

Original Research

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Assessing the Resilience of the Supply Chain of Medicines and Consumables during Disasters Based on the World Economic Forum Framework: A Case of Iran

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Abstract

Objectives: Pharmacies play a critical role in healthcare systems, especially during emergencies. Disruptions in the supply of medicines and consumables pose significant challenges in disaster response and recovery. Given the complexity and socio-political sensitivity of the resilient medicine supply chain, this study aimed to assess the resilience of the supply chain of medicines and consumables during disasters in Iran based on the World Economic Forum framework.

Methods: A cross-sectional, descriptive-analytical study was conducted using a validated questionnaire. Data were collected from 224 pharmacies in Shiraz city using the census method for hospital-based pharmacies and cluster and simple random sampling methods for city-level pharmacies. The collected data were analyzed and modeled using SPSS v.21 and Smart PLS v.3 software.

Results: The results confirmed the validity and reliability of the questionnaire developed for assessing the resilience of the supply chain of medicines and consumables during disasters based on the World Economic Forum framework. The results also demonstrated that participation (41.04), policy (30.22), information technology (26.72), and strategy (23.46) directly and positively contributed, respectively, to enhancing the resilience of the medicines and consumables supply chain during disasters.

Conclusions: According to the results, the medicines and consumables supply chain resilience in Iran can be improved by facilitating international partnerships, developing better relationships with suppliers, moving toward digital and information technology-based supply chains, having a strategic plan for the medicines and consumables supply chain in disasters, and developing coordinating policies and effective strategies.

Introduction

Over the past 2 decades, natural disasters, along with man-made and technological disasters, outbreaks of diseases, and war, have affected many people in the world.¹ These disasters cause homelessness, food shortages, outbreaks of diseases, emergence of mental illnesses.² In 2019, 396 natural disasters claimed 11,755 lives and affected 95 million people.³ Developing countries are the worst hit,⁴ and Asia is the most disaster-prone continent. Iran, always marked as vulnerable, belongs among the ten most disaster-prone countries,⁵ with 90% of its population vulnerable to such events as earthquakes and floods. It has the sixth-largest number of global natural disasters, such as the explosion of the Shazand Arak refinery and the collision of 2 trains.^{6,7} At the same time, floods in Golestan, Lorestan, and Khuzestan, and earthquakes in Bam and Rudbar have happened in Iran.⁸ But what is important in such cases of disasters is timely and adequate responses to these disasters because if timely and adequate health measures and medical services are not taken care of, the people's health may be endangered.^{9,10}

Before and during disasters, the support process and supply chain are critical pillars of disaster management.¹¹ Disruption in the supply chain may be effective in all processes of providing goods or services and cause loss of funds, an increase in cost, and damage in the form of consecutive consequences.¹² The findings of the study conducted by Dash et al. also revealed that organizations had serious transportation woes at large levels during disasters, and these woes had an immediate negative impact on the rescue rate of people affected by the crises and disasters.¹³

The supply chain should not only be able to cope with accidents and disasters, but it should also have high flexibility for returning to an original state or moving toward improved conditions.

and complexities in the medicines and consumables supply chain, can be studied. Also, the described model of the supply chain of medicines and consumables can be generalized for other needs in accidents and disasters.

Data availability statement. The datasets used and/or analyzed during the current study are available from the corresponding author upon reasonable request.

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Author contribution. Ramin Ravangard conceptualized and designed the study. Narges Khatoon Siadat collected the necessary data. Milad Ahmadi Marzaleh, Abolfazl Raeyat Mohtashami, and Ahmad Allahyari Bouzanjani conducted the data analysis. All authors contributed to data interpretation. The initial draft of the manuscript was written by Ramin Ravangard, Abolfazl Raeyat Mohtashami, and Milad Ahmadi Marzaleh. All authors reviewed, revised, and approved the final version of the manuscript.

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Competing interests. The authors have no conflict of interest to declare.

Ethical Standards. This study was approved by the Ethics Committee of Shiraz University of Medical Sciences (Code IR.SUMS.REC.1398.448). The participants were free to choose to participate in the study, and once the objectives of the research were explained to them, their written informed consent was obtained. The questionnaire was completed anonymously, and the participants were assured of the confidentiality of their answers to the questions.

Informed consent. Informed consent was obtained from all participants who participated in the study.

Consent for publication. None.

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