advancements can enhance the benefits of rational and hierarchical cultures by improving coordination, information sharing, and innovative problem-solving capabilities. However, technology integration does not significantly moderate the relationship between group culture and healthcare supply chain resilience and has a negative impact. This suggests that while technology is a valuable tool, its effectiveness in enhancing group culture's contribution to resilience is limited.

This study's theoretical contribution lies in advancing the complex relationships between organizational culture on the understanding, technology integration, and healthcare supply chain resilience. The results of the present study unfold an understanding for healthcare policymakers and administrators as they

work to build more resilient healthcare supply chains that can withstand disruptions and deliver high-quality care to patients. The findings provide valuable insights for healthcare policymakers and administrators in Jordan and potentially other regions. By understanding the significant impact of rational, hierarchical, and group cultures on supply chain resilience, and the moderating role of technology integration, they can make informed decisions to integrate appropriate cultural practices and technological tools to enhance resilience. Given the moderating role of technology, the study suggests the strategic integration of technology to strengthen the impact of rational and hierarchical cultures on supply chain resilience. This practical advice can help healthcare organizations build more robust and adaptive supply chains.

AUTHOR CONTRIBUTIONS

Conceptualization: Noor Al-Ma'aitah.
Data curation: Noor Al-Ma'aitah.
Formal analysis: Noor Al-Ma'aitah.
Investigation: Noor Al-Ma'aitah.
Methodology: Noor Al-Ma'aitah.
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APPENDIX A

Table A1. Close-ended questionnaire items

Variable	Measurement
Group Culture (Mandal, 2017)	As a key HSC member, you have supervisors who every time motivate you to work as a team
	As a key HSC member, you have seniors who encourage employees to exchange opinions and ideas about upcoming healthcare technologies
	As a key HSC member, you have seniors who always encourage group meetings for discussion and idea exchange
	As a key HSC member, you have seniors who always encourage enhancing collaboration
Rational Culture (Mandal, 2017)	As a key HSC member, your incentive system strongly encourages you to aggressively follow your firm's objectives
	As a key HSC member, your incentive system is fair in rewarding people who accomplish the firm's objectives
	As a key HSC member, your incentive system recognizes the people who contribute the most to your firm's objectives
	As a key HSC member, your incentive system strongly urges you to fulfill the firm's vision and mission.
Hierarchical Culture (Mandal, 2017)	As a key HSC member, every small matter has to be followed up with higher officials for a permit
	As a key HSC member, every decision you make has to be sanctioned by your supervisor
	As a key HSC member, you are not permitted to make any decision without your supervisor's approval
	As a key HSC member, you and every employee have to depend on your supervisor's approval before executing any action
Technological Orientation (Mandal, 2017)	You use advanced technologies in your everyday operation
	You use updated technologies in your strategic operation
	You normally refrain from using outdated technologies
	You design your product/services always with the latest technologies
	You readily accept proven technological innovation in your organization
Resilience (Mandal, 2017)	You and key HSC members can restore quickly healthcare supply chain operations in the face of any disruption
	You and key HSC members are capable of providing uninterrupted healthcare services to your patients
	You and key HSC members are well adept financially to proactively meet contingencies
	You and key HSC members possess the capability to respond to disruptions in a positive manner
	You and key HSC members are capable of providing suitable healthcare services even in the face of disruptions

Table A2. Outcomes of convergent validity

	Group_Culture1	Group_Culture2	Group_Culture3	Group_Culture4	Rational_Culture1	Rational_Culture2	Rational_Culture3	Rational_Culture4	Hierarchical_Culture1	Hierarchical_Culture2	Hierarchical_Culture3	Hierarchical_Culture4	Technological_Orientation1	Technological_Orientation2	Technological_Orientation3	Technological_Orientation4	Technological_Orientation5	Resil1	Resil2	Resie3	Resil4	Resil5
Group_Culture1	1	.750**	.668**	.715**	.502**	.491**	.473**	.492**	.091	.038	.004	.059	.384**	.338**	.093	.308**	.182**	.435**	.448**	.439**	.423**	.453**
Group_Culture2	.750**	1	.781**	.727**	.525**	.520**	.521**	.526**	.123*	.073	-.071	.023	.411**	.344**	.154**	.337**	.215**	.467**	.473**	.505**	.481**	.514**
Group_Culture3	.668**	.781**	1	.784**	.544**	.523**	.520**	.527**	.116*	.039	-.028	.040	.436**	.414**	.192**	.341**	.160**	.436**	.464**	.467**	.484**	.504**
Group_Culture4	.715**	.727**	.784**	1	.515**	.495**	.490**	.531**	.117*	.043	-.011	.063	.400**	.347**	.130*	.302**	.235**	.476**	.466**	.495**	.489**	.503**
Rational_Culture1	.502**	.525**	.544**	.515**	1	.738**	.750**	.788**	.142**	.004	-.054	.020	.394**	.401**	.160**	.438**	.177**	.446**	.420**	.457**	.461**	.457**
Rational_Culture2	.491**	.520**	.523**	.495**	.738**	1	.816**	.801**	.135**	.030	-.029	-.004	.362**	.358**	.168**	.366**	.181**	.448**	.441**	.433**	.478**	.447**
Rational_Culture3	.473**	.521**	.520**	.490**	.750**	.816**	1	.842**	.156**	.031	-.034	.052	.366**	.386**	.202**	.408**	.196**	.463**	.437**	.455**	.502**	.517**
Rational_Culture4	.492**	.526**	.527**	.531**	.788**	.801**	.842**	1	.158**	.053	-.029	.069	.416**	.436**	.206**	.447**	.220**	.479**	.461**	.524**	.532**	.540**
Hierarchical_Culture1	.091	.123*	.116*	.117*	.142**	.135**	.156**	.158**	1	.517**	.454**	.432**	.187**	.235**	.249**	.210**	.335**	.175**	.231**	.126*	.219**	.228**
Hierarchical_Culture2	.038	.073	.039	.043	.004	.030	.031	.053	.517**	1	.633**	.625**	.196**	.213**	.183**	.177**	.274**	.185**	.227**	.121*	.187**	.172**
Hierarchical_Culture3	.004	-.071	-.028	-.011	-.054	-.029	-.034	-.029	.454**	.633**	1	.747**	.046	.101*	.152**	.037	.124*	.020	.049	.018	.068	.063
Hierarchical_Culture4	.059	.023	.040	.063	.020	-.004	.052	.069	.432**	.625**	.747**	1	.126*	.152**	.228**	.142**	.192**	.106*	.104*	.093	.113*	.110*
Technological_Orientation1	.384**	.411**	.436**	.400**	.394**	.362**	.366**	.416**	.187**	.196**	.046	.126*	1	.794**	.313**	.563**	.370**	.504**	.447**	.489**	.457**	.497**
Technological_Orientation2	.338**	.344**	.414**	.347**	.401**	.358**	.386**	.436**	.235**	.213**	.101*	.152**	.794**	1	.381**	.569**	.341**	.514**	.446**	.512**	.517**	.529**
Technological_Orientation3	.093	.154**	.192**	.130*	.160**	.168**	.202**	.206**	.249**	.183**	.152**	.228**	.313**	.381**	1	.483**	.274**	.237**	.272**	.276**	.302**	.326**
Technological_Orientation4	.308**	.337**	.341**	.302**	.438**	.366**	.408**	.447**	.210**	.177**	.037	.142**	.563**	.569**	.483**	1	.427**	.475**	.465**	.472**	.447**	.501**
Technological_Orientation5	.182**	.215**	.160**	.235**	.177**	.181**	.196**	.220**	.335**	.274**	.124*	.192**	.370**	.341**	.274**	.427**	1	.407**	.445**	.304**	.317**	.342**
Resilience1	.435**	.467**	.436**	.476**	.446**	.448**	.463**	.479**	.175**	.185**	.020	.106*	.504**	.514**	.237**	.475**	.407**	1	.764**	.666**	.692**	.681**
Resilience2	.448**	.473**	.464**	.466**	.420**	.441**	.437**	.461**	.231**	.227**	.049	.104*	.447**	.446**	.272**	.465**	.445**	.764**	1	.678**	.737**	.732**
Resilience3	.439**	.505**	.467**	.495**	.457**	.433**	.455**	.524**	.126*	.121*	.018	.093	.489**	.512**	.276**	.472**	.304**	.666**	.678**	1	.838**	.740**
Resilience4	.423**	.481**	.484**	.489**	.461**	.478**	.502**	.532**	.219**	.187**	.068	.113*	.457**	.517**	.302**	.447**	.317**	.692**	.737**	.838**	1	.812**
Resilience5	.453**	.514**	.504**	.503**	.457**	.447**	.517**	.540**	.228**	.172**	.063	.110*	.497**	.529**	.326**	.501**	.342**	.681**	.732**	.740**	.812**	1

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