



# A Qualitative Analysis of Therapeutic Capacity with Consideration of Financial Energy for Pandemic Preparedness

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## Abstract

This study addresses the adaptability of therapeutic capacity architecture foresight, considering financial energy for pandemic preparedness. In essence, the lack of sufficient financial resources and their dispersion from areas of greatest need hinders the full management of a crisis (pandemic). Financial resources, along with certain activities and forward-looking, sustainable planning innovations, can establish a form of preparedness before pandemics occur. Therefore, in this applied developmental research, the statistical population includes all prominent academic experts in Isfahan city, possessing relevant scientific knowledge about financial energy and having experience in hospitals as managers or consultants. Data were collected through interviews with healthcare experts, and to design a model for the foresight of therapeutic capacity architecture considering financial energy for pandemic preparedness in the country's hospitals, a grounded theory approach was employed, encompassing open, axial, and selective coding. The process of data collection and analysis was not sequential but performed in a zigzag, simultaneous manner, which reflects the nature of theoretical sampling. Open coding was conducted through line-by-line analysis of the interviews. Based on the identified open codes, axial codes were developed, and with the help of selective coding, the theoretical model was developed. In applying foresight to therapeutic capacity architecture in hospitals, the implementation of its core phenomena plays a pivotal role. These phenomena include social monitoring and management, environmental monitoring and management, and economic monitoring and management. These are operationalized through a series of strategies and actions in the fields of health-centric services, high-quality and up-to-date services, attention to crisis preparedness design and architecture, biomimicry, and pollution management. Financial energy can contribute to political, economic, legal, and cultural sustainability.

**Keywords:** *financial resources, energy, foresight, pandemic, architecture, sustainable innovation.*

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## 1. Introduction

Given the specific and critical conditions arising from pandemics, the lack of pre-determined plans and failure to utilize available resources can exacerbate the crisis, leading to social and human instability, with biological and fatal consequences. This issue, along with its associated challenges, prompted the development of this research, aimed at leveraging financial energy to guide the architecture of therapeutic capacity. This would provide managers with a clearer vision of the future and how to approach it [1]. Due to structural reasons, the abundance of non-renewable resources, and the lack of a clear future outlook, this area has not been seriously or practically addressed in Iran. Furthermore, despite the urgent global need for management strategies to improve infrastructure activities, the formal application of comparative studies on pre- and post-research conditions has yet to be implemented, owing to the novelty of the topic.

Performance measurement of energy is one of the most effective methods for providing information to make decisions regarding dependency and improving the possibility of therapeutic capacity architecture and the utilization of energy resources. Improving the level of sustainable energy performance is a key element in achieving sustainable development goals at both micro and macro levels (economic units and countries) [2-4].

Resource depletion depends on two aspects of technology: first, the likelihood of technological advancement, and second, the ease of replacing other production factors, particularly labor and reproducible capital, in place of finite resources in production. Land (as a collection of natural reserves) and labor (as the physical and mental abilities of people) are described as economic resources that meet human needs through goods by classical economic theory [5]. This categorization seems logical considering past lifestyles. Over time, capital (all production tools, i.e., various tools, machinery, equipment, daily and professional items) and entrepreneurial abilities (the specific human resources needed in the market economy to combine all other resources in the production process of goods and services) have become components of economic resources [1, 2]. These four elements together form the economic resources of a society, company, or organization. Therefore, previously identified medical resources can be unconditionally attributed to economic resources, ensuring the application of appropriate management principles.

Hence, space, resources, and the specific resources of a healthcare facility represent capital, while staff refers to labor within the framework of modern economic theory [6]. However, the availability of resources and their concentration in areas of greatest need does not allow us to successfully overcome medical challenges without the necessary energy to activate these resources and activities, or to increase their quantity if necessary. Thus, we examine related research in this field:

Thomson et al. (2021) studied the "impact of health sector financing policy in Europe against economic shocks (evidence from the first year of the COVID-19 pandemic and the 2008 global financial crisis)." They noted that the COVID-19 pandemic, occurring just ten years after the 2008 global financial crisis, created an economic shock. They concluded that economic shocks challenge healthcare systems, as they simultaneously increase the need for government-funded healthcare while reducing government revenue. This article examined policy responses to the financial crisis and COVID-19 in Europe and assessed the resilience of health financing policy against economic shocks. It found that some healthcare systems were weakened by the responses to the 2008 crisis. Prioritizing health in public spending allocation ensures that energy and resource power can be utilized to achieve primary and long-term (sustainable) goals. They concluded that many healthcare systems will likely face budgetary pressure in the coming years, as the experience of the 2008 crisis shows that austerity is not an option, as it undermines the efficiency of healthcare systems and the expansion of universal coverage [1].

Rahimzadeh et al. (2021) explained and assessed the effects of energy consumption and financial development on economic growth in selected Islamic countries. The estimated model results show that, at a 5% significance level, the effect of financial development on economic growth is positive and significant. Furthermore, labor and capital have a positive and significant effect on economic growth at the 5% level, as these are important production inputs, and their increase can lead to higher economic growth. Based on the estimated results, healthcare and educational expenditures have a positive and significant effect on economic growth at the 5% significance level, indicating that higher healthcare and educational expenditures lead to healthier and better-trained workforces, which in turn enhance economic growth [2].

Balouchi (2020), in a study titled "Evaluation of the impact of financial cost factors on internal auditing in

medical universities of Iran," analyzed descriptive and inferential statistics data from questionnaires using the Kolmogorov-Smirnov test, Pearson correlation coefficient, and regression. The findings showed that financial cost factors influence internal auditing at Iran's medical universities [7].

Taheri et al. (2020) identified and prioritized revenue sources and their impact on the financial performance of medical universities. Given that Iran's higher education system, in line with the global trend, has faced rising educational costs and economic instabilities in recent years, and government public budgets have not adequately covered university expenses, Iranian universities have significant weaknesses in diversifying their revenue portfolios and are highly dependent on tuition revenues. Amid these challenges, the government has pushed universities to seek revenue from other sources. One of the main approaches to maintaining financial balance and economic sustainability in universities (particularly medical universities) is focusing on revenue diversification policies to pave the way toward achieving their missions and goals. Additionally, revenue diversification is a policy variable discussed in the context of internationalization and competitiveness of Iranian universities [4].

Asadi et al. (2013) investigated the dynamic relationship between energy consumption and financial development in Iran. The estimated model results indicated a positive impact of economic growth, financial development index, industrialization index, and urbanization on long-term energy consumption. Furthermore, based on the results of the Granger causality test, a short-term causal relationship from financial development to energy consumption was confirmed [8]. Given the nature of this relationship, it can be concluded that with financial development growth in Iran, energy consumption increases. Therefore, it is recommended that investments aimed at enhancing financial development in Iran focus on utilizing new energy technologies, enabling the country to meet the increasing energy demand while controlling environmental pollution.

## 2. Methodology

Given that this research seeks to answer the research questions through a review of existing literature, interviews with academic and professional experts, and the use of a questionnaire, the research population consists of financial and healthcare experts, both professional and academic. The selection and interviews with the experts will continue until

theoretical saturation is achieved. In this research, content analysis was initially employed to review and code the interviews. The results were reviewed by experts, and the current conditions of the country for implementing the findings were examined, localized, and screened.

Subsequently, the extracted information was analyzed using the DEMATEL method, aimed at determining the nature and degree of interaction between components. Pairwise comparisons were conducted to analyze the relationships between these components. Following this, the study utilized the experiences of financial field professors and the information from healthcare professionals to conduct foresight on the subject. Scenario writing and the use of questionnaires were employed to forecast and plan for pandemic times.

Since the research takes place in a natural environment with minimal researcher intervention, it qualifies as a field study. For collecting data on the literature review and research background, a library research method was used. For gathering information to answer the research questions, field and questionnaire methods were employed.

In this study, the researcher began the open coding process by repeatedly reading the transcribed interviews to gain a comprehensive understanding of them. Then, different sections of each interview were read and compared to the overall idea derived from the study of that interview. The researcher continued by analyzing individual words, phrases, sentences, and paragraphs. To clarify how respondents reacted to different conditions, the researchers used general questions such as "Who is responding?" and "How do they respond?" These questions help the researcher identify the actions/reactions that individuals or organizations exhibit in response to events, discussions, problems, or occurrences under certain conditions. These actions and reactions may occur at a strategic level, where responses are primarily aimed at influencing the phenomenon to solve a problem, or at an operational level, where actions follow more repetitive and standardized procedures.

## 3. Findings and Results

Coding is a systematic procedure developed by Strauss and Corbin for identifying categories, characteristics, and dimensions in data. Initially, categories are identified through open coding, followed by axial coding, where categories are linked to one another. Finally, selective

coding integrates the categories, subcategories, and their relationships to form a theoretical model.

Open coding involves carefully analyzing, naming, and classifying the data. In this stage, the collected data from interviews are coded to more easily identify similarities and differences. Through analyzing sentences and viewpoints of interviewees, initial codes are extracted. The common and emphasized codes across all interviewees are then identified as the final codes.

While open coding separates data into different categories, axial coding links the categories and subcategories based on their characteristics and dimensions.

According to the systematic approach by Strauss and Corbin, the categories derived from raw data are gathered into a model known as the axial coding paradigm. This model consists of six components, as described below.

**Table 1.** Causal Conditions, Contextual Conditions, Intervening Conditions, Core Phenomenon, Strategies, and Outcomes

General Category	Subcategory	Concept	Codes
<b>Causal Conditions</b>			
Political Sustainability	Active Political System	Political System	Presence of Active Political Society
	Political Society	Political Society Stability	Existence of an active political system
Economic Sustainability	Stability in Economic System	Economic Stability	Stable economy and development
Law Sustainability	Enforcing Laws	Legal Firmness	Strict laws and governance in healthcare
	Changes in Laws and Policies	Adapting laws towards sustainability	Legal flexibility for sustainable governance
Cultural Sustainability	Focusing on Health and Well-being	Legal Support for Health	Diverse regulations ensuring health alongside spiritual and mental well-being
	Maintaining Public and Social Stability	Enforcing Key Laws	Maintaining social stability by enacting laws
	Social Awareness and Cultural Focus	Cultural Knowledge	Cultural awareness in sustainability
	Respecting Community and Social Dynamics	Cultural Sensitivity	Focus on societal and cultural understanding
<b>Contextual Conditions</b>			
Internal Environment	Internal Hospital Rules	Hospital Rules	Enforcing internal hospital regulations
	Stability in Hospital Practices	Sustained Operations	Maintaining quality practices in hospitals
	Planning and Action	Strategic Initiatives	Action plans for healthcare reforms
	Future-Proofing Hospitals	Future-Oriented Health Plans	Planning ahead for sustainable health infrastructure
Employee Environment	Enhancing Professional Knowledge	Employee Development	Using experienced individuals and new knowledge
	Employee Performance	Professional Knowledge Enhancement	Boosting knowledge and innovation across staff
Knowledge & Awareness	Awareness in Society	Raising Community Awareness	Awareness initiatives for community care
	Professional and Cultural Awareness	Cultural and Professional Sensitivity	Adapting cultural norms for enhanced care
Infrastructure Sustainability	Development of Resources	Facility Development	Infrastructure development for healthcare
	Creating Resources for Sustainability	Resource Creation	Creating sustainable health resources
<b>Intervening Conditions</b>			
External Organizational Influence	Collaboration with Hospitals	Environmental Collaboration	Hospitals and communities working together
	Environmental Influence on Healthcare	Community Influence	Environmental impact on hospitals
Organizational Conditions	Employee and Physician Performance	Hospital Performance	Performance management of doctors and staff
Facility Conditions	Hospital Structure	Structural Integrity	Organizational structure and capability management
	Medical Facility Standards	Standardized Facility Performance	Standardization of hospital facilities
Core Phenomenon (Innovation)	Medical Facility Availability	Equipment Access	Access to modern medical facilities
	Innovation	Environmental Management	Environmental monitoring practices
Strategies and Actions	Social Monitoring	Social Management	Social management practices
	Economic Monitoring	Economic Management	Financial and economic monitoring for healthcare
	Service Quality and Updates	Quality Improvement	Service Upgrading
	Expanding Health Services	Health-Focused Services	Expanding health-centric services for community

Technological Adaptation	Keeping Pace with Tech	Tech Integration	Adoption of new healthcare technologies
Crisis Preparedness	Designing for Crisis	Crisis Architecture	Planning healthcare facilities for crisis readiness
Environmental Sustainability	Sustainable Energy Use	Energy Efficiency	Optimizing the use of clean energy in healthcare
Green Space	Creating Green Environments	Green Facilities	Designing hospitals with green spaces and eco-friendly environments
Environmental Management	Waste and Pollution Control	Pollution-Free Environment	Managing pollution and ensuring environmental health
Outcomes			
Societal Outcomes	Improving Economic Welfare	Welfare and Economic Growth	Enhancing community well-being and economy
	Ensuring Safety and Health	Public Health and Safety	Increasing public safety and health levels
	Reducing Healthcare Costs	Cost Efficiency	Lowering the cost of healthcare
	Environmental Preservation	Environmental Conservation	Protecting and maintaining a healthy environment
Organizational Outcomes	Enhancing Organizational Standing	Organizational Improvement	Enhancing organizational reputation
	Accurate Programming	Programming Efficiency	More efficient planning and programming
	Increasing Efficiency	Improved Efficiency	Increasing operational efficiency in hospitals
	Employee Satisfaction	Improved Work Environment	Increasing staff satisfaction and working conditions

#### 4. Discussion and Conclusion

The aim of this research was to analyze the therapeutic capacity of hospitals in Iran, considering financial energy, in preparation for future pandemics. This was achieved using a paradigmatic model based on grounded theory. By analyzing the raw data collected from in-depth interviews with healthcare experts, and employing a systematic coding process, a model was developed that identified causal, contextual, and intervening conditions, along with strategies and outcomes for increasing pandemic preparedness.

The findings of this research highlight several key causal conditions that contribute to the development of therapeutic capacity in hospitals during pandemics. These include political, economic, legal, and cultural sustainability. Political stability was shown to be essential in ensuring that healthcare policies are not influenced by short-term political shifts [2, 9]. Economic stability was another crucial factor, reinforcing that hospitals need consistent financial support to sustainably enhance their pandemic response capacity [2]. Legal sustainability highlighted the need for transparent and enforceable laws that encourage organizations to adopt necessary measures for pandemic preparedness, particularly in terms of financial energy [10]. Cultural sustainability, emphasizing the acceptance of new services and technologies, was also significant in ensuring that society and organizations are prepared for the rapid changes brought by pandemics [1].

The core phenomenon identified in the study revolved around monitoring and managing environmental, social, and economic factors. Environmental monitoring, in particular, was found to be crucial for managing the financial energy needed to handle pandemics. Social and economic monitoring played a complementary role, helping to ensure

that healthcare organizations can respond swiftly to emerging challenges [11].

The research also outlined key strategies, including providing high-quality and up-to-date services, focusing on public health, aligning with Industry 4.0 and Society 5.0, and ensuring crisis preparedness. The importance of crisis preparedness was reinforced by the need to design and architect hospital infrastructure to withstand future crises [4, 12]. Environmental sustainability strategies, such as biomimicry and pollution management, were highlighted as essential for long-term resilience [1].

Finally, the outcomes of the study were categorized into both tangible and intangible societal and organizational results. Tangible societal outcomes included preserving the environment, while intangible results focused on improving community welfare. On the organizational level, the study found that sustainable innovation not only increases efficiency and revenue but also enhances organizational standing and employee satisfaction [2].

The findings of this research are consistent with previous studies that emphasize the role of financial sustainability and strategic foresight in preparing healthcare systems for pandemics. Similarly, Thomson et al. (2021) discussed the resilience of healthcare financing in Europe during the COVID-19 pandemic, pointing out that stable financial support is crucial for ensuring long-term healthcare capacity [1].

Political and economic sustainability were identified as foundational elements in this research, and the study's identification of cultural sustainability as a critical factor is supported by the work of Rahimzadeh et al. (2021), who found that public acceptance of new services and technologies is vital for healthcare organizations to remain adaptive and responsive during pandemics [2].

In terms of strategic recommendations, the emphasis on aligning healthcare systems with Industry 4.0 and Society 5.0 reflects the prior studies [13-16], who argued that modern technology and innovation are essential for healthcare organizations to remain competitive and resilient during crises.

The results of this research offer a comprehensive model for enhancing hospital preparedness for pandemics by focusing on political, economic, legal, and cultural sustainability. These findings are aligned with previous studies that emphasize the importance of financial stability, legal frameworks, and cultural adaptability in managing healthcare crises. By adopting the strategies outlined in this study—such as ensuring crisis readiness, embracing technological innovation, and managing environmental sustainability—healthcare organizations can improve their pandemic preparedness, resulting in both tangible and intangible benefits for society and organizations alike

### Authors' Contributions

Authors equally contributed to this article.

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### Declaration of Interest

The authors report no conflict of interest.

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### Ethical Considerations

All procedures performed in this study were under the ethical standards.

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