

A multi-stakeholders view of the barriers of social sustainability in healthcare supply chains

Analytic hierarchy process approach

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Abstract

Purpose – The purpose of this paper is to develop a framework for the identification, categorization and prioritization of social sustainability barriers in health-care supply chains.

Design/methodology/approach – An exploratory survey tool is used to identify barriers that are relevant to a health-care supply chain. The identified barriers are grouped into five main categories and experts' opinions were applied to validate the content. Finally, an analytical hierarchical process (AHP) is used to prioritize the main categories and sub-categories of the barriers.

Findings – The exploratory phase identified 34 barriers that are relevant to a health-care supply chain. These barriers were grouped into the following categories: poor infrastructure, organizational culture, poor coordination, stakeholder disparity, and uncertainty. Organizational culture and poor coordination were assigned the highest priority through the AHP. Overall, lack of management support, lack of commitment and lack of coordination were found to be the top relevant barriers to a health-care supply chain.

Research limitations/implications – This study only explored and prioritized the barriers of social sustainability. Future research should explore the impact of the identified barriers on the overall performance of the hospital supply chain.

Practical implications – The findings of this study may be of value to the local health-care industry in achieving their objectives by overcoming social sustainability barriers, which would in turn facilitate the implementation of social sustainability programs that can positively contribute to the overall supply chain performance.

Social implications – Social sustainability has grown in importance as a pressurizing issue to push supply chain managers to assess their social impacts on the communities. This is especially important in service supply chains such as health care, where human element is a part of every stage.

Originality/value – Despite practitioners' and academics' growing emphasis on the social dimension of sustainability, the categorization and prioritization of social sustainability practices across health-care supply chains and general service care supply chains have not been addressed. This study aims to cover this gap by contributing to both the academic literature and the practical health-care environment.

Keywords Social sustainability, Analytical hierarchical process, Barriers of social sustainability, Health-care supply chains

Paper type Research paper



1. Introduction

The concept of social sustainability from a business perspective refers to the capability to fulfill basic human needs (Silvis, 2012) and companies' responsibility to monitor their social influences on all relevant stakeholders. Stakeholders' role in supporting social sustainability objectives is vital, especially in sectors such as the health-care industry, where the role of stakeholders extends to providing insights concerning the successful integration of sustainability (Marshall *et al.*, 2015). Despite this, social sustainability receives the least attention from researchers and practitioners (Mani *et al.*, 2016a), which indicates that a more people-oriented approach should be implemented (Holliday *et al.*, 2002).

Social sustainability has become one of the major concerns of supply chain managers, mainly due to pressure from stakeholders who demand responsible business practices within society (Carter and Jennings, 2002). Stakeholder theory states that companies should not disregard the impact or influence of various stakeholders (Phillips, 1997). In the health-care industry, these impacts are even greater, considering that health-care supply chains involve the human element in every stage (Santilli and Vogenberg, 2015; Hussain *et al.*, 2018). Therefore, studying social sustainability within a health-care supply chain is of critical importance.

In the United Arab Emirates (UAE), the health-care sector is witnessing structural changes intended to ensure equal access to efficient, sustainable and quality health-care services (Vision 2020, 2030). As a result, the system is changing fast in an attempt to adapt to the people's demands for preventive care (D'Mello, 2017). Although the country spent 2.9 per cent of the GDP on health care, the government is faced with the challenge of introducing a system that meets the health-care needs of its population (Capital Business, 2019), which is estimated to increase to 10.98 million people by 2030 (US-UAE Business Council, 2016). As the country aims to achieve a world-class health-care system (D'Mello, 2017), focusing more on social sustainability becomes a necessity in evaluating health-care facilities.

Despite this situation, literature concerning social sustainability falls short when compared to the literature available on the economic and environmental aspect of sustainability (Thin, 2002; Dempsey *et al.*, 2011; Vifell and Soneryd, 2012; Khan *et al.*, 2018a; Mani *et al.*, 2018), especially in terms of what hinders the successful implementation of social sustainability practices. The social dimension of sustainability has largely been emphasized only in terms of legislative issues, legal requirements, or human safety (Khan *et al.*, 2018b). However, more attention should be paid to the expectations and opinions of all parties who affect or are affected by issue of social sustainability. It is therefore important to shed light on the perspectives of stakeholders concerning the elements that make organizations socially sustainable. Although organizations are under pressure to implement socially sustainable practices (Ajmal *et al.*, 2018), the barriers concerning various stakeholders have not been methodically explored. Consequently, the focus of this study is to develop a structured approach (framework) that can be used to:

- identify the social sustainability barriers that are most relevant to health-care supply chains;
- organize these barriers into the standard categories of social sustainability barriers; and
- prioritize the identified social sustainability barriers categories and their sub-categories to facilitate effective social sustainability implementation.

The identification, categorization and prioritization of these barriers enables a structured and applicable social sustainability adoption framework that can be used by different

stakeholders in a health-care supply chain. The framework applicability was proven by a study conducted in selected health-care facilities in the UAE. The results of this study have several implications for the UAE health-care sector, which has a turnover of approximately US\$17bn annually (D'Mello, 2017) annually and will reach an estimated \$19.5bn by the year 2020 (US-UAE Business Council, 2016). The developed framework can be also adapted to health-care industries in different regions, and the study's findings can provide guidelines for the effective adoption of social sustainability practices across different health-care supply chains.

The remainder of this study is organized as follows: Section 2 provides a review of the relevant existing literature, Section 3 presents the proposed framework, and Section 4 presents the research framework. The analyses of the analytical hierarchical process (AHP) results are described in Section 5, followed by a discussion of the study implications in Section 6.

2. Literature review

2.1 Social sustainability

The concept of sustainability incorporates economic, environmental and societal objectives and concerns the triple bottom line (social, environmental and financial) of any business (Kleindorfer *et al.*, 2005; Carter and Rogers, 2008; Montalbán-Domingo *et al.*, 2018). Although organizations are urged to reach a balance among these three mutually important areas (Carter and Rogers, 2008), many companies have thus far focused almost exclusively on economic and environmental issues, largely disregarding the social ones (Shrivastava, 1995; Starik and Rands, 1995; Seuring and Muller, 2008). On the other hand, corporate social responsibility (CSR) describes the same phenomenon but fails to present solutions for the challenges within this phenomenon. Therefore, the challenge for companies is not to define CSR, but to comprehend how CSR is socially applicable to a specific setting and to consider this when corporate policies are being established (Dahlsrud, 2008).

However, companies are experiencing increasing pressure from various stakeholder groups to act responsibly toward the society (Maloni and Brown, 2006; Mani *et al.*, 2016c). The concept of social sustainability has emerged in response to the goals of global transformation and political agendas to help organizations attain their long-term objectives (Colantonio, 2009).

There have been many efforts in previous literature directed at defining the notion of social sustainability. However, these efforts have thus far failed to derive a generalized definition that reflects what the concept really is (Huq *et al.*, 2014). From a practical perspective, social sustainability involves fulfilling basic human needs such as human rights, health and safety, while taking into account environmental sustainability (Konovsky and Pugh, 1994; Huq *et al.*, 2014). From a business perspective, social sustainability entails focusing on business relationships with stakeholders, and how managing these relationships affects the social system (Labuschagne *et al.*, 2005).

The lack of a singular notion of social sustainability implies a gap in the literature that addresses the concept and its applications within the sustainable development discourse (Thin, 2002; Dempsey *et al.*, 2011; Vifell and Soneryd, 2012; Mani *et al.*, 2018). Literature shows a lack of focus on the concept of social sustainability, which is yet to be compared to both the economic and environmental dimensions of sustainability (Shrivastava, 1995; Starik and Rands, 1995; Seuring and Muller, 2008). Other researchers have also pointed out the gap in current literature pertaining to issues related to social sustainability integration into decision making processes (Visser and Sunter, 2002; Carter and Rogers, 2008; Seuring and Muller, 2008; Wu and Pagell, 2011). Therefore, more concentrated efforts are needed in

investigating social sustainability within a business context in general, particularly in supply chains (Maloni and Brown, 2006; Hussain *et al.*, 2018; Khan *et al.*, 2018a).

2.2 Social sustainability within supply chains

The impact of social sustainability extends beyond the focal company, influencing stakeholders inside and outside the supply chain (Ashby *et al.*, 2012). A supply chain is often viewed as a network of critical links that connects organizations (stakeholders) and links each organization's inputs to its outputs (Hussain *et al.*, 2016a). Therefore, focusing on supply chain practices is an effective way of addressing social sustainability adoption and development by creating a sense of urgency to integrate concepts from social sustainability into supply chains. (Linton *et al.*, 2007).

Stakeholders are pressurizing companies within supply chains to adapt transparent practices and reporting their social sustainability practices (Holliday *et al.*, 2002; Tate *et al.*, 2010). Despite these pressures, many companies' social efforts do not align with their organizational strategy (Porter and Kramer, 2006). Moreover, these efforts are often directed only at certain aspects of social sustainability, paying too little attention to the interrelations among those aspects (Carter and Jennings, 2002).

A significant number of existing studies on sustainability investigated issues related to social sustainability in developed regions (Carter and Jennings, 2002; Bai and Sarkis, 2010; Lu *et al.*, 2012; Miao *et al.*, 2012). Additionally, few authors have explored the topic of social sustainability practices and antecedents in a supply chain context (Pfeffer, 2010; Pullman and Dillard, 2010; Ehrgott *et al.*, 2011). This requires further investigation, particularly within service supply chains (Cherian *et al.*, 2010).

2.3 Social sustainability in a health-care supply chain

The health-care sector has responded to the rising call for prioritizing patients' health and the growing concerns concerning the quality of health-care services (de Vries and Huijsman, 2011; Hussain and Malik, 2016). Health-care services are sustainable when operated by an organizational system which is reinforced by sufficient resources and activities to meet individual and public health needs (Al Hammadi and Hussain, 2019).

Health-care supply chains involve processes that integrate a smooth and continuous flow of materials, information and services. The uniqueness of the health-care sector stems from the complexity of technologies, the multiple stakeholders within the health-care supply chain (De Vries and Huijsman, 2011), and the financial and informational flow, which play a critical role in the design of the supply chain (Singh *et al.*, 2006). Therefore, the application of supply chain practices in a health-care context is related to organizational aspects such as building relationships, allocating authorities and responsibilities and organizing interface processes (De Vries and Huijsman, 2011).

Many health-care organizations have already recognized the importance of adopting supply chain management practices. However, the uniqueness of health-care supply chain makes an industrial approach unsuitable to the health-care sector, which calls for an interdisciplinary focus on supply chain management issues in health-care services (De Vries and Huijsman, 2011). Accordingly, managing health-care supply chains incorporates aspects related to managing stakeholders' relationships and the allocation of resources across the chain (De Vries and Huijsman, 2011).

It is quite possibly due to the uniqueness of the health-care sector that literature in supply chain management has not yet turned its attention to this specialized service of supply chains. Field *et al.* (2018) merged numerous research fields in service supply into eight prominent themes, simultaneously recommending that extensive and impactful research

should be done to contribute to the enduring discussion on the role of service operations in value creation. The authors stated that service operations' researchers need to facilitate further insight in the field. This study is the response to that repeated demand.

It was stated that health-care service is sustainable only when it meets individual and public health needs through an organizational system reinforced with the sufficient resources and activities. Therefore, formulating health-care development strategies to promote accessibility should be based on peoples' needs and aspirations (Jana and Harata, 2016). The social sustainability of health-care facilities should reflect their ability to improve the quality of health care (Djukic and Marić, 2017). It is due to the uniqueness of the health-care sector that literature in supply chain management lags behind in turning attention to this kind of supply chain. Being a service type of supply chain makes an industrial approach not applicable, which calls for more focus on supply chain management issues in health services (de Vries and Huijsman, 2011).

2.4 Barriers of social sustainability

While many studies are dedicated to understanding whether social issues can be addressed within supply chains (Mani *et al.*, 2016b), some of these efforts highlight the barriers of sustainability in general as well as social sustainability in particular. Some researchers emphasize that economic and resource constraints as well as the misallocation of these resources inhibit organizational efforts toward improving community health (Pagell *et al.*, 2010; Walker and Jones, 2012; Dunphy, 2014). Constraints due to imposed laws, institutional policies and guidelines also impact sustainability practices. These constraints may influence the moral judgment of employees, who may experience a personal conflict between their personal values and their need to conform to organizational rules (Liu *et al.*, 2011; Dunphy, 2014). Jiang (2009) and Park-Poaps and Rees (2010) noted that even when laws are present, a lack of government support or law enforcement would lead to low commitment to sustainability.

Matters related to accountability and social reporting were noted in literature as obstacles to social sustainability. For example, Belal's (2002) study stated that social audit reports focus more on environmental matters than on social ones. Huq *et al.* (2014) found that immoral behavior by certain suppliers and an organization's ignorance of these violations is part of the problem, and Jiang (2009) pointed to audit fraud as major contributor to these behaviors. Furthermore, poor coordinative efforts and communication between various stakeholders in a health-care supply chain affect social sustainability implementation (Walker and Jones, 2012).

Additionally, Malik *et al.* (2016) emphasized that infrequent or unstable ordering practices by a health-care facility might cause issues with cashflow for suppliers, who rather than taking socially sustainable actions which require long-term investments would be more concerned about sustaining their own business. Another issue highlighted by existing literature is the poor engagement by stakeholders and an unwillingness in organizations to implement their feedback (Belal, 2002). Similarly, Berman *et al.* (1999) found that organizations involve their stakeholders only in issues related to organizational profitability and not in issues such as social sustainability.

Organizational culture is a common barrier to sustainability within health-care practices especially when the organization's codes of conduct and local culture disagree (Jiang, 2009; Walker and Jones, 2012; Dunphy, 2014). Marshall *et al.* (2015), for example, found that a weak sustainability culture will hinder the monitoring of practices. Moreover, organizational structure, business processes and systems may act as obstacles to sustainability if they are more aligned with increasing capacity and professionalism than with developing a long-

term relationship with community partners who have a responsibility to improve the health of local citizens.

There may be a misperception and a lack of awareness among management and stakeholders about the true definition and purpose of sustainability and about their roles in furthering sustainability (Carter and Rogers, 2008). A lack of training and education within organizations to take sustainably responsible actions and a lack of support in the workplace were highlighted as possible limitations to sustainability practices (Walker and Jones, 2012; Dunphy, 2014). Moreover, management also lacks basic knowledge concerning CSR (Jiang, 2009), and efforts should be made to raise awareness regarding the importance of sustainability in general and social sustainability in particular.

3. Theoretical framework – stakeholder theory

The stakeholder theory states that companies are multi-actor relationship entities (Frooman, 1999) that need to respond to shareholders' expectations as well as the best interests and demands of many other groups and individuals who have the ability to influence their organizational objectives (Freeman, 1984; Wartick and Wood, 1998). In the health-care industry, stakeholders with such influence include patients/community, employees (Sarkis *et al.*, 2010; Hussain *et al.*, 2018), suppliers, competitors, governments, media (Friedman and Miles, 2006; Yawar and Seuring, 2017) and creditors (Font *et al.*, 2016). Managing stakeholders within supply chains have never been more important, especially in view of the fact that the workflow of these chains depend upon the relationships among different internal and external stakeholder groups.

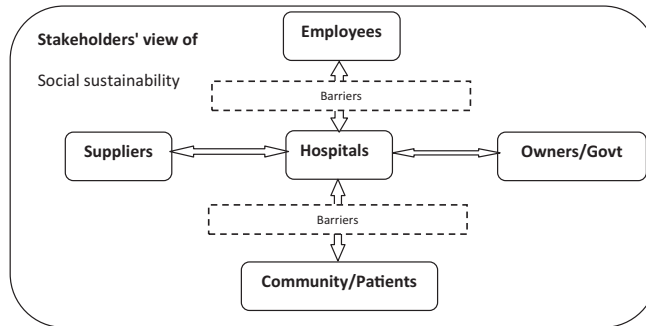
Although stakeholder theory provides a useful framework for analyzing the interrelationships between organizations, groups and individuals within a supply chain, managing a supply chain with these interrelationships is not an easy task (Moretto *et al.*, 2018), considering the complex nature of the influence that stakeholders possess (Meixell and Luoma, 2015). One of the major demands that stakeholders are calling for – besides economic benefit – is for companies to act responsibly toward the environment and the societies where they operate (Meixell and Luoma, 2015). This means that sustainability is a major organizational objective and a response to the demands of stakeholders. (Black and Hartel, 2003; Liu *et al.*, 2011). Although the concept of sustainability has been investigated in manufacturing supply chains, the notion has recently starting gaining attention pertaining to service supply chains (Hussain *et al.*, 2016a; Khan *et al.*, 2018c).

Social sustainability in particular has garnered a lot of attention, pressurizing supply chain managers to assess the social impact of their organization on the communities where they operate (Carter and Jennings, 2002; Hutchins and Sutherland, 2008). The current shift in stakeholder pressure from environmental issues to social issues have increased the need for a more people-oriented approach (Pullman and Wikoff, 2017). This is particularly important in service supply chains such as health care, where the human element is part of every stage (Santilli and Vogenberg, 2015).

There have been several studies on social sustainability pertaining to supply chains (Lu *et al.*, 2012; Miao *et al.*, 2012), but these studies were performed in developed countries. Additionally, only a small number of studies have investigated social sustainability practices in supply chains (Ehrgott *et al.*, 2011; Hussain *et al.*, 2018), which is another reason for a more thorough investigation of the topic within supply chains, particularly in the service and health-care industries (Khan *et al.*, 2018a).

The conceptual framework (shown in Figure 1) is based on a number of propositions. First, although existing literature used the stakeholder approach to address social and environmental issues across supply chains (Mohsen *et al.*, 2014), the theory is restricted to a

Figure 1.
Research conceptual
framework



manufacturing context in developed, Western regions (Angeleanu *et al.*, 2016). Second, health-care facilities have realized the need to consider the priorities of their stakeholders (Ali, 2013) and the importance of involving their stakeholders (Santilli and Vogenberg, 2015) to achieve their organizational goals. We propose that health-care facilities can enhance their potential to achieve sustainability by integrating concepts from the stakeholder theory, which requires an active interaction between health-care facilities and stakeholders (Huq *et al.*, 2014) who may provide insight into the successful integration of sustainable practices (Marshall *et al.*, 2015). Third, following previous researchers' recommendations to consider the complete set of stakeholders (Donaldson and Preston, 1995; Doloi, 2012; Angeleanu *et al.*, 2016), we believe that this study is among the first to draw on the theory to mutually address both stakeholders' role and their interests, aiming to integrate from a social perspective all health-care stakeholders to discover what inhibits social sustainability. This is especially important, since the available literature fails to address the connections between stakeholders' interests and their expectations. (Grembowski *et al.*, 2002; Esmaeilzadeh *et al.*, 2013; Piening *et al.*, 2013; Huibin, 2014; Santilli and Vogenberg, 2015). Moreover, as the theory in this study addresses the awareness, adoption and implementation of social sustainability, as well as overcoming institutional barriers and gaps between companies and communities (Gold *et al.*, 2013; Meixell and Luoma, 2015), the theory is useful in exploring the factors that hinder social sustainability practices.

4. Research framework

4.1 Exploration of social sustainability barriers

This study aims to identify, categorize and prioritize the barriers of social sustainability in health-care supply chains. The objective is to discover and address the factors that inhibit social sustainability within this growing service industry, with the main goal being to overcome these barriers and facilitate the implementation of successful social sustainability. To fulfill the research objectives, specific research methods are developed. This study was conducted in two phases. Phase 1 entailed designing an exploratory survey and distributing it to the top ten UAE-based health-care facilities selected by the researchers. These health-care facilities were selected from a list from the Emirates Health Authority (EHA), and they are well-versed on the concept of social sustainability. These facilities' annual reports showed that they have implemented and are maintaining high standards of social sustainability, not only concerning their employees but also concerning the community and other stakeholders.

The survey was structured according to the framework shown in Figure 1. The first section of the survey addressed general information and the remaining four sections

explored the barriers of social sustainability from the perspectives of health-care suppliers (procurement department), health-care employees, customers (patients and community) and owners/governments. A similar exploratory approach was used by other researchers (Al-Amor and Hussain, 2017; Hussain *et al.*, 2018; Al-Amor and Hussain, 2018a). Fifty-five senior managers and directors – with more than ten years' experience each in the health-care sector – were shortlisted from the selected health-care facilities to take part in the survey. They were purposively selected from various departments including procurement/purchasing, operations, supply chain, customer relations and strategic management. An attempt was made to ensure equal representation of respondents related to each stakeholder group. It is important to note that data pertaining to suppliers were collected from the procurement/purchasing departments of the health-care facilities. Procurement departments work closely with suppliers, develop sustainable supplier selection criteria and are aware of the barriers faced by suppliers concerning social sustainability. Additionally, first-tier suppliers often recommend strategies to procurement departments for improving social sustainability standards and vice versa.

The 55 shortlisted senior managers and directors were contacted telephonically and briefed about the purpose and scope of the research. Of those shortlisted, 37 agreed to participate and provided their email addresses. Questionnaires were emailed to these participants and a reminder was sent two weeks later. A total of 30 responses were received over a period of four weeks. Meanwhile, a list of 18 mid-level and senior managers from UAE health-care regulatory authorities – including Health Authority-Abu Dhabi, the Dubai Health Authority and the EHA – was compiled. These experts were also contacted telephonically, and 13 of them agreed to participate, upon which they received questionnaires via email. Of these questionnaires, ten responses were received and used in this research. A total sample of 40 respondents were used in this research which is a healthy number for this kind of exploratory research (Al-Amor and Hussain, 2017; Al-Amor and Hussain, 2018b).

Phase 1 resulted in the identification of 72 barriers of social sustainability for four main stakeholders in health-care supply chains as shown in Table I. These results were reached after eliminating repetitive responses and grouping the responses that relate to the same concept. The final list of barriers includes 18 factors identified by suppliers, 18 by patients, 22 by employees and 14 by the government/owners.

4.2 Development of analytical hierarchical process model (Phase 2)

To develop the framework, the list of social sustainability barriers shown in Table I was shortened to 34 unique items by removing commonalities. These 34 practices were then grouped into five main barriers criteria (categories): poor infrastructure, organizational culture, poor coordination, stakeholder disparity and uncertainty (Khan *et al.*, 2018b). This classification was based mainly on the type or nature of each barrier and its relevance to the standard categories of barriers. The classification of the barriers was also tested for content validity using discussions and interviews with academics as well as senior managers of purchasing, customer relations, human resources, operations and supply chain and relationship management departments of four health-care facilities. These four health-care facilities were randomly selected from already shortlisted top ten health-care facilities. Based on their feedback, a number of these barriers were adjusted and shifted to the appropriate categories.

The hierarchal structure of the developed AHP model includes main criteria and sub-criteria of the identified social sustainability barriers. The five categories mentioned above represent the main criteria and the practices within each main category represent the sub-criteria. In the next step, the main criteria and sub-criteria were organized into a hierarchical structure as shown in Figure 2. The highest level of the hierarchy represents the overall goal, which is to

Table I.
Stakeholders' views
of social
sustainability
barriers in health
care

Suppliers	Community/patients	Employees	Government/owners
Buyer–supplier exchange issues	Availability and scope of service	Communication barriers	Conflict of interests
Changing business environment	Communication and feedback barriers	Conflict in interests	Cost pressure
Communication barriers	Conflict of stakeholders interests	Cost pressure	High competition and external pressure
Cost pressure	Cost pressure	Cultural differences	Image and reputation
Demand issues	Cultural barriers	Employees' dissatisfaction	Lack of consensus and cooperation
High competition	High competition	High competition	Lack of innovation
Lack of accountability and social audit	Lack of awareness and engagement	Lack of awareness	Lack of knowledge
Lack of awareness and knowledge	Lack of innovation and research	Lack of engagement	Lack of organizational commitment to sustainability
Lack of commitment to sustainability	Lack of organizational commitment to sustainability	Lack of innovation and research	Perception toward sustainability
Lack of coordination and collaboration	Perception toward sustainability	Lack of knowledge and efficiency	Policies and regulations
Lack of resources	Policies and regulations	Lack of organizational commitment to sustainability	Poor corporate structure and processes
Lack of training and experience	Poor corporate structure and processes	Lack of training	Poor customer service
Organizational culture and design	Poor customer service	Low flexibility	Poor management and leadership support
Perception toward sustainability	Profitability focus	Organizational culture and ethics	Resources limitation
Policies and regulations	Quality issues	Perception toward sustainability	
Poor risk management capabilities	Resistance to change	Policies and regulations	
Profitability focus	Resource limitation	Poor corporate structures and processes	
Quality issues	Uncertainty of demand	Poor management and leadership support	
		Resistance to change	
		Resource limitation	
		Shortage of skills	
		Substandard working conditions	

rank the social sustainability barriers that are most relevant in health-care supply chains. To illustrate common manifestations of the AHP model, the five main categories were represented as the criteria in Level 2, and each specific sub-barrier is represented by Level 3 (sub-criteria).

4.3 Prioritizing the barriers of social sustainability

As emphasized earlier, it is essential to determine the priorities of the selected barriers for effective and successful management within the research model. The AHP model expresses the social sustainability priority in terms of a set of relative importance weights for the five social sustainability barrier categories and the sub-barriers within each category. The model

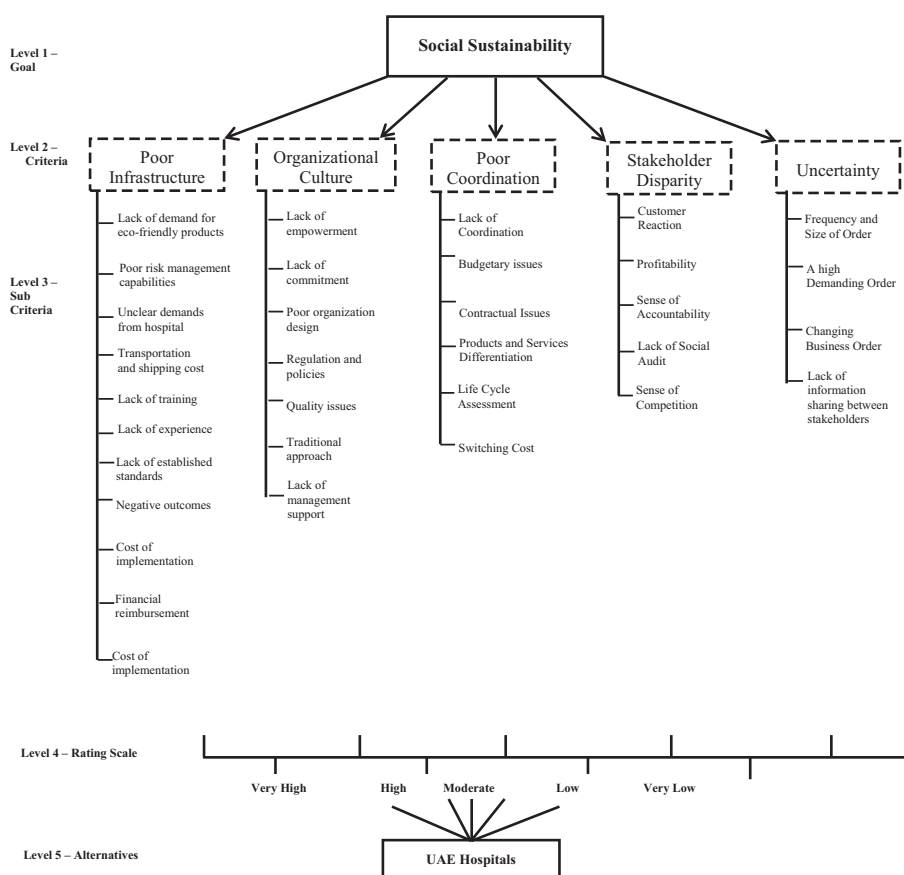


Figure 2.
AHP model for
prioritizing social
sustainability
motivators

provides a comprehensive and rational framework for structuring the barriers of social sustainability, representing and quantifying their elements, relating those elements to the overall goal and evaluating the alternative solutions.

Experts from selected health-care facilities were selected to provide the input information (pairwise comparisons) for the AHP analysis. To address the entire supply chain within the health-care industry, the group of experts included 16 administrators from the relevant health-care departments (procurement, operations, administration, human resources and customer management). The respondents were selected by purposive sampling to ensure adequate discipline and experience. Consequently, expert opinions from the 16 respondents from seven different health-care facilities were collected via in-depth interviews. Their judgments were used to establish the pair-wise comparison matrices in the AHP model. The sample size of 16 respondents is satisfactory, considering that a small sample size from the AHP methodology perspective is acceptable (Cheng and Li, 2001).

The experts were asked to evaluate the various barriers contained in the AHP model by comparing those barriers to each other two at a time (pairwise comparison) pertaining to their impact on the main criteria in the hierarchy. In making the comparisons, the experts

rely on concrete data available about the elements and use their own judgment about the elements' relative meaning and importance.

The AHP model converts these evaluations to numerical values (Saaty's 1-9 scale) that can be processed and compared across the entire range of criteria and sub-criteria. Therefore, the questionnaire was developed using Saaty's 1-9 scale, as shown in Table II, and pair-wise comparisons of social sustainability barriers criteria and sub-criteria were then made by each of the 16 experts. For example, if a respondent opines that "organizational culture" is relatively more important than "uncertainty," the former is rated 3, while the latter is rated as 1/3. The other barrier criteria and sub-criteria were rated following a similar approach. The numerical weight or priority is derived for each element of the hierarchy, allowing diverse and often disproportionate elements to be compared to each other in a rational and consistent way.

Following Saaty's (2008) suggestion, the geometric mean approach was used (rather than the arithmetic mean) to combine the individual pairwise comparison judgments of the 16 experts into a pairwise comparison matrix. To check the consistency of the comparisons, a Consistency Index (CI) was applied to each pairwise comparison matrix. Saaty (1980) defined the consistency index as follows:

$$CI = (\lambda_{\max} - n) / (n - 1) \tag{1}$$

where $\lambda_{\max}$ is the Maximum Eigenvalue of the matrix of the importance ratios and n is the number of factors. Next, the Consistency Ratio (CR) was used to assess whether the matrices were sufficiently consistent. CR was determined as the ratio of the CI to a Random Index (RI):

$$CR = CI / RI \tag{2}$$

Random pair-wise comparisons were simulated to produce average random indices for different sized matrices. The values of RI are shown in Table III. According to Saaty (2008), if the CR value is smaller or equal to 0.10, the inconsistency in the experts' judgments is acceptable.

Table II.
The 1 to 9 scale for
AHP pair-wise
comparison

Intensity of importance	Definition	Explanation
1	Equal importance	Two criteria contribute equally to the objective of waste reduction
3	Moderate importance	Judgment slightly favor one over another
5	Strong importance	Judgment strongly favor one over another
7	Very strong importance	A criterion is strongly favored and its dominance is demonstrated in practice
9	Absolute importance	Importance of one over another affirmed on the highest possible order
2,4,6,8	Intermediate values	Used to represent compromise between the priorities listed above

Table III.
Random index

n	1	2	3	4	5	6	7	8	9	10
RI	0.00	0.00	0.58	0.90	1.12	1.24	1.32	1.41	1.45	1.48

Note: n is number of factors

5. Analytical hierarchical process results

As illustrated in Section 4, a pair-wise comparison matrix of the five main categories of social sustainability barriers (main AHP criteria) was established based on the judgments of 16 health-care industry experts. The opinions of the experts were acceptable/reliable in case of the AHP analysis, which mediates survey fatigue (Hussain *et al.*, 2016b; Aljaberi *et al.*, 2018). Table IV presents the geometric means of the pairwise comparisons of the five main social sustainability criteria. After completing the 5×5 pair-wise comparison, we apply the AHP method to determine the weights of relative importance for each criterion (the priority vector of Table IV). Saaty (1980) used the “Consistency Principle” for calculating the priority vector. The consistency principle is estimated as $a_{ik} = a_{ij} \cdot a_{jk}$. The subsequent arguments for using the special case of the consistency matrix are formed by elements $a_{ik} = w_i / w_j$, where w_i and w_j are the elements/weights of the priority vector corresponding to criteria i and j .

Based on the weight values of the priority vector in Table IV, “Organizational Culture” was found to be the most relevant group of social sustainability barriers in the surveyed dataset, with an overall relative importance (priority) weight of 46 per cent. This also indicates that the set of barriers within this category (lack of empowerment, lack of commitment, poor organizational design, regulations and policies, quality issues, traditional approach, lack of management support) were the most influential in inhibiting a social sustainability culture in health-care facilities.

The next barrier category is “Poor Coordination,” with a priority weight of 19 per cent. Similarly, the set of inhibiting practices within the category were reported as the reasons for the lack of coordination throughout the health-care supply chain. These two categories represent 65 per cent of the barriers noticed within the data set. “Uncertainty” and “Poor Infrastructure” received close values of priority weights with 16 and 15 per cent, respectively. Finally, “Stakeholder Disparity” received the smallest priority weight value at 4 per cent. Accordingly, the barriers within these categories have the least relevance to the social sustainability issues within supply chains of the surveyed health-care facilities. Finally, the consensus responses in Table IV noticeably fulfil an acceptable CR requirement of the AHP model with a CR value of 9 per cent.

To gain a better understanding of the priority weights reported in Table IV for the main barrier categories, a similar approach was taken to establish a pairwise comparison of the sub-criteria or sub-barriers within each category. Prioritizing these barriers within each main category is essential for a more accurate result, leading to more effective social sustainability implementation. Evidently, these sub-barriers are the ones to be dealt with – not the main categories – and setting the right priority would assist stakeholders in the health-care supply chain to efficiently allocate time and financial resources to address each of them. The AHP results for the five pairwise matrices are presented in Table V.

Criteria	Poor infrastructure	Org. culture	Poor coordination	Stakeholder disparity	Uncertainty	Priority vector
Poor infrastructure	1	1/6	1/8	3	6	0.15
Org. culture	6	1	7	7	6	0.46
Poor coordination	8	1/7	1	5	1/5	0.19
Stakeholder disparity	1/3	1/7	1/5	1	1/5	0.04
Uncertainty	1/4	1/6	5	5	1	0.16
						CR value = 0.09 (consistent)

Table IV.
Geometric means of
pair-wise comparison
of main criteria

Table V.
Geometric means of
pair-wise comparison
of sub-criteria

Geometric means of pair-wise comparison of sub-criteria (Poor infrastructure)												
Criteria	1	2	3	4	5	6	7	8	9	10	11	Priority vector
Lack of demand for eco-friendly products	1	1/6	1/6	1/6	1/5	1/5	1/5	5	4	4	1/7	0.04
Poor risk management capabilities	6	1	6	7	7	7	7	7	7	7	7	0.28
Unclear demands from hospital	6	1/6	1	5	1/6	1/6	1/6	4	4	4	1/5	0.06
Transportation and shipping cost	6	1/7	1/5	1	1/5	1/5	1/6	1/4	1/4	1/5	1/6	0.03
Lack of training	5	1/7	6	5	1	1/4	1/4	5	5	5	5	0.11
Lack of experience	5	1/7	6	5	4	1	4	4	5	5	1/7	0.13
Lack of established standards	5	1/7	6	6	4	1/4	1	5	5	5	6	0.14
Negative outcomes	1/5	1/7	1/4	4	1/5	1/4	1/5	1	1/4	3	1/5	0.03
Cost of implementation	1/4	1/7	1/4	4	1/5	1/5	1/5	4	1	5	1/6	0.04
Financial reimbursement	1/4	1/7	1/4	5	1/5	1/5	1/5	1/3	1/5	1	1/6	0.02
Safety issues	7	1/7	5	6	1/5	7	1/6	5	6		1	0.12
CR Value: 0.09 < 0.10 (consistent)												
Geometric means of pair-wise comparison of sub-criteria (Org culture)												
Criteria	1	2			3	4	5	6				Priority vector
Lack of empowerment	1	1/5			4	2	5	5	6		7	0.12
Lack of commitment	5	1			5	4	4	5	5		1/6	0.20
Poor organization design	1/4	1/5			1	1/3	3	5	5		1/8	0.06
Regulation and policies	1/2	1/4			3	1	5	5	5		1/7	0.10
Quality issues	1/5	1/4			1/3	1/5	1	6	6		1/8	0.05
Traditional approach	1/5	1/5			1/5	1/5	1/6	1	1		1/9	0.02
Lack of management support	6	6			8	7	8	9			1	0.45
CR value: 0.09 < 0.10 (consistent)												
Geometric means of pair-wise comparison of sub-criteria (Poor coordination)												
Criteria	1	2			3	4	5	6				Priority vector
Lack of coordination	1	8			8	8		5			6	0.45
Budgetary issues	1/8	1			4	4		1/6			5	0.12
Contractual issues	1/8	1/4			1	1/5		1/5			1/5	0.03
Products and services differentiation	1/8	1/4			5	1		1/6			5	0.09
Life cycle assessment	1/7	6			5	6		1			8	0.24
Switching cost	1/3	1/5			5	1/5		1/8			1	0.07
CR value: 0.01 < 0.10 (consistent)												
(continued)												

<i>Geometric means of pair-wise comparison of sub-criteria (Stakeholder disparity)</i>					
Criteria	1	2	3	4	5
Customer reaction	1	5	1/8	7	8
Profitability	1/5	1	1/5	1/8	1/8
Sense of accountability	8	5	1	3	8
Lack of social audit	1/7	8	1/3	1	1/9
Sense of competition	1/8	8	1/8	9	1
CR value: 0.02 < 0.10 (consistent)					
<i>Geometric means of pair-wise comparison of sub-criteria (Uncertainty)</i>					
Criteria	1	2	3	4	Priority vector
Frequency and size of order	1	1/7	1/6	2	0.18
A high demanding order	7	1	1/7	1/6	0.15
Changing business order	6	7	1	1/9	0.26
Lack of information sharing between stakeholders	1/2	6	9	1	0.41
CR value: 0.06 < 0.10 (consistent)					

Table V.

Table V shows the priority weights of the consensus pair-wise comparison for the sub-criteria in the “Poor infrastructure” category. The experts from the UAE health-care facilities assigned the highest priority to poor risk management capabilities (28 per cent), followed by the lack of established standards (14 per cent). In the health-care industry, not having clear guidelines and instructions in place for addressing risks and other issues related to the supply chain practices affects the implementation and the commitment to social practices negatively. On the other hand, the health-care experts interviewed gave financial reimbursement a low priority (2 per cent) as a social sustainability barrier related to poor infrastructure. Table V also shows that the “Poor infrastructure” sub-criteria weight assessment meets the AHP consistency requirement with a CR of 9 per cent.

Also presented in Table V are the pair-wise comparisons of the seven sub-criteria within the “Organizational Culture” category. The priority vector shows that a lack of management support has the highest priority weight at 45 per cent, and lack of commitment has the second highest priority at 20 per cent. These two practices – that collectively represent 65 per cent of the total weight – were found to be most influential obstacles for implementing social sustainability within the supply chains of the surveyed health-care facilities. Traditional approach was found to have the least relevance within this category with a relative importance weight of only 2 per cent. The CR value of 9 per cent indicates an acceptable consistency of the matrix.

Next, the table provides the priority weights of the consensus pair-wise comparison for the “Poor Coordination” sub-criteria. The experts assigned the highest priority to lack of coordination (45 per cent) followed by life cycle assessment (24 per cent). The next priority is given to budgetary issues (12 per cent) and products and services differentiation (9 per cent). Other practices like switching cost and contractual issues were found to be of least importance. The poor coordination sub-criteria weights assessment meets the AHP consistency requirement with a CR value of 1 per cent.

The priority weights of the consensus pairwise comparison for the “Stakeholder Disparity” sub-criteria are shown as well. The experts assigned the highest priority to sense of accountability (44 per cent), followed by customer reaction (23 per cent) and sense of competition (18 per cent). Profitability was found to be of least importance with only a 4 per cent weight. This confirms that disagreements and variances among the stakeholders within health-care supply chains inhibit social sustainability practices. The “Stakeholder Disparity” sub-criteria weights assessment meets the AHP consistency requirement with a CR of 2 per cent.

Finally, the priority listing of the consensus pairwise comparison for the “Uncertainty” sub-criteria is also presented in the table. High priority was given to the lack of information sharing between stakeholders (41 per cent), followed by changing business orders (18 per cent). The “Uncertainty” sub-criteria weights assessment also meets the AHP consistency requirement with a CR value of 6 per cent.

Although the pairwise comparison analyses provide a detailed assessment of the barriers outlined by the health-care managers, the question is whether these results would be equally accurate for all the stakeholders, for instance patients/community, employees, suppliers, competitors, government/regulators, media and creditors. It is quite obvious that social sustainability policies and initiatives concern all stakeholders and are greatly influenced by organizational structure, poor coordination, uncertainty, poor infrastructure and disparity. For example, previous literature proved that inadequate information sharing (poor coordination) among the stakeholders involved (suppliers, employees, customers/patients and governments) always lead to chaos, inefficiency and poor strategy implementation. In other words, each stakeholder may have a different set of weights for main and

sub-categories concerning the barriers of social sustainability, based on their own vision and position within the supply chain. This limitation can possibly be addressed in a future study by revisiting the same barriers for a single type of stakeholder in health-care and/or service organizations.

6. Discussion

6.1 Discussion and conclusion

This study is based on the observations of senior managers from the health-care industry who are able to accurately surmise the perceptions of their stakeholders. These managers deal with their respective clients daily and are in a position to accurately describe their own assessments – as well as those of their stakeholders – pertaining to social sustainability. Considering the limited existing literature concerning social sustainability practices and their antecedents (Pfeffer, 2010; Pullman and Dillard, 2010; Ehrigott *et al.*, 2011), this study explores the barriers or factors that inhibit the adoption and implementation of social sustainability practices within health-care supply chains. The focus of this study is to explore, categorize and prioritize the barriers of social sustainability across health-care supply chains. To this end, the study consists of two phases. The first phase was aimed at exploring the barriers concerning various stakeholders using a simple data collection template. Based on the results of this phase, an AHP was used to prioritize the identified barriers. The AHP transformed the comparisons – which were mostly empirical – into numerical values that are further processed and compared. The priority weight of each factor allowed an assessment of each element inside the defined hierarchy.

The exploratory phase shortlisted 34 social sustainability barriers perceived by the interviewed health-care experts from selected health-care facilities. The experts' opinions were then used to group the 34 barriers into five categories based on their relevance to social sustainability implementation in health-care facilities by an exploratory factor analysis (Khan *et al.*, 2018b). These categories were poor infrastructure, organizational culture, poor coordination, stakeholder disparity and uncertainty. This categorization aided in emphasizing the social sustainability issues in health care and further characterizing its sustainability strategies. Therefore, health-care management can address each individual issue related to its category by implementing initiatives that focus on the areas in need of improvement to thereby promote social sustainability throughout the supply chain.

An AHP with input from health-care industry experts was used to prioritize the categories and sub-categories of barriers related to social sustainability implementation to establish the pair-wise comparisons of the AHP. The results provided an assessment of the current status of social sustainability within the health-care supply chains of the surveyed facilities.

The results revealed three priority levels for the categories of barriers inhibiting social sustainability. The first level – “Organizational Culture” – received the highest priority weight of relative importance in AHP results. This emphasizes the importance of shared assumptions, values and beliefs that influence people's behavior within organizations, and the priority of having in place a culture that fosters socially sustainable behavior. The second level contained “Poor Coordination,” “Uncertainty” and “Poor Infrastructure,” which emphasizes the need for suitable management, supportive policies, and guidelines within the supply chain to increase the level of coordination among relevant stakeholders and to ensure that they are capable of dealing with uncertainties when the need arises. The third level included “Stakeholder Disparity,” showing that disagreements and varying opinions among stakeholders affect social sustainability negatively. Finally, it is worth mentioning that the relative importance of each social sustainability category determined in this phase

demonstrates its relevance to the industry and will contribute to setting priorities concerning initiatives that can effectively mitigate and overcome such barriers.

To address the determined barriers and reduce their impact on the social sustainability agenda, it is essential to investigate the problems that are most relevant and highly prioritized by management. The AHP results also provided the relative importance weights for the sub-barriers within each category.

Within the “Poor infrastructure” category, the AHP results showed that poor risk management capabilities as well as lack of established standards were the most relevant. This highlights the need for health-care facilities to establish sustainable systems and policies that facilitate social sustainability implementation. In the “Organizational Culture” category, the AHP results showed that lack of management support and lack of commitment were most relevant. This points to the importance of adopting to a culture within health-care supply chains that fosters sustainability. For the “Poor Coordination” category, priority was given to lack of coordination and life cycle assessment. The priority weight of these practices emphasizes the need to build relationships and trust between different stakeholders throughout a supply chain. In the “Stakeholder Disparity” category, the priority was given to the sense of accountability and customer reaction. This suggests that managing stakeholders is critical to minimizing any potential detrimental impact on the supply chain. Finally, for the “Uncertainty” category, priority was given to lack of information sharing between stakeholders and changing business orders, which means that taking a proactive approach to deal with emerging issues in a supply chain is crucial.

To create an integrated roadmap for mitigating the impact of the five barriers for social sustainability, an all-inclusive relative priority for the 34 sub-barriers was developed. This was accomplished by simply multiplying the sub-criteria weights within each social sustainability category with the overall category weight. For example, the overall relative importance weight for the “lack of management support” sub-barrier was estimated as $0.45 \times 0.46 = 20.7$ per cent. Consequently, a Pareto chart of the overall priority for the 34 sub-barriers was developed, as shown in Figure 3.

The chart in Figure 3 shows that lack of management support is the biggest sub-barrier in a health-care supply chain. This signifies an important issue in social sustainability practices, as employees look toward their managers as their leaders and role models when

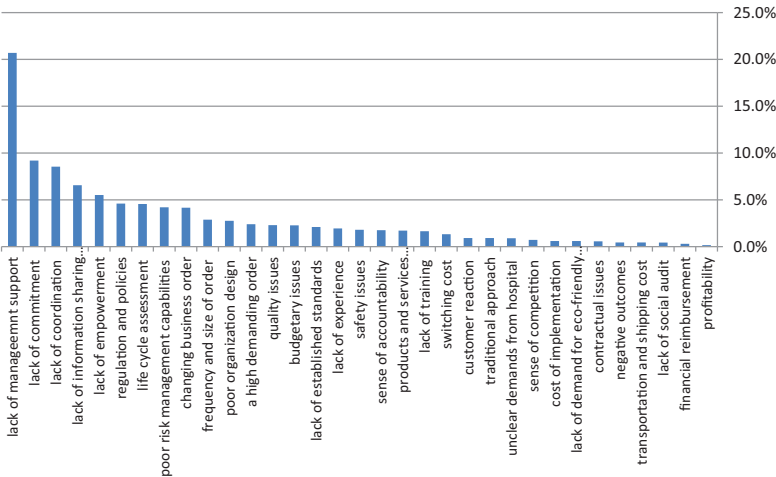


Figure 3.
Overall priority of
sub-criteria (sub-
barriers)

adapting to a new practice or initiative. Therefore, it is crucial for management and leadership to provide employee support to drive the change. The second priority is given to attitude, lack of commitment and lack of coordination, which health-care managers also view as obstacles to social sustainability adoption. The third priority is given to lack of information sharing between stakeholders and lack of empowerment.

Figure 3 is a representation of the final implementation plan of a supply chain-wide social sustainability program based on the mitigating initiatives to be undertaken to address the five main barriers. Such a plan should first focus on those barriers with higher impact or priority. Pareto's 80-20 rule can be used to differentiate the barriers with the highest impact.

As an example, a social sustainability implementation program can start by checking the status of the top ten barriers within a particular health-care supply chain. A gap analysis and a benchmarking study can then be used to implement an effective mitigation plan to overcome these barriers. The barriers specified in this study were viewed by experts as the most relevant ones to a health-care supply chain, and overcoming them is therefore expected to lead the best results in terms of organizational culture, infrastructure and coordination, among others. The remaining barriers can be incrementally dealt with but should not be ignored.

6.2 Study implications and limitations

The AHP results in Tables IV and V, and the Pareto chart in Figure 3 offer insights to social sustainability researchers as well as supply chain experts in health-care facilities. It can also serve as a roadmap for practitioners to implement an effective social sustainability plan across a health-care supply chain. Pertaining to the literature, this study's methodology addressed a research gap that was not previously fully investigated, which are the identification, categorization and prioritization of barriers across the entire health-care supply chain. In terms of practitioners, the identification of social sustainability barriers may raise awareness regarding issues that inhibit social sustainability across health-care supply chains.

Categorizing these barriers can assist practitioners in organizing and directing initiatives across the health-care supply chain to identify areas for improvement. Furthermore, the AHP set the priorities of main barriers that need urgent intervention and the specific sub-barriers within each category, which can be addressed according to their respective priority weights. Finally, the Pareto chart provides a visual representation of the ranking according to priorities of all the sub-barriers in terms of their relevance to social sustainability implementation. This prioritization will enable supply chain practitioners to allocate the resources (such as budget, work schedule, human resources and time) needed to overcome these issues and facilitate the successful implementation of social sustainability across the health-care supply chain.

Regarding the implications for the UAE health-care industry, the health-care sector is under severe pressure to provide high-quality services (Bell, 2016), especially relating to the government's vision to achieve a world-class health-care system and feature among leading countries in terms of quality of national health care (Vision2021, 2010). This study's findings can therefore help the local health-care industry to achieve their objectives by overcoming social sustainability barriers. Overcoming these barriers would facilitate the implementation of social sustainability programs that can positively contribute to the overall supply chain sustainability.

Finally – although the findings were primarily derived from a group of selected health-care facilities in the UAE – the research methodology can be applied to different contexts and may provide guidelines for the health-care industry in general. It is important to note,

however, that results in terms of the identified priorities for specific barriers may vary due to experts' judgments within the AHP pair-wise comparison matrices.

This study has certain limitations. First, the categorization of the social sustainability barriers was accomplished based on previous studies. Additionally, the reliability of these categories depends on the expertise of respondents in the data sample and the comprehensiveness of the collected data. We believe that further exploration of the subject material using a large population sample may arguably lead to different results. Second, for the purposes of our study, we assumed that the interviewed health-care managers represent the case of different stakeholders. However, collecting data directly from suppliers, community and government officials may also lead to different and innovative insights. Third, this study ranked various categories and sub-categories of barriers to social sustainability using an AHP method across UAE health-care system. The study's context and the application of other research methods are also limitations to this work. Future research can possibly investigate the scope of the impact imposed by these barriers on social sustainability implementation throughout supply chains of health-care facilities both in the UAE and globally. Finally, future research can also explore the impact of the identified barriers on the overall performance of the health-care supply chain, as well as how the pairwise comparison of the barriers is suitable for a single type of stakeholder.

References

- Ajmal, M.M., Khan, M., Hussain, M. and Helo, P.T. (2018), "Conceptualizing and incorporating social sustainability in the business world", *International Journal of Sustainable Development and World Ecology*, Vol. 25 No. 4, pp. 327-339.
- Al-Amor, R. and Hussain, M. (2017), "An assessment of green practices in a hotel supply chain: a study of UAE hotels", *Journal of Hospitality and Tourism Management*, Vol. 32, pp. 71-81.
- Al-Amor, R. and Hussain, M. (2018a), "An assessment of adopting lean techniques in the construct of hotel supply chain", *Tourism Management*, Vol. 69, pp. 553-565.
- Al-Amor, R. and Hussain, M. (2018b), "Exploration and prioritization of lean techniques in a hotel supply chain", *International Journal of Lean Six Sigma*, available at: <https://doi.org/10.1108/IJLSS-10-2017-0119>.
- Al Hammadi, F. and Hussain, M. (2019), "Sustainable organizational performance: a study of health-care organizations in the United Arab Emirates", *International Journal of Organizational Analysis*, Vol. 27 No. 1, pp. 169-186.
- Ali, M.M. (2013), "Healthcare service quality: towards a broad definition", *International Journal of Health Care Quality Assurance*, Vol. 26 No. 3, pp. 203-219.
- Aljaberi, O.A., Hussain, M. and Drake, P.R. (2018), "A framework for measuring sustainability in healthcare systems", *International Journal of Healthcare Management*, available at: <https://doi.org/10.1080/20479700.2017.1404710>.
- Angeleanu, A., Keppler, T. and Eidenmüller, T. (2016), "Effective stakeholder management in international supply chain projects", *International Conference on Management, Leadership and Governance, Kidmore*, pp. 9-16.
- Ashby, A., Leat, M. and Hudson-Smith, M. (2012), "Making connections: a review of supply chain management and sustainability literature", *Supply Chain Management: An International Journal*, Vol. 17 No. 5, pp. 497-516.
- Bai, C. and Sarkis, J. (2010), "Integrating sustainability into supplier selection with grey system and rough set methodologies", *International Journal of Production Economics*, Vol. 124 No. 1, pp. 252-264.

- Belal, A.R. (2002), "Stakeholder accountability or stakeholder management: a review of UK firms' social and ethical accounting, auditing and reporting (SEAAAR) practices", *Corporate Social Responsibility and Environmental Management*, Vol. 9 No. 1, pp. 8-25.
- Bell, J. (2016), "The state of the UAE's health: 2016", available at: <http://gulfnews.com/> (accessed 6 November 2017).
- Berman, S., Wicks, A., Kotha, S. and Jones, T. (1999), "Does stakeholder orientation matter? The relationship between stakeholder management models and firm financial performance", *Academy of Management Journal*, Vol. 42 No. 5, pp. 488-506.
- Black, L. and Hartel, C. (2003), "The five capabilities of socially responsible companies", *Journal of Public Affairs*, Vol. 4 No. 2, pp. 125-144.
- Capital Business (2019), "The UAE's healthcare sector: an emerging hotspot for investors", available at: www.capitalbusiness.me/main/details/spotlight/762
- Carter, C. and Jennings, M. (2002), "Logistics social responsibility: an integrative framework", *Journal of Business Logistics*, Vol. 23 No. 1, pp. 145-180.
- Carter, C. and Rogers, D. (2008), "A framework of sustainable supply chain management: moving toward new theory", *International Journal of Physical Distribution and Logistics Management*, Vol. 38 No. 5, pp. 360-387.
- Cheng, E. and Li, H. (2001), "Analytic hierarchy process: an approach to determine measures for business performance", *Measuring Business Excellence*, Vol. 5 No. 3, pp. 30-37.
- Cherian, S., Kasiviswanadh, G., Chaudhary, P.K. and Mishra, A. (2010), "Supply chain dynamics in healthcare services", *International Journal of Health Care Quality Assurance*, Vol. 23 No. 7, pp. 631-642.
- Colantonio, A. (2009), *Social Sustainability: A Review and Critique of Traditional versus Emerging Themes and Assessment Methods*, Oxford Brookes University, Oxford.
- Dahlsrud, A. (2008), "How corporate social responsibility is defined: an analysis of 37 definitions", *Corporate Social Responsibility and Environmental Management*, Vol. 15 No. 1, pp. 1-13.
- de Vries, J. and Huijsman, R. (2011), "Supply chain management in health services: an overview", *Supply Chain Management: An International Journal*, Vol. 16 No. 3, pp. 159-165.
- Dempsey, N., Bramley, G., Powers, S. and Brown, C. (2011), "The social dimension of sustainable development: defining urban social sustainability", *Sustainable Development*, Vol. 19 No. 5, pp. 289-300.
- Djukic, A. and Marić, J. (2017), "Towards socially sustainable healthcare facilities – the role of evidence-based design in regeneration of existing hospitals in Serbia", *Procedia Environmental Sciences*, Vol. 38, pp. 256-263.
- D'Mello, S. (2017), "UAE healthcare sector to grow to Dh103b by 2021", available at: www.khaleejtimes.com/always-in-the-pink-of-health (accessed 7 January 2018).
- Doloi, H. (2012), "Assessing stakeholders' influence on social performance of infrastructure projects", *Facilities*, Vol. 30 Nos 11/12, pp. 531-550.
- Donaldson, T. and Preston, L.E. (1995), "The stakeholder theory of corporation: concepts, evidence, and implication", *Academy of Management Review*, Vol. 20 No. 1, p. 65.
- Dunphy, J.L. (2014), "Healthcare professionals' perspectives on environmental sustainability", *Nursing Ethics*, Vol. 21 No. 4, pp. 414-425.
- Ehrgott, M., Reimann, F., Kaufmann, L. and Carter, C. (2011), "Social sustainability in selecting emerging economy suppliers", *Journal of Business Ethics*, Vol. 98 No. 1, pp. 99-119.
- Esmailzadeh, P., Sambasivan, M., Nezakati, H. and Kumar, N. (2013), "How social exchange in hospitals can influence adoption of clinical IT?", *Journal of Business Administration and Education*, Vol. 2 No. 2, pp. 35-64.
- Field, J.M., Victorino, L., Buell, R.W., Dixon, M.J., Goldstein, S.M., Menor, L.J., Pullman, M.E., Roth, A.V., Secchi, E. and Zhang, J.J. (2018), "Service operations: what's next?", *Journal of Service Management*, Vol. 29 No. 1, pp. 55-97.

- Font, X., Guix, M. and Bonilla, J.M. (2016), "Corporate social responsibility in cruising: using materiality analysis to create shared value", *Tourism Management*, Vol. 53, pp. 175-186.
- Freeman, R. (1984), *Strategic Management: A Stakeholder Approach*, Pitman Publishing, Boston.
- Friedman, A.L. and Miles, S. (2006), *Stakeholders: Theory and Practice*, Oxford University Press, Oxford.
- Frooman, J. (1999), "Stakeholder influence strategies", *Academy of Management Review*, Vol. 24 No. 2, pp. 191-205.
- Gold, S., Hahn, R. and Seuring, S. (2013), "Sustainable supply chain management in 'base of the pyramid' food projects – a path to triple bottom line approaches for multinationals?", *International Business Review*, Vol. 22 No. 5, pp. 784-799.
- Grembowski, D.E., Cook, K.S., Patrick, D.L. and Roussel, A.E. (2002), "Managed care and the US health care system: a social exchange perspective", *Social Science and Medicine*, Vol. 54 No. 8, pp. 1167-1180.
- Holliday, C.O., Schmidheiny, S. and Watts, P. (Eds) (2002), *Walking the Talk: The Business Case for Sustainable Development*, Greenleaf Publishing, Sheffield.
- Huibin, Y.L. (2014), "Inter-organizational service delivery in chinese hospital industry: a social exchange perspective", *Canadian Social Science*, Vol. 10 No. 6, pp. 62-71.
- Huq, F.A., Stevenson, M. and Zorzini, M. (2014), "Social sustainability in developing country suppliers: an exploratory study in the ready made garments industry of Bangladesh", *International Journal of Operations and Production Management*, Vol. 34 No. 5, pp. 610-638.
- Hussain, M. and Malik, M. (2016), "Prioritizing lean management practices in public and private hospitals", *Journal of Health Organization and Management*, Vol. 30 No. 3, pp. 457-474.
- Hussain, M., Khan, M. and Al-Amor, R. (2016a), "A framework for supply chain sustainability in service industry with confirmatory factor analysis", *Renewable and Sustainable Energy Reviews*, Vol. 55, pp. 1301-1312.
- Hussain, M., Malik, M. and Alneyadi, H.S. (2016b), "AHP framework to assist lean deployment in Abu Dhabi public healthcare delivery system", *Business Process Management Journal*, Vol. 22 No. 3, pp. 546-565.
- Hussain, M., Ajmal, M.M., Gunasekaran, A. and Khan, M. (2018), "Exploration of social sustainability in healthcare supply chain", *Journal of Cleaner Production*, Vol. 203, pp. 977-989.
- Hutchins, M. and Sutherland, J. (2008), "An exploration of measures of social sustainability and their application to supply chain decision", *Journal of Cleaner Production*, Vol. 16 No. 15, pp. 1688-1698.
- Jana, A. and Harata, N. (2016), "Provisioning health care infrastructure in communities: empirical evidences from West Bengal, India", *Socio-Economic Planning Sciences*, Vol. 54, pp. 37-46.
- Jiang, B. (2009), "Implementing supplier codes of conduct in global supply chains: process explanations from theoretic and empirical perspectives", *Journal of Business Ethics*, Vol. 85 No. 1, pp. 77-92.
- Khan, M., Hussain, M., Ajmal, M.M. and Helo, P.T. (2018b), "Barriers to social sustainability in the healthcare industry in the UAE", *International Journal of Organizational Analysis*, (Accepted), Vol. 26.
- Khan, M., Hussain, M., Papastathopoulos, A. and Manikas, L. (2018c), "Trust, information sharing and uncertainty: an empirical investigation into their impact on sustainability in service supply chains in the United Arab Emirates", *Sustainable Development*, available at: <https://doi.org/10.1002/sd.1856>
- Khan, M., Hussain, M., Gunasekaren, A., Ajmal, M.M. and Helo, P.T. (2018a), "Motivators of social sustainability in healthcare supply chains in the UAE – stakeholder perspective", *Sustainable Production and Consumption*, Vol. 14, available at: <https://doi.org/10.1016/j.spc.2018.01.006>
- Kleindorfer, P.R., K., Singhal, L.N. and Van, W. (2005), "Sustainable operations management", *Production and Operations Management*, Vol. 14 No. 4, pp. 482-492.

- Konovsky, M.A. and Pugh, S.D. (1994), "Citizenship behavior and social exchange", *Academy of Management Journal*, Vol. 37 No. 3, pp. 656-669.
- Labuschagne, C., Brent, A.C. and Van Erck, R.P. (2005), "Assessing the sustainability performances of industries", *Journal of Cleaner Production*, Vol. 13 No. 4, pp. 373-385.
- Linton, J.D., Klassen, R. and Jayaraman, V. (2007), "Sustainable supply chains: an introduction", *Journal of Operations Management*, Vol. 25 No. 6, pp. 1075-1082.
- Liu, A.M.M., Fellows, R. and Tuuli, M.M. (2011), "The role of corporate citizenship values in promoting corporate social performance: towards a conceptual model and a research agenda", *Construction Management and Economics*, Vol. 29 No. 2, pp. 173-183.
- Lu, R.X., Lee, P.K. and Cheng, T.C.E. (2012), "Socially responsible supplier development: construct development and measurement validation", *International Journal of Production Economics*, Vol. 140 No. 1, pp. 160-167.
- Malik, M., Abudullah, S. and Hussain, M. (2016), "Assessing supplier environmental performance: applying analytical hierarchical process in the United Arab Emirates healthcare chain", *Renewable and Sustainable Energy Reviews*, Vol. 55, pp. 1313-1321.
- Maloni, M. and Brown, M. (2006), "Corporate social responsibility in the supply chain: an application in the food industry", *Journal of Business Ethics*, Vol. 68 No. 1, pp. 35-52.
- Mani, V., Agrawal, R. and Sharma, V. (2016a), "Impediments to social sustainability adoption in the supply chain: an ISM and MICMAC analysis in Indian manufacturing industries", *Global Journal of Flexible Systems Management*, Vol. 17 No. 2, pp. 135-156.
- Mani, V., Gunasekaran, A. and Delgado, C. (2018), "Enhancing supply chain performance through supplier social sustainability: an emerging economy perspective", *International Journal of Production Economics*, Vol. 195, pp. 259-272.
- Mani, V., Gunasekaran, A., Papadopoulos, T., Hazen, B. and Dubey, R. (2016b), "Supply chain social sustainability for developing nations: evidence from India", *Resources, Conservation and Recycling*, Vol. 111, pp. 42-52.
- Mani, V., Agarwal, R., Gunasekaran, A., Papadopoulos, T., Dubey, R. and Childe, S.J. (2016c), "Social sustainability in the supply chain: construct development and measurement validation", *Ecological Indicators*, Vol. 171, pp. 270-279.
- Marshall, D., McCarthy, L., McGrath, P. and Claudy, M. (2015), "Going above and beyond: how sustainability culture and entrepreneurial orientation drive social sustainability supply chain practice adoption", *Supply Chain Management: An International Journal*, Vol. 20 No. 4, pp. 434-454.
- Meixell, M.J. and Luoma, P. (2015), "Stakeholder pressure in sustainable supply chain management", *International Journal of Physical Distribution and Logistics Management*, Vol. 45 Nos 1/2, pp. 69-78.
- Miao, Z., Cai, S. and Xu, D. (2012), "Exploring the antecedents of logistics social responsibility: a focus on chinese firms", *International Journal of Production Economics*, Vol. 140 No. 1, pp. 18-27.
- Mohsen, V., Claudine, S., Behnam, F. and Joseph, S. (2014), "Framing sustainability performance of supply chains with multidimensional indicators", *Supply Chain Management, Bradford*, Vol. 19 No. 3, pp. 242-257.
- Montalbán-Domingo, L., García-Segura, T., Sanz, A.M. and Pellicer, E. (2018), "Social sustainability criteria in public-work procurement: an international perspective", *Journal of Cleaner Production*, Vol. 198, pp. 1355-1371.
- Moretto, A., Grassi, L., Caniato, F., Giorgino, M. and Ronchi, S. (2018), "Supply chain finance: from traditional to supply chain credit rating", *Journal of Purchasing and Supply Management*, available at: <https://doi.org/10.1016/j.pursup.2018.06.004>
- Pagell, M., Wu, Z. and Wasserman, M.E. (2010), "Thinking differently about purchasing portfolios: an assessment of sustainable sourcing", *Journal of Supply Chain Management*, Vol. 46 No. 1, pp. 57-73.

- Park-Poaps, H. and Rees, K. (2010), "Stakeholder forces of socially responsible supply chain management orientation", *Journal of Business Ethics*, Vol. 92 No. 2, pp. 305-322.
- Pfeffer, J. (2010), "Building sustainable organizations: the human factor", *Academy of Management Perspectives*, Vol. 24 No. 1, pp. 34-45.
- Piening, E.P., Baluch, A.M. and Salge, T.O. (2013), "The relationship between employees' perceptions of human resource systems and organizational performance: examining mediating mechanisms and temporal dynamics", *Journal of Applied Psychology*, Vol. 98 No. 6, pp. 926-947.
- Porter, M.E. and Kramer, M.R. (2006), "Strategy and society: the link between competitive advantage and corporate social responsibility", *Harvard Business Review*, Vol. 84 No. 12, pp. 78-92.
- Pullman, M.E. and Dillard, J. (2010), "Values based supply chain management and emergent organizational structures", *International Journal of Operations and Production Management*, Vol. 30 No. 7, pp. 744-771.
- Pullman, M. and Waddock, R. (2017), "Institutional sustainable purchasing priorities: stakeholder perceptions vs environmental reality", *International Journal of Operations and Production Management*, Vol. 37, pp. 162-181.
- Saaty, T. (1980), *The Analytic Hierarchy Process*, 21, McGraw-Hill, New York, NY.
- Saaty, T.L. (2008), "Decision making with the analytic hierarchy process", *International Journal of Services Sciences*, Vol. 1 No. 1, pp. 83-98.
- Santilli, J. and Vogenberg, F.R. (2015), "Key strategic trends that impact healthcare decision-making and stakeholder roles in the new marketplace", *American Health and Drug Benefits*, Vol. 8 No. 1, pp. 15-20.
- Sarkis, J., Torre, P.G. and Diaz, B.A. (2010), "Stakeholder pressure and the adoption of environmental practices: the mediating effect of training", *Journal of Operation Management*, Vol. 28 No. 2, pp. 163-176.
- Seuring, S. and Muller, M. (2008), "From a literature review to a conceptual framework for sustainable supply chain management", *Journal of Cleaner Production*, Vol. 16 No. 15, pp. 1699-1710.
- Shrivastava, P. (1995), "The role of corporations in achieving ecological sustainability", *Academy of Management Review*, Vol. 20 No. 4, pp. 936-960.
- Silvis, J. (2012), "Connecting sustainability to the healthcare mission", available at: www.healthcaredesignmagazine.com (accessed 10 August 2017).
- Singh, M., Rice, J. and Riquier, D. (Eds) (2006), *Transforming the Global Health Care Supply Chain*, MIT Center for Transportation and Logistics, Cambridge, MA.
- Starik, M. and Rands, G.P. (1995), "Weaving an integrated web: multilevel and multisystem perspectives of ecologically sustainable organizations", *Academy of Management Review*, Vol. 20 No. 4, pp. 908-935.
- Tate, W., Ellram, L. and Kirchoff, J. (2010), "Corporate social responsibility reports: a thematic analysis related to supply chain management", *Journal of Supply Chain Management*, Vol. 46 No. 1, pp. 19-44.
- Thin, N. (2002), *Social Progress and Sustainable Development*, ITDG Publishing, London.
- US-UAE Business Council (2016), *The U.A.E. healthcare Sector: An Update*, US-UAE business council, Washington, DC.
- Vifell, A.C. and Soneryd, L. (2012), "Organizing matters: how the social dimension gets lost in sustainability projects", *Sustainable Development*, Vol. 20 No. 1, pp. 18-27.
- Vision2021 (2010), "UAE's vision 2021", Available at: www.vision2021.ae/en (accessed 23 April 2017).
- Visser, W. and Sunter, C. (Eds). (2002), *Beyond Reasonable Greed: Why Sustainable Business Is a Much Better Idea*, Human and Rousseau Tafelberg, Cape Town.
- Yawar, S.A. and Seuring, S. (2017), "Management of social issues in supply chains: a literature review exploring social issues, actions and performance outcomes", *Journal of Business Ethics*, Vol. 141 No. 3, pp. 621-643.

- Walker, H. and Jones, N. (2012), "Sustainable supply chain management across the UK private sector", *Supply Chain Management: An International Journal*, Vol. 17 No. 1, pp. 15-28.
- Wartick, S.L. and Wood, D.J. (1998), *International Business and Society*, 6th edition, Blackwell, Malden (MA).
- Wu, Z. and Pagell, M. (2011), "Balancing priorities: decision-making in sustainable supply chain management", *Journal of Operations Management*, Vol. 29 No. 6, pp. 577-590. VolNo

Further reading

- Carter, C. and Easton, P. (2011), "Sustainable supply chain management: evolution and future directions", *International Journal of Physical Distribution and Logistics Management*, Vol. 41 No. 1, pp. 46-62.
- Gualandris, J., Klassen, R.D., Vachon, S. and Kalchshmidt, M. (2015), "Sustainable evaluation and verification in supply chains: aligning and leveraging accountability to stakeholders", *Journal of Operations Management*, Vol. 38 No. 1, pp. 1-13.
- Simpson, D. and Sroufe, R. (2014), "Stakeholders, reward expectations and firms' use of the ISO 14001 management standard", *International Journal of Operations and Production Management*, Vol. 34, pp. 830-852.

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