

CHAPTER 3: HOSPITALS' SUPPLY CHAINS IN AUSTRALIA AND TURKEY AND
INTERNATIONAL STANDARDS

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3.1. Introduction

The purpose of this chapter is to present the results of the literature review on supply chains in hospitals in such countries as Australia and Turkey. The application of supply chain management is viewed as a complex task with reference to the realities of the healthcare industry in these countries. Therefore, much attention has been paid to searching for literature and retrieving information on specifics of implementing the principles of supply chains, including green ones, in healthcare organisations of these countries. Moreover, the literature on international standards that regulate the sustainable development in organisations has also been reviewed in order to collect background data on how healthcare authorities follow and integrate ISO 14001 and ISO 9001 in their facilities in Australia and Turkey.

3.2. Hospitals' Supply Chains in Australia

In this section of the chapter, it is important to review specific features of hospital supply chains in Australia that depend on the national legal environment, as well as on particular features of the market and industry. Therefore, it is necessary to pay attention to specifics of supply chains in Australian hospitals and to the principles of their work. Moreover, this section also presents the analysis of researchers' ideas regarding the importance of supply chains in the country and regarding the unique features of green supply chains in the context of Australian hospitals.

3.2.1. Specifics of Supply Chains in Australian Hospitals

In hospital supply chains, much attention is paid to such components as supply, labour, and purchasing activities that directly influence the quality of provided care and expenses. In Australia, these components of a supply chain also play key roles because hospitals spend many

financial resources on ensuring the provision of high-quality supply, improving care, and guaranteeing the attraction of the most qualified staff (Böhme *et al.*, 2014). As it is noted by Bhakoo, Singh, and Sohal (2012, p. 218), “the Australian hospital supply chain has a three-tiered structure including the manufacturer, wholesaler/distributor and a hospital.” The role of wholesalers or distributors in this context is important because products do not come directly from suppliers to hospitals, and this specific feature influences the work of a chain.

One more characteristic of a hospital supply chain in Australia is its dependence on the aspects of total quality management. There are many international, national, and regional standards and guidelines that determine the quality of provided services in hospitals, thus affecting the work of a supply chain (The Royal Australian College of General Practitioners, 2015). Furthermore, the variety of these standards is high because specific norms and rules are followed in different regions of Australia, and the healthcare industry of the country is not interconnected, and cooperation within supply chains in different regions is based on various guidelines.

It is also important to note that a hospital supply chain based on three key actors can be expanded to include government agencies and insurance companies. The necessity of collaborating with these actors also influences the development of supply chains in Australia through affecting direct and indirect paths of spreading resources (Bhakoo, Singh and Sohal, 2012; Böhme *et al.*, 2014). As it was noted earlier, the indirect path involving wholesalers and distributors is more typical of the Australian hospital supply chain (Rakovska and Stratieva, 2018). In spite of the fact that hospitals in many countries often choose the direct cooperation, researchers noted that the intermediation involving wholesalers and distributors can have positive economic outcomes for hospitals (Bhakoo, Singh and Sohal, 2012; Rakovska and

Stratieva, 2018). From this perspective, it is possible to state that the level of interrelatedness between actors of hospital supply chains in Australia is high, but the overall level of similarity between public and private hospital chains or between supply chains in different regions of the country is comparably low.

3.2.2. Supply Chains in Hospitals in Australia

In this sub-section, it is important to focus on the literature that explains how a three-tiered structure of Australian hospital supply chains works in detail. According to Bhakoo, Singh, and Sohal (2012), it is critical for hospital supply chains to develop the distribution function in order to spread resources more efficiently on other operations, processes, and activities. As a result, the pressure on the staff also decreases. In addition, according to Agarwal *et al.* (2016), specific roles of participants in hospital supply chains can be shifted when it comes to persons responsible for making purchasing decisions, spreading resources, planning costs, contacting with manufacturers and distributors, and buying products and services. Thus, researchers note that supply chains in Australian hospitals develop in order to optimise the work of all actors and achieve the highest results.

Furthermore, hospital supply chains in Australia can be discussed as rather flexible, and they can adapt to changes in government regulations and markets. This idea was proposed and discussed by Bhakoo, Singh, and Sohal (2012) and Budgett, Gopalakrishnan, and Schneller (2017) in their studies. However, in spite of flexibility in the work of supply chains and effectively organised interactions with distributors, hospitals can face some issues that are reported in the literature. For example, collaboration can be affected by the lack of trust between hospitals and distributors or between hospitals and manufacturers. Moreover, there are often situations when goal incongruence is observed between hospitals, distributors, and manufacturers

(Böhme *et al.*, 2014). This problem appears when distributors or manufacturers try to maximise their profits or when hospitals are oriented towards decreasing their costs significantly.

Supply chains in Australia should also be viewed as not only flexible but also dynamic, and this aspect influences the choice of supply chain management practices to adopt in this or that situation. In order to apply these practices effectively, managers in hospitals need to address a series of purchasing decisions, focus on specifics of cooperation, and select appropriate distributors. In addition, researchers also identified such risks for developing working supply chains as decentralisation, the lack of appropriate information sharing, and the lack of effectively used information technologies (Böhme *et al.*, 2014; Budgett, Gopalakrishnan and Schneller, 2017). These issues are also typical of Australian hospital supply chains, and they need to be addressed by managers.

3.2.3. Importance of Supply Chains in Australian Hospitals

In Australian hospitals, supply chains play the significant role in ensuring the provision of on-time and high-quality care for patients. To support this idea, researchers indicate that effectively arranged supply chains involving hospitals work to cope with such types of waste in activities and operations of healthcare facilities as reworking, overproduction, ineffective processing, increased waiting time, weaknesses in transportation, and inappropriate management of inventory (Machado, Scavarda and Vaccaro, 2014; Rodwell and Gulyas, 2013). It is important to note that these common types of waste are identified for different forms of supply chains, including hospital ones among others.

The importance of supply chains and interactions between partners within these systems is accentuated in many research articles on the topic. Different studies provide evidence to support the idea that collaboration within supply chains is necessary for eliminating waste,

avoiding procurement hazards, using resources appropriately, improving logistics, and decreasing a negative impact on the environment and community (Bhakoo, Singh and Sohal, 2012; Machado, Scavarda and Vaccaro, 2014; Rodwell and Gulyas, 2013). As a result, performance, productivity, and competitive advantage of private and public healthcare organisations improve due to efficient and properly coordinated collaboration. In order to operate effectively, hospitals in Australia need to plan their activities and interactions with suppliers and distributors with much attention on information sharing, spending financial resources, and protecting the environment (Chakraborty and Dobrzykowski, 2014). When a supply chain including this or that hospital does not work efficiently, the balance in the system is affected, and there appear threats to the life and health of patients.

Therefore, researchers agree on the fact that supply chains in the healthcare industry are important for improving the quality of care, implementing innovation, as well as reducing costs, waiting time, and used resources. According to De Vries and Huijsman (2011), the integration of flows of resources and information associated with collaboration is important for organisations to enhance processes in their specific internal and external environments that involve different actors. In spite of the fact that the coordination of the work of all partners in a system, the elimination of waste, and the appropriate distribution of resources are viewed as the key ideas and principles associated with supply chain management, researchers also put emphasis on the strategic nature of effectively arranged supply chains (Min, 2014; Polater, Bektas and Demirdogen, 2014). The reason is that the strategic goals of any organisation can be successfully addressed only in those cases when all partners in a chain work in cooperation.

The other group of researchers accentuated the importance of supply chains in the healthcare industry with the focus on perspectives for predicting or coping with possible threats

and barriers in the market. Thus, if supply chain management relationships are not efficient or not based on trust between all actors, there are risks that operations and activities in hospitals can be negatively affected involving more outside actors to resolve a problematic situation (Böhme *et al.*, 2014; Rakovska and Stratieva, 2018). In addition to that, referring to building strong supply chains, leaders in hospitals not only improve the inventory management and logistics in their organisations, but they mainly focus on creating prolonged positive relationships with suppliers and distributors in order to rely on these partners in any situation (Bhakoo, Singh and Sohal, 2012; Budgett, Gopalakrishnan and Schneller, 2017). From this perspective, developing supply chains, leaders in Australian hospitals and globally focus on minimising risks associated with the fact that hospital supply chains are based on the issue of availability of resources, interconnectedness, and collaboration.

It is also possible to find several stages of maturity identified for supply chains in the literature that can be discussed in the context of supply chains in Australian hospitals. At the first stage, new hospitals only start developing their supply chains by finding partners in order to address the needs in terms of materials, resources, and different types of supplies. At the next stage, hospitals build their supply chains according to the principle of collaboration in order to improve the delivery of care and patient outcomes. At the most advanced stage, managers in the healthcare industry become interested in building sustainable and integrated supply chains in order to guarantee the progress of an organisation with the focus on economic, social, and environmental dimensions (Bhakoo, Singh and Sohal, 2012; Correia *et al.*, 2017; Rodwell and Gulyas, 2013). These stages are described in the recent literature on the problem, and they illustrate the idea that the development of effective supply chains is an important step for Australian hospitals to improve their performance.

3.2.4. *Green Supply Chain Management in Australian Hospitals*

In spite of the fact that green supply chain management is actively discussed today in scholarly literature in relation to the idea of sustainability, there are no recent reports or studies on applying the principles of green supply chains in the Australian healthcare sector. In their study, Bhakoo, Singh, and Sohal (2012) focused on examining the nature of interactions between actors of hospital supply chains in Australia, but they did not refer to the case of greening supply chains. Furthermore, Mitchell *et al.* (2017) concentrated their cross-sectional study on analysing effective cleaning practices in Australian hospitals in the context of minimising waste, increasing productivity, and improving patient outcomes, and some of the proposed approaches can be viewed in the context of greening, but they did not discuss the role of supply chains. Thus, it is possible to state that the information on sustainable or green supply chains in the healthcare industry of Australia is rather limited.

The review of the literature has indicated that available reports also do not provide appropriate statistics or facts regarding the issue. In the report by Global Access Partners (2016), the researchers analysed the most effective approaches to arranging supply chains in the Australian healthcare industry, but they did not mention possible variants of greening those chains that are used currently. Therefore, it is almost impossible to retrieve the relevant information on green supply chains in Australian hospitals from available sources and research articles.

However, there are still some studies that can be viewed as helpful for understanding the trends in the Australian healthcare regarding the implementation of sustainable and green supply chains. As a result of their multi-method research, Böhme *et al.* (2014) found that supply chains in Australian hospitals are often inefficient because working systems are inappropriate, and

functions and roles of all participants are not stated or followed clearly. The researchers proposed a series of improvements for current supply chains in the Australian healthcare industry, and they concentrated on enhancing flows of resources and people within a chain. Some implications for developing a sustainable network with the elements of greening were also proposed (Böhme *et al.*, 2014; Silvestre, 2016; Zainudin *et al.*, 2014). These steps are critical in order to make hospital supply chains in Australia as efficient as it is in other countries of the world, according to the data reported by Toke, Gupta, and Dandekar (2010) and Mbaabu (2016).

There are also other authors who proposed some ideas on the issue of creating sustainable or green supply chains in the country. According to Budgett, Gopalakrishnan, and Schneller (2017), hospitals in Australia are on the path of developing sustainable and green supply chains with the focus on the idea of building integrated supply chains to guarantee the strategic collaboration of all partners within a network. In this context, leaders in the healthcare industry contribute to using IT for sharing information and making strategic decisions. In addition, the focus on modernised supply chains is associated with “aggregating purchasing data enabled procurement to better understand trends and possible areas for cost-reduction projects in a public hospital in Australia” (Budgett, Gopalakrishnan and Schneller, 2017, p. 64). It is important to note that all these steps to improving supply chains lead to developing strong working systems that are rather sustainable and corresponding with strategic goals of an organisation that also include the environmental stability. Thus, green supply chains are implemented in Australian hospitals, but more research is required in this field in order to cover this gap in the existing literature on the topic.

3.3. Hospitals' Supply Chains in Turkey

Supply chains in hospitals of Turkey also have particular features in comparison to those chains adopted in healthcare industries of other countries. In Turkey, supply chains typical of hospitals are discussed as rather fragmented, and this aspect influences operations of all involved actors, as well as their communication (Polater, Bektas and Demirdogen, 2014). Therefore, it is important to focus attention on the literature that describes the elements of supply chain management in Turkey.

3.3.1. Specifics of Supply Chains in Turkish Hospitals

As it is presented in the literature, supply chains that are adopted in Turkish hospitals are characterised by the great number of involved actors. According to Polater, Bektas, and Demirdogen (2014, p. 115), the major participants in these chains include “manufacturers (drugs, medical equipment, and hospital medical supplies), distributors, medical service providers, medical groups, insurance companies, government agencies (such as, Social Security Services), employers, government regulators, and users of healthcare services.” As a result, the level of fragmentation in this network is high, and this factor influences the quality of interactions and expenses associated with maintaining the whole chain.

It is also discussed in the literature on supply chains in Turkey that this field is highly regulated by national directives and norms oriented to protecting the environment. As a consequence, following different types of directives, organisations in Turkey pay much attention to reducing waste in their operations. According to the results of Camgöz-Akdağ *et al.*'s (2016, p. 469) study, Turkish organisations in the healthcare industry are oriented to preventing waste “at source, otherwise reduce waste and finally if waste is unavoidable recycle it.” From this perspective, the variety of relationships between participants in supply chains is based on the

idea that the limited amount of waste can be produced at each stage of interactions within a chain (Erus and Hatipoglu, 2013). Researchers agree that authorities in Turkish hospitals pay much attention to following directives and norms as well as to eliminating waste in operations.

Supply chains in Turkey are also characterised by the emphasis on the role of leaders or managers in the process of regulating and monitoring interactions within a developed network, as it is in the case of hospital supply chains. According to Akdağ (2015), the authorities in the Turkish healthcare industry concentrated on bringing change to administration and operations in hospitals in order to improve the quality of care and address clients' needs. In this context, they shifted to the idea of transformational leadership and the adoption of the most efficient practices to enhance all types of interactions between healthcare providers, suppliers, and clients. From this perspective, leaders in supply chains of Turkish hospitals are oriented to implementing change in business processes and moving to the principles of sustainable supply chain management with the focus on greening techniques.

3.3.2. Supply Chains in Hospitals in Turkey

In Turkey, supply chains in hospitals work to ensure that patients receive care and treatment in time with reference to all required medications, equipment, and services. In this context, all actors of a chain discussed by researchers are expected to provide “a synchronised decision” in order to achieve the highest result (Polater, Bektas and Demirdogen, 2014, p. 116). Thus, the whole process of the cooperation in a chain is based on all participants in order “to produce and distribute the products or services at the right quantities, to the right locations, and at the right time, in order to minimise system-wide costs while meeting customer expectations” (Polater, Bektas and Demirdogen, 2014, p. 116). According to these researchers, if these tasks are addressed efficiently, it is possible to expect significant achievements in patient outcomes.

As it was stated earlier, hospital supply chains in Turkey are considered to be fragmented because operations associated with different stages of these chains are usually completed independently, and the whole chain does not work as a system. The support for this idea is provided in research-based articles by Erus and Hatipoglu (2013), Polater, Bektas, and Demirdogen (2014), and Turkyilmaz, Bulak, and Zaim (2015). As a result, different types of leaders in healthcare facilities in Turkey are oriented to developing the most effective supply chains, the components of which can work interdependently, as it is in the case of popular integrated supply chains (Özkan, Akyürek and Toygar, 2016). It is also important to state that the development of the greening concept is also a task for managers because sustainability is viewed as the requirement in the healthcare industry of Turkey.

3.3.3. Importance of Supply Chains in Turkish Hospitals

In spite of the fact that the limited number of studies exists on specifics of supply chains in the Turkish healthcare industry, the importance of choosing the most innovative variants of networks and types of cooperation with suppliers, distributors, and clients is accentuated in current articles. The reason is that researchers note that the focus on supply chain management is the priority for the majority of modern healthcare organisations (Polater, Bektas and Demirdogen, 2014; Turkyilmaz, Bulak and Zaim, 2015). The application of supply chains in Turkish hospitals is discussed in the literature because the adoption of sustainable systems will potentially lead to improving the quality of the provided care and the quality of life in communities because of decreasing a negative effect on the environment.

Currently, expenses associated with supporting operations in the healthcare industry in Turkey are high. According to Camgöz-Akdağ *et al.* (2016), in order to reduce these costs, it is necessary to change the approach to supply chain management in both public and private

hospitals. The refocus on green supply chains is efficient in this case because the use of green materials and goods and the choice of recycling guarantee the reduction of waste and negative effects on the environment (Bracci and Tallaki, 2015; Chakraborty, Bhattacharya and Dobrzykowski, 2014). In addition, such sustainable choices can potentially lead to saving all types of resources for an organisation, involving not only material but also financial ones.

Referring to the available literature on supply chains in Turkey, it is possible to note that the healthcare industry in the country is on the path to altering its operations in order to make them greener according to the standards that have been adopted at the national and local levels, as well as according to European and global trends. In this context, much attention is paid to imitating patterns that are used by US hospitals because of their orientation to environmentally friendly supply chains, and this practice is followed in the United States during about two decades (Chiarini, 2015; Dobrzykowski *et al.*, 2014; Gerwig, 2015). The experience of the United States and European countries is widely discussed in the literature as important in order to accentuate the role of moving to green supply chains for saving all types of resources and improving performance and productivity.

3.3.4. Green Supply Chain Management in Turkish Hospitals

As it is discussed in the limited literature on supply chain management in the healthcare industry of Turkey, green supply chains are widely adopted by leaders in their hospitals in order to improve the quality of proposed care. Those healthcare facilities where sustainable or green supply chains are adopted are characterised by using ecologically appropriate building materials, the efficient management of hazardous materials, utilising products that do not include mercury or bis(2-ethylhexyl) phthalate, using green cleaners and electronics (Calipinar and Soysal, 2012; Özkan, Akyürek and Toygar, 2016). In addition, those hospitals that apply green supply chains

are focused on effective reduction and management of waste, as well as on recycling. These practices are important to contribute to sustainability of all operations in this or that healthcare organisation.

It is important to discuss what particular features of green supply chains are viewed as attractive by managers in Turkish hospitals with reference to the fact that they are inclined to follow western patterns adopted in the United States and European countries. According to Özkan, Akyürek, and Toygar (2016), green supply chain management in hospitals is based on guaranteeing the protection and efficient use of resources in order to eliminate waste. Much attention is also paid to recycling. There are practices when the unnecessary equipment is recycled along with other daily goods typically utilised in hospitals. Another strategy includes the use of only reusable and recyclable products, as well as cleaners and substances for sterilisation and disinfection that can be applied without affecting the environment. Özkan, Akyürek, and Toygar (2016) state that these practices are now followed in such hospitals in Turkey as Istanbul Florence Nightingale Hospital and Medistate Kavacık Hospital in order to shift the focus of management on sustainability and ensure the protection of the environment while making ecologically appropriate choices and decisions.

Although the authorities in hospitals in Turkey have focused on implementing supply chains, especially green supply chains, into their healthcare systems, there is still the lack of data regarding this process. Some researchers agree that the shift to green supply chains observed in the industry is a stable phenomenon that will lead to positive changes in the sphere in the future (Akdağ 2015; Özkan, Akyürek and Toygar, 2016). Other researchers point at a range of barriers and challenges associated with the process, and they note that overcoming these issues can take years for hospitals in order to understand what type of a supply chain can work best in this or

that context (Camgöz-Akdağ *et al.*, 2016; Erus and Hatipoglu, 2013; Polater, Bektas and Demirdogen, 2014). As a result, more research is required in order to understand what particular tendencies are followed in hospitals in Turkey in terms of developing the effective supply chain management based on creating green supply chains.

3.4. Green Supply Chain Management and International Standards ISO 14001 and ISO 9001

The mass production of goods and the development of the service-oriented industries have led to the necessity of standardising their activities and measuring the quality of operations in order to guarantee addressing clients' needs in most cases. The International Standardisation Association (ISA) was established in 1926, and this organisation became the predecessor of the organisation that is widely known today for its focus on providing guidelines and standards for operations in different types of industries. Thus, the International Organisation for Standardisation (ISO) was founded in 1946 in Brussels (Muzaimi, Chew and Hamid, 2017; Stoimenova, Stoilova and Petrova, 2014; Toprak and Şahin, 2013). It began to develop as an international organisation oriented to the standardisation of manufacturing processes that was non-governmental in its character.

Standardisation covered by the ISO is applied in a variety of industries and firms, and exceptions are only related to such fields as electro-technical engineering and electrics which are regulated by other standards and norms (Chege, 2012; Toprak and Şahin, 2013). From this point, it is important to review the literature on the standards published by the ISO that are directly associated with the implementation of supply chains in different companies. The application of ISO 14001 Environment Management and Occupational Health and Safety Management and ISO 9001 Quality Management Systems – Requirements is discussed in the following sub-

sections with reference to the recent literature on the topic within the context of the healthcare industry.

3.4.1. ISO 14001 and Its Application in Organisations

The problem associated with achieving sustainability in hospitals and developing green supply chains is based on the fact that organisations usually have direct and indirect negative influences on the environment, and they need to be overcome. These direct and indirect negative impacts are related to suppliers' inputs and associated waste at different stages of the cycle that need to be controlled (Chege, 2012). ISO 14001 Environment Management and Occupational Health and Safety Management was developed by the International Organisation for Standardisation in the 1990s for the purpose of improving environmental practices in all industries, without exception.

This standard belonging to the family of ISO 14000 controls the environmentally friendly management with reference to supply chain processes, and the current version of the standard was published in 2015 (International Organisation for Standardisation, 2015). According to the ISO 14001 norms, the impact on the natural environment is “any change in the environment, whether adverse or beneficial, wholly or partially resulting from an organisation's activities, products or services,” as it is noted by Olsthoorn et al. (cited in Laari, 2016, p. 43). This impact should be minimised while applying ISO 14001 to production and services.

The application of ISO 14000 allows an organisation to follow a certain system in addressing the environmental dimension related to sustainability. When following the norms prescribed by ISO 14001, different types of organisations, including healthcare facilities, can address the international norms regarding the ecological character of their activities, improve their environmental performance, and contribute to achieving sustainability in operations

(International Organisation for Standardisation, 2015). It is important to note that there are no determined criteria in order to regulate the environmental performance of organisations that allows for applying this standard in different contexts.

From this perspective, ISO 14001 is typically applied by those organisations and firms that plan to improve their operations in terms of their impact on the environment. The ISO14001 certification allows for reconsidering environmental practices followed in the company in order to achieve better outcomes for the environment (Chege, 2012). What is more important is that accreditation is not a requirement for adopting ISO14001 when companies choose to develop environmental management systems in a holistic manner (International Organisation for Standardisation, 2015). Therefore, while focusing on waste management, eliminating air and soil pollution, and guaranteeing the efficient use of sources, organisations follow ISO14001 principles in the most appropriate manner for them, and they become interested in the continual improvement of their environmentally friendly practices, as it is in the case of creating sustainable supply chains.

3.4.2. ISO 9001 and Its Application in Organisations

The quality management in organisations is an additional issue that affects the creation of an effective working supply chain. The International Organisation for Standardisation published the ISO 9000 family of guidelines in order to contribute to developing the most effective quality management strategies in organisations. In this family of standards, ISO 9001 Quality Management Systems – Requirements is applied in order to establish an appropriate working quality management system according to the international principles of quality assurance in different types of organisations (International Organisation for Standardisation, n.d.). According to Kovac (2014), ISO 9001 is applied when firms are oriented to implementing a quality

management system and proposing specific services and products that can address clients' needs. However, it is also important to note that, in its nature, the ISO 9001 standard was not developed to assess the quality of offered products, and the key focus is on proposing a set of principles according to which it is possible to organise systematised operations that are of high quality.

From this perspective, ISO 9001 can be viewed as rather generalised because of possibilities to apply it in various organisations which operations and activities differ significantly. This idea is supported by Kovac (2014, p. 670) who states that the ISO 9001 certification should be viewed as “a generic standard that defines certain requirements for the quality management system which are applicable to all organisations, regardless of their type and scope, and consequently to healthcare organisations as well.” This standard in the ISO 9000 family requires certification and accreditation, and this aspect contributes to following its norms by firms in the most accurate manner (International Organisation for Standardisation, n.d.). The latest version of this standard is ISO 9001:2015 that is correlated with the recent tendencies in the sphere of measuring the quality management in an organisation (International Organisation for Standardisation, n.d.). Thus, this certification is important to be considered while discussing approaches to developing efficient supply chains as successfully working systems.

In spite of the fact that the application of the ISO 9001 certification in organisations is associated with significant positive changes in business processes with the focus on the increased efficiency, researchers still note that many companies face certain challenges when new quality management systems are implemented. The problem is that changes in quality management are associated with alterations in operations and increased workloads, some of the processes are revised, and more innovations are integrated (Muzaimi, Chew and Hamid, 2017; Stoimenova, Stoilova and Petrova, 2014). Furthermore, the application of these systems according to the ISO

9001 standard also requires the involvement of trained auditors, but there is the lack of these specialists in the sphere (Toprak and Şahin, 2013). Still, even if the applied quality management system that operates according to the principles of the ISO 9001 certification is not perfect, and more improvements are required, managers report increases in levels of satisfaction with provided services, as it is stated by researchers.

3.4.3. ISO 14001 and ISO 9001 in Healthcare

There are many studies on specifics of applying ISO 14001 and ISO 9001 in healthcare organisations of different countries, but the limited research on the situation in Australia and Turkey is present. It is important to focus on how these standards can be used in hospitals over the globe. In the context of adopting the ISO 14001 standard, it is expected that organisations will be able to reduce their waste, contamination of air, water, and soil, eliminate costs, and avoid the use of hazardous materials (International Organisation for Standardisation, 2015). Furthermore, the application of the standard in hospitals is associated with decreasing the possibility of environmental accidents and enhancing performance because of decreased numbers of pollutants in the environment (Chege 2012). Therefore, while applying ISO 14001, organisations become able to determine what environmental impact their operations have and how it can be addressed in terms of controlling activities, using resources, and manipulating inputs and outputs.

Researchers agree that the work of supply chains in organisations should be based on the ISO certification system in terms of regulating the impact on the environment in order to guarantee the effective control over a firm's operations and outputs (Chege, 2012; Liu *et al.*, 2017). Moreover, according to Moradi *et al.* (2016), in hospitals, it is expected that managers adopt different types of ISO standards to address all possible issues associated with the quality of

services and products and sustainability of operations. Chege (2012) stated that, in order to implement the ISO 14001 standard in the most efficient manner, it is necessary to apply it in an organisation in the context of the followed environmental policy. As a result, it is possible to expect that a new effective environmental management system will successfully work in a healthcare facility under such conditions to address patients' needs.

The high quality of delivered care is a priority for healthcare organisations, and governments, authorities, and stakeholders are focused on demanding the provision of superior care while using limited resources, appropriately applying public funding, and demonstrating transparency and accountability in relation to operations in hospitals. In this context, modern hospitals experience the pressure associated with the necessity of guaranteeing quality and realising the principles of accountability (Kovac, 2014). Therefore, authorities recommend healthcare facilities to apply innovative and effective quality management systems according to the ISO 9001 standard. Earlier, ISO standards provided recommendations regarding technical specifications of processes in different types of industries, including the service sector (Stoimenova, Stoilova and Petrova, 2014). Later, ISO standards became applicable to the healthcare industry to ensure that the quality of provided care and services is high and safety of clients is guaranteed.

The application of ISO 9001 in the healthcare industry is a challenging process that is widely researched by experts. The ISO 9001 standard prescribes organisations how to arrange, document, integrate, maintain, and assess a specific quality management system applied in this or that firm. However, it is important to note that requirements listed in ISO 9001 are widely applicable in their nature. Therefore, this standard is adopted in the majority of firms regardless of their sphere or activities, including hospitals (International Organisation for Standardisation,

n.d.). This standard is also reported by Kovac (2014, p. 674) as “the most widely used international standard that sets the requirements for the establishment and maintenance of quality management systems, and is applicable to all types of organisations (profit/non-profit, product/service, small/medium/large).” Thus, if an organisation, and a hospital in particular, starts the process of reforming its supply chain to make it more sustainable and integrated, the application of the 9001 ISO certification is viewed as a reasonable step on this path.

Researchers reported the tendency of implementing quality management systems in hospitals all over the globe because of the necessity to increase the quality of services, address patients’ needs, and prevent medical errors. These tasks should be viewed as critical for healthcare organisations. When quality management systems are adopted in healthcare facilities with reference to ISO 9001, leaders or administrators receive many opportunities to address all possible insufficiencies in processes, improve provided services, regulate controlling and monitoring processes, and prevent or decrease all possible damages while following requirements and guidelines. According to Turkyilmaz, Bulak, and Zaim (2015, p. 1), “to achieve service excellence, hospitals must strive for zero defects and retain every customer that the company can profitably serve.” In order to reach these goals, efficient supply chains based on effective quality management are required.

Researchers support the idea that certification is usually chosen by organisations in the context of their activities oriented to building green supply chains because this approach allows for the continuous improvement of operations, determination of certain stages to follow, and customer satisfaction because of the improved quality of services. According to Toprak and Şahin (2013, p. 111), “a health institution accredited with quality assurance certificate not only gains the trust of the public, but also improves the service performance at individual and

institutional level thanks to increased cooperation among different units of the institution.” As a result, it is possible to expect that all key operations in a hospital associated with the quality of services and environmental protection are regulated and effectively maintained based on these standards, contributing to the development of a green supply chain.

3.4.4. ISO 14001 and ISO 9001 in Australian Hospitals

The focus on ISO standards guarantees not only the improvement of quality associated with products and services but also cost savings for companies. Furthermore, the perceived quality of services also increases if clients and other stakeholders know that an organisation follows ISO standards (Chege, 2012). Managers oriented to implementing ISO 14001 and ISO 9001 in hospitals expect that they will receive significant benefits associated with improving the quality of products and reducing a negative impact on the environment in the context of creating efficient supply chains. This situation is also typical of Australian hospitals where ISO 14001 and ISO 9001 are followed in the majority of public healthcare facilities (The Royal Australian College of General Practitioners, 2015). The reason is that, if a hospital adopts ISO standards, its leaders can expect some benefits, including increases in efficiency, high productivity levels, higher employee satisfaction, improved quality of products and services, reduced costs, and as a result, increased revenues.

In the literature on supply chains in Australia, there are a few mentions of possible applications of ISO 14001 and ISO 9001 in this context. Still, researchers report the importance of following certification in the context of public and private hospitals, as well as other organisations (Australian Government, 2016; The Royal Australian College of General Practitioners, 2015). As it is mentioned by Stoimenova, Stoilova, and Petrova (2014, p. 373) in their article, the ISO 9001 standard, for instance, “is utilised in a variety of ways as a vehicle for

health care organisations to identify systemic breakdowns and close gaps, streamline workflow and maximise resource utilisation,” and moreover, it is used to “focus on patient and provider needs and expectations, facilitate compliance to health care accreditation standards and regulatory requirements, etc.” Therefore, the application of standards oriented to improving environmental and quality management systems in Australian hospitals can be viewed as an appropriate choice for healthcare organisations where the quality of services and protection of a community’s interests, including environmental ones, are the priorities.

To guarantee that a supply chain in an Australian hospital develops as a green one, the application of ISO 14001 is expected in order to determine and follow specific requirements regarding environmentally friendly processes and operations typical of healthcare settings. Researchers also pay attention to the fact that the development of a supply chain is associated with integrating a quality management system, and its work is expected to be regulated by ISO 9001 (Muzaimi, Chew and Hamid, 2017; Toprak and Şahin, 2013). Focusing on building strong and efficient supply chains in hospitals, leaders need to start the accreditation and certification process. In the context of Australia, the reference to ISO 14001 and ISO 9001 is supported at national, state, and local levels (Australian Government, 2016; World Health Organization, 2014). Researchers also note that the provision of the ISO certificate does not mean stopping the development process, and an organisation is expected to be accredited every three years while having the space for progress and expanding sustainable supply networks (Chege, 2012; Kovac 2014). For Australian hospitals, it is important to refer to standards for environmentally friendly operations and improve quality while building supply chains.

3.4.5. ISO 14001 and ISO 9001 in Turkish Hospitals

In Turkish hospitals, the application of ISO 14001 and ISO 9001 is a widely followed modern trend because this approach guarantees positive changes in healthcare operations and processes in order to address clients' needs and expectations (Özkan, Akyürek and Toygar, 2016; Toprak and Şahin, 2013). For instance, according to Toprak and Şahin (2013, p. 114), in Turkey, "while in 2006, the number of the Health of Ministry hospitals with ISO 9000:2000 and the ISO 9001:2000 certification was 68, this number increased to 112 in 2008." Later, positive changes in the tendency were also observed because of identifying obvious benefits in improving quality management systems in correlation with the recommendations provided by ISO 9001.

The similar situation can be noticed with reference to the implementation of the principles of ISO 14001 in Turkish hospitals. This practice is directly associated with the establishment of new principles of creating green supply chains. The development of sustainable networks to regulate operations in hospitals depends on the adoption of certain national policies proposed by the Turkish authorities at different levels (Erus and Hatipoglu, 2013). However, the application of ISO 14001 as the key standard to regulate the work of environmental management systems is essential for this context because concrete actions of suppliers and partners in hospital chains need to be strictly regulated to achieve higher results and decrease negative influences on the environment.

It is also important to pay attention to the fact that, in Turkey, hospitals became interested in applying the quality certification in the 1990s, but the process was rather slow. Today, the focus of healthcare organisations on using certification is more obvious, and the compliance with requirements promoted according to ISO 14001 and ISO 9001 allows healthcare organisations to respond to clients' needs, minimise errors, conduct regular assessments, and monitor all possible strengths and weaknesses in processes (Muzaimi, Chew and Hamid, 2017; Polater, Bektas and

Demirdogen, 2014; Vincente *et al.*, 2015). Thus, as it is noted by Toprak and Şahin (2013, p. 112), “the quality certificate, which is the proof of improved performance contributes to the second-party audits and customers’ higher perception of quality.” The level of trust to the hospital that has successfully applied ISO 14001 and ISO 9001 can increase while leading to positive changes in financial gains.

From this perspective, the literature indicates that Turkish hospitals receive many benefits while referring to the ISO standards. As it is noted by Stoimenova, Stoilova, and Petrova (2014) and Muzaimi, Chew, and Hamid (2017), leaders in healthcare organisations become able to plan operations with reference to internal and external environments and ensure controlling all processes associated with caring for patients. They also receive tools in order to decrease the number of medical errors and patient complaints and guarantee the most efficient use of available resources with reference to the principles of reverse logistics among others (De Vries and Huijsman 2011; Stoimenova, Stoilova and Petrova, 2014). As a result of applying the ISO standards, hospitals seem to change all processes that were typical of them previously in the context of ensuring high quality of services and sustainability.

Researchers note as a result of their studies and reviews of available literature that immediate positive outcomes can be observed after implementing supply chains with the dependence on ISO 14001 and ISO 9001 (Muzaimi, Chew and Hamid, 2017; Polater, Bektas and Demirdogen, 2014). A logical consequence associated with this process is the increase in patients’ satisfaction and trust, and revenues in the healthcare industry can also rise significantly. According to Toprak and Şahin (2013, p. 112), in a hospital following the ISO standards, “it is known how the process will be handled, and thanks to monitoring individuals within the process, their strengths and weaknesses are identified and thus, it becomes possible to assign the right

task to the right person.” These processes contribute to the active integration of ISO 14001 and ISO 9001 not only into Turkish hospital supply chains but also into healthcare industries all around the world.

3.5. Summary

This chapter has presented the review of the literature on specifics of applying green supply chains in healthcare organisations of Australia and Turkey, as well as on the application of ISO 14001 and ISO 9001 in hospitals. The collected literature indicates that healthcare organisations in different countries all over the globe are on the path to applying the principles of green supply chains in order to reduce costs and promote sustainability in operations. However, there is the lack of literature on particular features of supply chains that are usually integrated into healthcare systems of Australia and Turkey.

It is important to pay attention to the fact that more research is required in this field in order to understand what tendencies in promoting green supply chains are more typical of hospitals in Australia and Turkey. In addition, the literature analysing the application of the ISO 14001 and ISO 9001 certification in the healthcare industry of these two countries is also limited in spite of the fact that researchers point at experts’ interest in this question. Therefore, it is important to draw attention to examining how the application of ISO 14001 and ISO 9001 can work as a unique framework for developing green supply chains in public and private hospitals. The next chapter describes the methodology that is used for this study in order to address its aims and research questions.

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