Golestan University of Medical Sciences

Jorjani Biomedicine Journal

Online ISSN: 2645-3509

Applying a Qualitative Approach in Designing the Model of Business Sustainability of Hospitals and Medical Centers

Alireza Shirmohammadi [1], Farhad Vafaie [2*], Farshid Namamian [3], Mohammad Taban [4]

1. Ph.D. Candidate, Department of Management, Kermanshah Branch, Islamic Azad University, Kermanshah, Iran
2. Assistant Professor, Department of Management, University of Kurdistan, Kurdistan, Iran
3. Assistant Professor, Department of Management, Kermanshah Branch, Islamic Azad University, Kermanshah, Iran
4. Associate Professor, Department of Management, University of Ilam, Ilam, Iran

Article Type:

Original article

Article History:

Received: 23 Jul 2022
Revised: 28 Aug 2022
Accepted: 30 Aug 2022
Published: 31 Dec 2022

Correspondence:

Farhad Vafaie

Assistant Professor, Department of Management, University of Kurdistan, Kurdistan, Iran

f.vafaie@uok.ac.ir

DOI: 10.29252/jorjanibiomedj.10.4.70

Abstract

Background and Objectives: Little attention to sustainability in business, particularly in the healthcare sector, together with the absence of a model within acceptable limits for this purpose, were among the main objectives to design a business sustainability model for healthcare facilities (viz., hospitals and medical centers) in the present study.

Material and Methods: The qualitative meta-synthesis approach was implemented in this study, and the most significant factors shaping sustainability in business were identified. The statistical population included the articles, books, and research reports published and retrieved from the reliable journals and databases, between 2002 and 2021. Moreover, the experts, i.e., the university professors and specialists involved in healthcare at Ilam University of Medical Sciences, Ilam, Iran, were consulted. At this stage, snowball sampling was done based on the model proposed by Sandelowski and Barroso, until theoretical saturation was reached. In total, 26 articles were selected and finalized for the meta-synthesis. The Critical Appraisal Skills Programme (CASP) was correspondingly utilized to assess the quality of the study samples, and Cohen's kappa coefficient (κ) was employed to measure the validity of the extracted codes.

Results: The study findings demonstrated that the business sustainability model for the healthcare sector comprised of 3 categories (viz. environmental, social, and economic), 12 concepts, and 65 codes, with a very goodness of fit.

Conclusion: In sum, business sustainability in healthcare facilities could be achieved if all environmental, social, and economic components developed in the give model as well as the effective indicators within each category were taken into account.

Keywords: Commerce Sustainability [MeSH]; Qualitative Research [MeSH], Health Facilities[MeSH]

 Publisher: Golestan University of Medical Sciences.

Highlights

- Business sustainability model consists of three economic, social and environmental categories.
- The mentioned model is a three-level model, the first level of which is made up of categories, the second level of concepts, and the third level of codes (indices).

Introduction

Over the past quarter-century, sustainability in healthcare has become of utmost importance. In spite of this, few organizations have put this issue into effects (1). Moreover, concepts, such as sustainability, transparent management, respect for environment, social responsibility, and the like have been incorporated into business models, which had been once applied almost exclusively from financial perspectives. Modern organizations have further realized that the utilization of such concepts in their philosophy not only makes a difference, but also plays the role of a determinant for surviving in the market. Accordingly, the every-day social role of many organizations, including healthcare providers, such as healthcare facilities (viz. hospitals and medical centers), is expanding (2). Sustainable management practices, aimed at upgrading the quality of social life, can thus have positive impacts on employees' interpretations. Sustainability can also enhance the continuous process of re-evaluating the interrelationships of economic growth, civil society, and the environment. This process becomes much more complicated as soon as it is viewed from the perspective of healthcare management, especially in strategic planning (1).

With regard to the social component, the analysis of sustainability in healthcare facilities is not possible without giving emphasis to human capital. The social component of sustainability is related to human characteristics, such as skills, dedication, and experience, which all encompass both the internal and external environment of an organization. Furthermore, it is associated with the effects of social actions fulfilled by healthcare facilities. Sustainability accordingly concentrates on society interests as a whole (3, 4). As maintained by the Global Reporting Initiative (GRI), the social component of sustainability is about the effects of organizations on the social systems in which they operate. The indicators disclosed in the GRI can thus help to identify the key performance aspects related to work practices, human rights, society, and social responsibility (3, 5). Considering the idea of sustainability from the economic perspective, development is assumed sustainable when economic growth brings justice and opportunity to all humans in practice, without granting privileges to some species, destroying limited natural resources, and exceeding tolerance capacity in systems (6). For business, financial efficiency can be a performance indicator of economic sustainability in the short or long term. It additionally reflects consumers' evaluation of goods and services, as well as the productivity of factors, such as capital, labor, natural resources, and knowledge (3, 7). Therefore, the forecasting requirements of production and consumption in the economic system in hospitals and medical centers should follow the limiting conditions in the social and environmental systems. The society further believes that the environmental dimension encourages organizations to reflect on the impact of their activities on the environment in the form of the optimal use of natural resources, and this contributes to integrating environmental management into work routines. Environmental sustainability accordingly means expanding Earth's capacity by exploiting that available in diverse ecosystems, while minimizing environmental degradation. For this, there may be a need to think about renewable ideas to reduce pollution, use fossil fuels, adopt protection policies, and replace non-renewable products with renewable energies (8, 9). The management of healthcare facilities with its new concepts, including environmental management and social responsibility, is thus one of the master keys to solving the most serious problems of the modern world (6, 8).

Nowadays, the importance and necessity of sustainability has also deeply affected the nature of businesses, and has further generated the concept of business sustainability in business management.

The concept of business sustainability accordingly takes account of socially responsible businesses, which implies creating organizations with positive relationships with society in which they operate, so the organization's relationships with society and the environment are a major factor shaping its ability to function effectively (10). Globalization and rising competition have also driven organizations in different sectors, especially in healthcare one, to reconsider their management strategies and processes. Sustainability in healthcare is still a novel concept, which has been less discussed (11). The business in such organizations can accordingly have significant impacts on society in three environmental, economic, and social dimensions, as the pillars of sustainability (12). Since the today's management of healthcare services has become one of the main concerns among governments, and global changes have led to new challenges in this respect, taking measures for business sustainability is one of the necessities in the current situation. Therefore, business sustainability models must be designed for healthcare facilities, because an acceptable model can be the key to business success and an unacceptable one can be among the main reasons for failure in organizations (13). Obviously, the integration of sustainability into a business model provides better conditions for decision-making to improve the business outlook, as flexibility and adaptability to environmental changes increase, especially in healthcare (14). Currently, budget pressures and aging populations have underlined the need for sustainable healthcare systems at the international level (15). As stated by Ramirez, West, and Costell, healthcare organizations worldwide are undergoing pressure from stakeholders to provide high-quality, affordable, accessible, and sustainable services, which raises the need for hospitals to search for sustainable solutions to carry on high-quality healthcare services (16). Some have further suggested the need for more research on a number of important issues, such as providing services sustainably in the growing healthcare service networks (15). The requirement for sustainability in organizations, including healthcare providers, has thus helped to change the nature of business relationships and their management styles, which presents sustainable models by reducing costs and escalating productivity (16). Making a proper and timely response to the various challenges of the business environment accordingly necessitates the use of an appropriate business sustainability model for the managers of these organizations (13). Considering the numerous benefits of business sustainability models and the necessity of designing such models for healthcare organizations, the need to identify and extract the components of business sustainability models in hospitals and medical centers is strongly felt. Therefore, this study was an attempt to identify and extract the components of the business sustainability model for healthcare facilities in order to fill the aforementioned gap, applying the qualitative meta-synthesis approach. In other words, this study aimed to design a business sustainability model for hospitals and medical centers. To meet these objectives, the main research question addressed was:

What are the codes, concepts, and categories of the business sustainability model for healthcare facilities?

In this way, the related research background was initially reviewed; using some articles published in this line, and then the most important information was summarized, as illustrated in Table 1.

Table 1. Research background

Title	Reference	Objective-methodology	Results
Modeling factors affecting the sustainability of business model	(17)	Identifying and designing the components influencing the business sustainability models for growth and stabilization in the information and communication technology - Synthesis	The factors shaping the model for business sustainability are innovation, shared value creation, collaborative leadership, economic variables, and corporate governance.
Designing a sustainable business model by using soft systems methodology and value triangle business model canvas (Case study: Farassan Manufacturing and Industrial Company)	(13)	Identifying and designing the key components and the significant factors constituting the company's sustainable business model - Soft systems methodology and value triangle	A new approach was developed for designing business sustainability models.
Attaining circular economy through business sustainability approach: An integrative review and research agenda	(18)	Attaining a clear understanding of circular economy through a business sustainability approach - A systematic review	The relationships between circular economy principles and nine processes for business sustainability were identified.
Sustainability at the healthcare organizations: An analysis of the impact on the environment, society, and economy	(19)	Analysis of Brazilian healthcare organizations - Descriptive research method	A few healthcare organizations have thus far superficially mentioned the concept of sustainability.
Analysis of hospital's sustainability: Economic, environmental, and social lenses	(20)	Analyzing the sustainability of Brazilian hospitals - A qualitative descriptive approach	There was the lack of strategic planning in Brazilian hospitals.
Sustainability in healthcare: Combining organizational and architectural levers	(21)	Combining organizational and architectural levers to improve healthcare service delivery sustainability - A literature review	In total, 10 levers and their interrelationships were identified and described.

Materials and Methods

In this applied, developmental research with a descriptive method, the qualitative meta-synthesis approach was implemented to design a business sustainability model for healthcare facilities (viz. hospitals and medical centers). The meta-synthesis was exploited here to integrate several qualitative studies, and then generate comprehensive and interpretative findings. This approach was not theoretical by nature, and did not necessarily include too much thematic literature. Moreover, it was not an extract from the interpretations of similar studies, but the combination of the interpretations of the main outcomes of the selected studies to reach the findings, and above all point toward the deep understanding of a particular field (22). The statistical population included the articles, books, and research reports published and retrieved from the reliable journals and databases, between 2002 and 2021. Moreover, the experts, i.e., university professors and specialists involved in healthcare at Ilam University of Medical Sciences, Ilam, Iran, were consulted. In fact, the data collection method was library searches and semi-structured, in-depth interviews. At this stage, snowball sampling was done based on the model proposed by Sandelowski and Barroso, until theoretical saturation was reached. In total, 26 articles were selected and finalized for the meta-synthesis. The Critical Appraisal Skills Programme (CASP) was correspondingly utilized to assess the quality of the given articles, and Cohen's kappa coefficient (κ) was employed to measure the validity of the extracted codes. The analysis of the findings of previous qualitative studies related to the subject and the research objectives was based on a meta-synthesis approach, using the seven-step

model of Sandelowski and Barroso, as follows (23).

Results

Step One: Developing Research Questions

The research questions were developed according to different aspects, such as who, what, when, methodology, and statistical population. The questions were accordingly expressed as follows:

- What are the codes (viz. indicators), concepts, and categories of the business sustainability model for healthcare facilities?

- What is the time limit of the desired research?

- How are the research data collected?

- What is the statistical population to identify the components of the business sustainability model?

Step Two: Systematic Literature Review

Following the searches for the keywords, such as sustainability, business, business sustainability, business model, business sustainability model, sustainability components, hospital sustainability, sustainability in healthcare facilities, and sustainability in healthcare organizations in the reliable journals and databases, including Magiran, Scientific Information Database (SID), Civilica, Noormags, PubMed, ScienceDirect, Springer, Scopus, Google Scholar, and Emerald; 224 articles were retrieved.

Step Three: Searching and Selecting Appropriate Manuscripts

At the beginning of the search process, it was determined whether the retrieved articles were relevant to the research question and objectives or not. For this purpose, the selected articles were read and reviewed several times, and the ones that did not fit the research question and objectives in terms of the desired parameters were excluded. The process of article search and screening was accordingly performed based on various parameters, such as title, abstract, and content, so that the title of the articles was first reviewed and the cases that did not meet the research question and objectives were removed. Then, the abstracts of the remaining articles were studied, and the irrelevant ones were discarded. During the screening process, the number of articles decreased each time. Finally, the remaining articles were reviewed based on their content (i.e., their full text), and the unrelated ones were excluded. In total, 26 articles entered the next step of meta-synthesis. The summary of the article search and screening process is depicted in Figure 1. The Critical Appraisal Skills Programme (CASP), which is typically used in qualitative research, was implemented at this step to assess the quality of the articles. In this way, 10 criteria, i.e., research objectives, research logic, research design, sampling, data collection, reflexivity, ethical considerations, accuracy in analysis, clear statement of findings, and research value were considered for evaluating the articles, by allocating scores to each index from poor (1) to excellent (5), wherein the articles were divided into five categories: excellent (41-50), very good (31-40), good (21-30), moderate (11-20), and poor (0-10), and the cases scored less than good were removed.

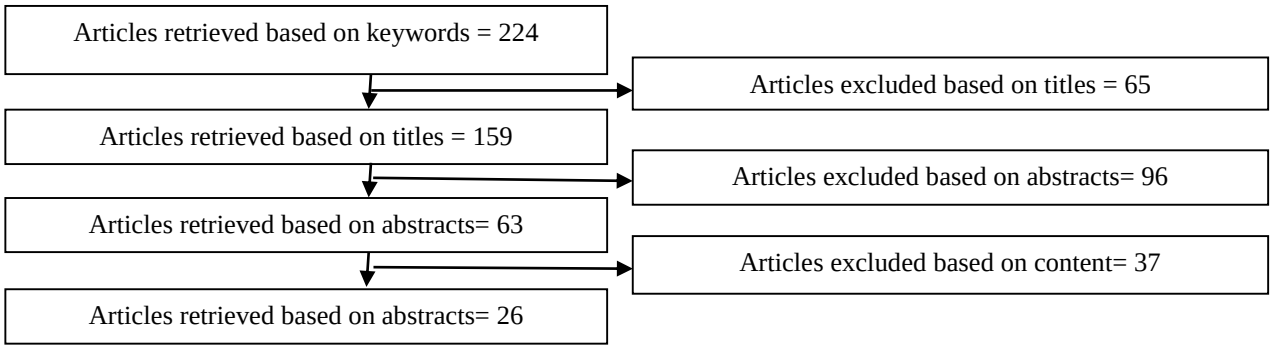

Figure 1. Article search and screening process

Step Four: Extracting Information from Articles

At this step, the selected articles were repeatedly reviewed, and the business sustainability themes were identified and extracted, which were then recorded in a table based on the author's full name, publication date, and reference. As well, the open coding process, developed by Corbin and Strauss was used, in which the codes were initially extracted from the articles, and then coding was done to form the concepts (24).

Step Five: Analysis and Synthesis of Qualitative Findings

Upon careful and repeated reviews of the extracted codes at the fourth step, their common concepts were discovered. As soon as the concepts were identified based on their similarities, they were placed in a common category to describe the content in the best possible way. By repeating this process about the concepts, the categories were developed. Finally, the obtained model was given to 12 experts selected by snowball sampling, using semi-structured, in-depth interviews. According to the experts' opinions, the final model for business sustainability arising from the meta-synthesis was confirmed with 3 categories, 12 concepts, and 65 codes. Table 2 shows the demographic characteristics of the experts consulted in this study.

Table 2. Experts' demographic characteristics

No.	Gender	Education	Affiliation
1	Male	PhD in Community Health	Faculty and editorial board member
2	Female	PhD in Environmental Health	Faculty member with relevant research records
3	Male	PhD in Healthcare Management	Faculty member and head of hospital
4	Female	PhD in Health Education	Faculty and editorial board member
5	Male	PhD in Biostatistics	Faculty member with relevant research records
6	Male	PhD in Business Management	Head of a private hospital
7	Female	PhD in Nursing	Faculty member
8	Male	PhD in Statistics	Faculty member with relevant research records
9	Female	PhD in Immunology	Faculty member and head of hospital
10	Female	Gynecologist	Head of hospital
11	Male	PhD in Epidemiology	Faculty member and head of hospital
12	Male	Pain Fellowship	Faculty member and university chancellor

Step Six: Quality Control

To ensure quality and reliability at this step, the final model was submitted to one of the experts, blinded to the integration of the codes and concepts by the researchers, to group the codes into concepts. Accordingly, 12 concepts were created by the researchers and 11 concepts were generated by the expert, of which 10 concepts had commonalities. The concepts presented by the researchers were further matched with the ones suggested by the expert, and Cohen's kappa coefficient (κ) was obtained as 0.766, based on Table 3 and Relations 1 and 2. Since this value was over 0.6, it revealed a very good reliability of the model.

Table 3. Cohen's kappa coefficient (κ) calculation

$0.769 = \frac{A+D}{N}$ = Observed agreements		Researchers' opinions		
		Yes	No	Total
Expert's opinions	Yes	A=10	B=1	11
	No	C=2	D=0	2
	Total	12	1	13

Relation 1 $$\text{Random agreements} = \frac{1}{13} \times \frac{2}{13} \times \frac{12}{13} \times \frac{11}{13} = 0.0092$$

Relation 2 $$k = \frac{\text{Observed agreements} - \text{Random agreements}}{1 - \text{Random agreements}} = 0.766$$

Step Seven: Presentation of Findings

At this step, the findings from the qualitative reviews of previous studies, including the codes, concepts, and categories, were presented. Here, the main components of business sustainability comprised of three categories, viz. environmental (with 3 concepts and 13 codes), social (with 7 concepts and 33 codes), and economic (with 3 concepts and 19 codes), as presented in Table 4.

According to the study findings, the final model for business sustainability in hospitals and medical centers is displayed in Figure 2.

Table 4. Categories, concepts, and codes constituting the business sustainability model for healthcare facilities

Categories	Concepts	Codes	References
Environmental	Waste management	Monitoring and optimizing waste and medical waste production, encouraging supply chains to create recycling networks, exploiting clean technology to reduce emissions into water, air, and soil, establishing industrial and human wastewater treatment plants, reducing pollution, and protecting water resources	(25), (26), (27), (28), (29)
	Emissions, fuel, and energy	Choosing eco-friendly vehicles, optimizing fuel and energy consumption, using clean and renewable energy, reducing greenhouse gas production and emission	(21), (25), (26), (28), (29), (30)
	Environmental policies and measures	Complying with environmental standards and ISO14001 certification, conforming to government environmental policies, obligating supply chains to follow environmental laws and regulations	(20), (27), (28), (29), (30)
Social	Mutual relationships with stakeholders and shareholders	Participating in decision-making, respecting stakeholders' rights, providing education and development for stakeholders, delivering equal treatments to shareholders and stakeholders, improving mutual trust with stakeholders	(17), (25), (29), (30), (31), (32)
	Social responsibility	Providing timely and high-quality services, monitoring patient satisfaction, adhering to commitments, delivering transparent and fair services, contributing to humanitarian activities, developing native and local communities	(17), (20), (25), (28), (29), (33)
	Occupational health, safety, and hygiene	Quality of work life, workplace health and safety management, public safety, occupational health and safety certificates and standards	(19), (20), (25), (28), (29)
	Human resources management	Diversity of employees, employment, labor relations, diversity and equality of opportunities, job satisfaction and well-being, fair compensation and wages	(19), (20), (25), (31), (34)
	Education and culture	Training employees, encouraging academic research toward sustainability, promoting sustainability culture, fostering public culture, establishing cultural partnerships with associations, raising health awareness and patient health	(5), (17), (28), (29), (31), (35), (36)
	Professional ethics	Honesty, mutual respect, respect for clients, privacy and confidentiality of patient information, bribery, corruption and money laundering, fair competition	(17), (25), (29), (31), (37), (38)
Economic	Value creation	Lean management, quality improvement, added value, profitability, productivity, competitive advantage	(13), (15), (17), (25), (26), (29), (39)

	Financial management	Cash flows, stock price, financial performance, financial resources, equity, development of financial reporting and evaluation system, tax rate	(5) , (16), (17), (18), (25), (29), (40)
	Organizational management	Risk management, organizational agility, innovation, entrepreneurship, marketing, development of organizational capabilities	(3), (14), (18), (20), (25), (28), (41), (42)

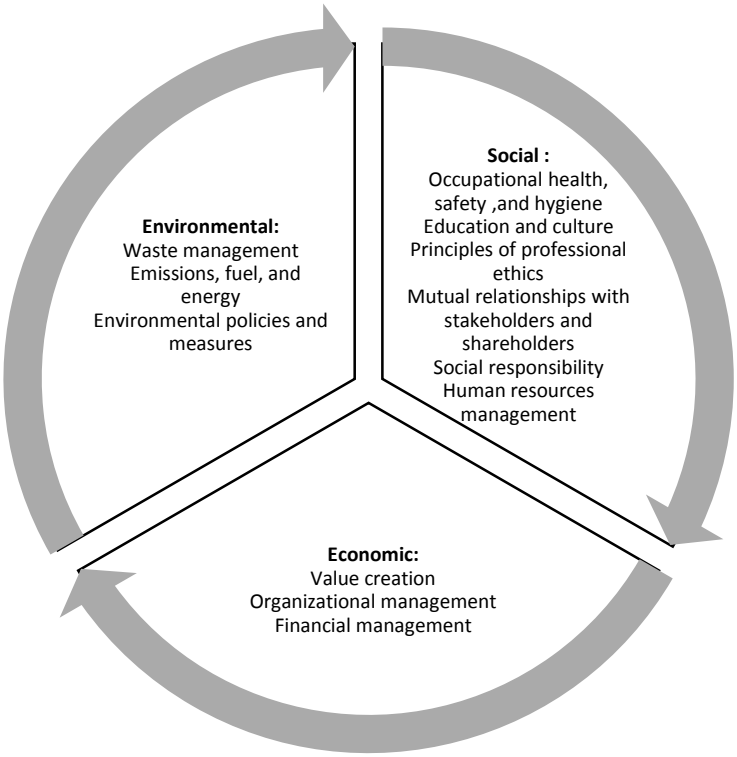

Figure 2. Business sustainability model for healthcare facilities (the study results)

Discussion

The present study aimed to design a business sustainability model for hospitals and medical centers, so it examined sustainability in business based on the reviews of previous research, using the qualitative meta-synthesis approach. The study findings accordingly revealed that the business sustainability model for healthcare facilities consisted of at least 65 codes in the form of 12 concepts and 3 categories. The findings further showed that the mentioned model had three levels; viz. the first level was made up of categories, the second level comprised of concepts, and the third level contained codes (or indicators). In addition, the social component with 7 concepts and 33 codes was of utmost importance, the economic component having 3 concepts and 19 codes was in the second place, and the environmental component consisting of 3 concepts and 13 codes was ranked third, according to the researchers and experts.

The social component of sustainability was related to human characteristics, such as skills, dedication, and experience, which encompassed both the internal and external environment of an organization. Furthermore, it was associated with the effects of social actions fulfilled by organizations, here healthcare facilities. Sustainability accordingly concentrates on society interests as a whole (3, 4). In fact, the concept of social sustainability considers the social responsibility of businesses, which should

guarantee their creation with positive and constructive relationships with the society in which they operate. Therefore, the social sustainability of businesses seeks to maintain and stabilize the sociocultural components of society in close connection with other dimensions of sustainability (viz. economic and environmental). Comparing the study results with previous research in this line confirmed that some codes of the social category of the business sustainability model for hospitals and medical centers were consistent with the ones reported in Haddiya et al. (33), Popovic et al. (31), Hassas Yeganeh et al. (29), Ahmadi et al. (32), and GRI (28). For example, the social indicators of the GRI could identify key performance aspects related to work practices, human rights, society, and social responsibility (19, 28). In Haddiya et al. (33), social responsibility and ethics had been further mentioned as the main dimensions of sustainability, along with economic and environmental components, but in this research, they were categorized as the sub-concepts of the social category.

The economic component of the business sustainability model for hospitals and medical centers also had at least 19 codes, grouped into three concepts of value creation, financial management, and organizational management. The ultimate goal of businesses from an economic point of view is thus to achieve long-term success and a competitive advantage, which requires the efficient and optimal use of resources and return on investment at the right time, as well as overall profitability and positive financial performance. One of the major problems facing the application of the concepts of economic sustainability in healthcare organizations of developing countries is the caution in the use and investment of new energies, which may bring an economic risk at first. However, it is important to note that economic sustainability is the basis of a stable, safe, and just society. In addition, it enables sustainable development. A sustainable economy also creates many opportunities to improve other social and environmental sectors. Therefore, the forecasting requirements of production and consumption in the economic system in hospitals and medical centers should follow the limiting conditions in the social and environmental systems. It can also highlight the growth, efficiency, and stability of resources, wherein economic conditions are essential tools to achieve sustainability (20). Comparing the study results with previous research, some indicators of the economic component were in line with the ones declared in Haddiya et al. (33), Colabi (17), Alamdar Youli et al. (13), Rezaee (25), and GRI (28).

Besides, the environmental component of the business sustainability model contained the material and non-material actions by policymakers and planners through establishing environmental laws and regulations, defining appropriate relationships with stakeholders, and directing organizational systems to reduce the negative impacts on the environment. In fact, this dimension of business sustainability refers to one part of the characteristics and indicators of sustainable businesses, which must be considered in order to minimize environmental damage. Therefore, the environmental responsibilities of organizations and the activities that take place in this direction can be a source for legitimizing their competitive advantage, forming better images of the organizations in the minds of customers as the eco-friendly ones, and make their activities more sustainable. Promoting sustainability in healthcare organizations can be thus achieved through some key indicators, such as reducing energy costs by optimizing the operational performance of equipment with less electricity consumption, hospital measures related to pollution regarding the hospital wastewater treatment and medical waste disposal as well as harmful factors, viz. heavy metals and radio isotopes, using no serums in plastic packaging and toxic drugs. These key indicators can accordingly affect all three pillars of sustainability, for example, by minimizing the use of serums in plastic packaging and medicines that can reduce purchasing costs (economic dimension), moderating the amount of waste (environmental dimension), and diminishing substances harmful to human health (social dimension) (19). Regarding the comparison

between the study results and those in previous research, many indicators of the environmental component corresponded with the ones highlighted in Haddiya et al. (33), GRI (28), Pimenta and Ball (30), Buffa et al. (27), and Rezaee (25).

Conclusion

Using the qualitative meta-synthesis approach with a comprehensive view and a detailed and in-depth examination of the content of previous research in this study was to identify and extract the content of the business sustainability model for hospitals and medical centers, since some codes and most concepts in all three categories of sustainability had not been found in the domestic and international literature. This designated the innovation and significance of the present study.

Based on the review of previous research and the findings of the present study, managers in healthcare facilities are recommended to increase sustainability of hospitals and medical centers by continuously paying much more attention to the three components of sustainability (viz. social, economic, and environmental) in line with the indicators presented in this study, because it will not be possible to achieve business sustainability without considering other dimensions. In addition, presenting periodic and regular sustainability reports can lead to the improvement of their social position in domestic and international communities, the growth of their good reputation, and the expansion of their level of social responsibility. Such managers are thus suggested to have self-evaluations of the current and desirable business sustainability situation based on the indicators of this model in hospitals and medical centers.

There are always limitations in any research, and the present study was not an exception. The meta-synthesis approach recruited here required a comprehensive and repeated study of the thematic literature, as well as the identification of indicators and concepts contained in them, and their combination and interpretation to discover the common categories, which demanded group-based and time-consuming research. In addition, the lack of appropriate text mining software packages made the work more difficult. The time limit in selecting the articles and examining the indicators also gave rise to the possibility that factors other than those investigated in this research might have been effective in designing the business sustainability model for healthcare facilities. Therefore, further research and the inclusion of other parameters could lead to the discovery of unknown factors. Against this background, it is suggested to conduct this type of study quantitatively, considering a specific statistical population, fit the model with quantitative methods, such as structural equation modeling and degree of correlation, and check its dimensions and indicators. It is finally recommended to address the challenges of implementing the research model developed in this study in future research.

Acknowledgment

The author of the present study would like to express their gratitude and appreciation to the professors of the Ilam University of Medical Sciences.

Funding source(s)

The financial resources of this study were provided by the author.

Conflict of interest

The author declares that there is no conflict of interest respecting all aspects of this research.

References

1. Gimenez C, Sierra V, Rodon J. Sustainable operations: Their impact on the triple bottom line. International journal of production economics. 2012;140(1):149-59. [DOI]

2. Handayani PW, Hidayanto AN, Sandhyaduhita PI, Ayuningtyas D. Strategic hospital services quality analysis in Indonesia. Expert Systems with Applications. 2015;42(6):3067-78. [DOI]

3. Podein RJ, Hernke MT. Integrating sustainability and health care. Primary Care: Clinics in Office Practice. 2010;37(1):137-47. [DOI] [PMID]

4. Lega F, Prenestini A, Spurgeon P. Is management essential to improving the

performance and sustainability of health care systems and organizations? A systematic review and a roadmap for future studies. Value in Health. 2013;16(1):S46-S51. [DOI] [PMID]

5. Borgonovi E, Compagni A. Sustaining universal health coverage: the interaction of social, political, and economic sustainability. Value in health. 2013;16(1):S34-S8. [DOI] [PMID]

6. Alexander A, Walker H, Naim M. Decision theory in sustainable supply chain management: a literature review. Supply Chain Management: An International Journal. 2014. [DOI]

7. Beske P, Land A, Seuring S. Sustainable supply chain management practices and dynamic capabilities in the food industry: A critical analysis of the literature. International journal of production economics. 2014;152:131-43. [DOI]

8. Gimenez C, Tachizawa EM. Extending sustainability to suppliers: a systematic literature review. Supply Chain Management: an international journal. 2012. [DOI]

9. Perera FdPR, Peiró M. Strategic planning in healthcare organizations. Revista Española de Cardiología (English Edition). 2012;65(8):749-54. [DOI]

10. Sharafi L, Rezaei R, Mirakzadeh A, Karamidehkordi E. Investigation of measuring patterns of sustainability level in small and mid-sized businesses in agriculture. Journal of Entrepreneurship in Agriculture. 2018;4(4):1-20.

11. Altpeter M, Schneider EC, Whitelaw N. Examining strategies to build and sustain healthy aging programming collaboratives. Health Education & Behavior. 2014;41(1_suppl):27S-33S. [DOI] [PMID]

12. Buys L, Mengersen K, Johnson S, Van Buuren N, Chauvin A. Creating a Sustainability Scorecard as a predictive tool for measuring the complex social, economic and environmental impacts of industries, a case study: Assessing the viability and sustainability of the dairy industry. Journal of environmental management. 2014;133:184-92. [DOI] [PMID]

13. Alamdar Youli F, Mohammadi A, Alimohammadlou M, Abbasi A. Designing a sustainable business model by using soft systems methodology and value triangle business model canvas (case study: Farassan Manufacturing and Industrial Company). Modern Research in Decision Making. 2020;5(1):95-117.

14. Mukherjee A, Kamarulzaman NH, Vijayan G, Vaiappuri SK. Sustainability: A comprehensive literature. Handbook of research on global supply chain management: IGI Global; 2016. p. 248-68. [DOI]

15. Rodriguez R, Svensson G, Wood G. Assessing corporate planning of future sustainability initiatives in private healthcare organizations. Evaluation and Program Planning. 2020;83:101869. [DOI] [PMID]

16. Moro Visconti R, Morea D. Big data for the sustainability of healthcare project financing. Sustainability. 2019;11(13):3748. [DOI]

17. Colabi AM. Modeling Factors Affecting the Sustainability of Business model. Management Researches. 2020;13(47):111-34.

18. Bansal S, Jain M, Garg I, Srivastava M. Attaining circular economy through business sustainability approach: An integrative review and research agenda. Journal of Public Affairs. 2022;22(1):e2319. [DOI]

19. Machado CM, Scavarda A, Kipper LM, Santa R, Ferrer MA. Sustainability at the Healthcare Organizations: an Analysis of the Impact on the Environment, Society, and Economy. Chemical Engineering Transactions. 2015;45:727-32.

20. Machado CM, Scavarda A, Vaccaro G, Korzenowski AL, Batista E, editors. Analysis of hospital's sustainability: Economical, environmental, and social lenses. IIE Annual Conference Proceedings; 2015: Institute of Industrial and Systems Engineers (IISE).

21. Pinzone M, Lettieri E, Masella C. Sustainability in healthcare: Combining organizational and architectural levers. International Journal of Engineering Business Management. 2012;4:38. [DOI]

22. Zimmer L. Qualitative meta-synthesis: a question of dialoguing with texts. Journal of advanced nursing. 2006;53(3):311-8. [DOI] [PMID]

23. Sandelowski M, Barroso J. Handbook for synthesizing qualitative research: springer publishing company; 2006.

24. Corbin JM, Strauss A. Grounded theory research: Procedures, canons, and evaluative criteria. Qualitative sociology. 1990;13(1):3-21. [DOI]

25. Rezaee Z. Business sustainability research: A theoretical and integrated perspective. Journal of Accounting literature. 2016. [DOI]

26. Lüdeke-Freund F, Carroux S, Joyce A, Massa L, Breuer H. The sustainable business model pattern taxonomy-45 patterns to support sustainability-oriented business model innovation. Sustainable Production and Consumption. 2018;15:145-62. [DOI]

27. Buffa F, Franch M, Rizio D. Environmental management practices for sustainable business models in small and medium sized hotel enterprises. Journal of Cleaner Production. 2018;194:656-64. [DOI]

28. Global Reporting Initiative (GRI). G4 Sustainability Reporting Guidelines: https://www.globalreporting.org/resourcelibrary. GRIG4-Part1-Reporting-Principles-and-Standard-Disclosures pdf. 2018.

29. Hassas Yeganeh Y, Babajani J, Taghavifard MT, Arianpoor A. Business Sustainability Performance Model in Iran. Journal of Management Accounting and Auditing Knowledge. 2018;7(27):181-204.

30. Pimenta HC, Ball PD. Analysis of environmental sustainability practices across upstream supply chain management. Procedia Cirp. 2015;26:677-82. [DOI]

31. Popovic T, Barbosa-Póvoa A, Kraslawski A, Carvalho A. Quantitative indicators for social sustainability assessment of supply chains. Journal of cleaner production. 2018;180:748-68. [DOI]

32. Ahmadi HB, Kusi-Sarpong S, Rezaei J. Assessing the social sustainability of supply chains using Best Worst Method. Resources, Conservation and Recycling. 2017;126:99-106. [DOI]

33. Haddiya I, Janfi T, Guedira M. Application of the Concepts of Social Responsibility, Sustainability, and Ethics to Healthcare Organizations. Risk Management and Healthcare Policy. 2020;13:1029. [DOI] [PMID] [PMCID]

34. Gatto A. A pluralistic approach to economic and business sustainability: A critical meta-synthesis of foundations, metrics, and evidence of human and local development. Corporate Social Responsibility and Environmental Management. 2020;27(4):1525-39. [DOI]

35. Kumar A, Anbanandam R. Development of social sustainability index for freight transportation system. Journal of cleaner production. 2019;210:77-92. [DOI]

36. Mani V, Gunasekaran A. Four forces of supply chain social sustainability adoption in emerging economies. International Journal of Production Economics. 2018;199:150-61. [DOI]

37. Montalbán-Domingo L, García-Segura T, Sanz MA, Pellicer E. Social sustainability criteria in public-work procurement: An international perspective. Journal of Cleaner Production, 198:1355-1371. [DOI]

38. Sierra LA, Yepes V, Pellicer E. A review of multi-criteria assessment of the social sustainability of infrastructures. Journal of Cleaner Production. 2018;187:496-513. [DOI]

39. Hossain M. Frugal innovation and sustainable business models. Technology in Society. 2021;64:101508. [DOI]

40. Jameton A, McGuire C. Toward sustainable health-care services: Principles, challenges, and a process. International Journal of Sustainability in Higher Education. 2002. [DOI]

41. Szopik-Depczyńska K, Kędzierska-Szczepaniak A, Szczepaniak K, Cheba K, Gajda W, Ioppolo G. Innovation in sustainable development: an investigation of the EU context

using 2030 agenda indicators. Land use policy. 2018;79:251-62. [DOI]

42. Dhahri S, Omri A. Entrepreneurship contribution to the three pillars of sustainable development: What does the evidence really say? World Development. 2018;106:64-77. [DOI]

How to cite:

Shirmohammadi A, Vafaie F, Namamian F, Taban M . Applying a Qualitative Approach to Design a Business Sustainability Model for Hospitals and Medical Centers. *Jorjani Biomedicine Journal*. 2022; 10(4):70-82.