

AMERICAN UNIVERSITY OF BEIRUT

HOSPITALS ACCREDITATION IN LEBANON: THE
CHALLENGES AND PROSPECTS OF IMPLEMENTING THE
ENVIRONMENTAL POLICY

by
FATME MAHMOUD NASSEREDDINE

A project
submitted in partial fulfillment of the requirements
for the degree of Master of Science in Environmental Sciences
to the Interfaculty Graduate Environmental Sciences Program
(Environmental Health)
of the Faculty of Health Sciences
at the American University of Beirut


Beirut, Lebanon
April 2015

AMERICAN UNIVERSITY OF BEIRUT

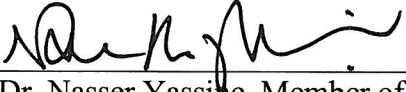
HOSPITALS ACCREDITATION IN LEBANON: THE
CHALLENGES AND PROSPECTS OF IMPLEMENTING THE
ENVIRONMENTAL POLICY

by
FATME MAHMOUD NASSEREDDINE

Approved by:



Dr. May Massoud, Associate Professor
Department of Environmental Health
Advisor



Dr. Nasser Yassine, Member of Committee
Department of Health Management and Policy
Assistant Professor



Dr. Rima Nakkash, Member of Committee
Department of Health Promotion and Community Health
Associate Professor

Date of Project presentation: April 27, 2015

AMERICAN UNIVERSITY OF BEIRUT

THESIS, DISSERTATION, PROJECT RELEASE FORM

Student Name: Nassereddine Fatme Mahmoud
Last First Middle

Master's Thesis Master's Project Doctoral Dissertation

I authorize the American University of Beirut to: (a) reproduce hard or electronic copies of my thesis, dissertation, or project; (b) include such copies in the archives and digital repositories of the University; and (c) make freely available such copies to third parties for research or educational purposes.

I authorize the American University of Beirut, **three years after the date of submitting my thesis, dissertation, or project**, to: (a) reproduce hard or electronic copies of it; (b) include such copies in the archives and digital repositories of the University; and (c) make freely available such copies to third parties for research or educational purposes.

Signature

Date

ACKNOWLEDGMENTS

I would like to thank all the people who contributed in some way to the work described in this project. I first and foremost take this opportunity to express my gratitude to advisor Dr. May Massoud for the continuous support of my project, for her motivation, and for her knowledge that she shared with me. Her guidance helped me in all times of my project. I would also like to thank my committee members Dr. Nasser Yassine and Dr. Rima Nakkash for their encouragement, insightful comments, and for their interest in my work.

Last but not least, I would like to express my deep appreciation and gratitude to my parents, Mahmoud and Zainab and my husband Mohamad Jaafar and brother Mohamad who encouraged and supported and always motivated me during my academic journey.

AN ABSTRACT OF THE PROJECT OF

Fatima Mahmoud Nassereddine for Master of Science in Environmental Science
Major: Environmental Health

Title: Hospitals Accreditation in Lebanon: The Challenges and Prospects of
Implementing the Environmental Policy

This study aims to assess the perception of stakeholders in hospitals with regards to the environmental standards in the Lebanese Accreditation manual and the impacts of their activities on the environment, investigate the challenges and incentives for implementing environmental standards and develop a set of recommendations that can enhance the implementation of these standards. Accordingly, an in-depth interview was conducted with stakeholders from 18 hospitals selected from all 6 Mohafazat and accounted for other criteria such as size and public vs private. Results were contextually and comprehensively analyzed, examined, and evaluated. Findings revealed that the majority of the stakeholders were unsatisfied with environmental standards because they were not clear, not enforceable, not applicable, and/or required improvement. The barriers to implementation are financial burden, employee resistance, relatively less qualification and awareness, and lack of support by the Ministry. Finally, possible suggested incentives for implementing environmental standards are financial support, training programs, rewarding system, and improving standards. Hence, the implementation of a national accreditation program has indirectly affected environmental performance based on the perception of this study's participants. Accordingly, recommendations that can enhance the implementation of environmental standards as required by national laws and regulations are suggested.

Keywords: Hospital accreditation, environmental standards, barriers, incentive

CONTENTS

ACKNOWLEDGEMENTS	v
ABSTRACT	vi
LIST OF ILLUSTRATIONS	ix
LIST OF TABLES	x
LIST OF ABBREVIATIONS	xi

Chapter

1. INTRODUCTION	1
2. LITERATURE REVIEW	8
2.1 Environmental Impacts of Hospitals' Activities	8
2.1.1 Hazardous Waste	8
2.1.2 Wastewater	9
2.1.3 Air Emissions	11
2.2 Process Flow Chart	11
2.3 Summary Table: Activity vs. Impacts	14
3. METHODOLOGY	14
3.1 Study Design	14
3.2 Recruitment of Hospitals	14

3.3 Data Collection	17
3.4 Data Analysis	18
3.5 Ethical Considerations	18
4 RESULTS AND DISCUSSION	19
4.1 Characteristics of Participants	19
4.2 Perception on Environmental Policies and Standards	19
4.3 Perception in Relation to Environmental Impacts	23
4.4 Challenges of Implementing Environmental Standards	27
4.5 Incentives and Motivations	31
4.6 Perception of ISO 14001	35
4.7 Prospects for the Implementation of Environmental Standards	40
5 CONCLUSIONS AND RECOMMENDATIONS	43
5.1 Conclusions	43
5.2 Recommendations	44
Appendix	
1. INTERVIEW GUIDE	46
BIBLIOGRAPHY	49

ILLUSTRATIONS

Figure	Page
1- Hospital Process Flow Diagram	13
2- Conceptual drawing of a four-level health care system	41

TABLES

Table	Page
1- Source of hazardous material discharged into hospital sewer systems	10
2- The environmental impacts of hospital activities	14
3- Selected hospitals participating in the study based on the criteria	16
4- Summary of the questions that were addressed linked to the study objectives	17
5- Summary of the barriers and incentives that were reported by the stakeholders	39

ABBREVIATIONS

CO₂ Carbon Dioxide

HAS Haute Autorite De Sante

MoE Ministry of Environment

MoI Ministry of Industry

MoI Ministry of Interior

MoPH Ministry of Public Health

MoWP Ministry of Water and Power

NCHA National Committee for Hospital Accreditation

TCHA Technical Committee for Hospital Accreditation

NO_x Nitrogen Oxides

PVC Polyvinyl Chloride

CHAPTER 1

INTRODUCTION

Hospitals and healthcare facilities have significant impacts on the natural environment as they fulfill their mission towards patients care. They contribute to environmental degradation as they consume large amounts of water and energy on one hand, and contribute to environmental pollution through the production of hazardous and non-hazardous waste, air emissions, and wastewater on the other hand. Hazardous waste may include pathogenic and infectious material, chemicals, pharmaceuticals, sharp and radioactive items, and waste with heavy metals content. Although only 10-25% of the total healthcare waste is considered hazardous, it still poses a significant adverse effect to both human health and the environment. Consequently, both national and international agencies have established numerous approaches to mitigate and control environmental impacts of the healthcare facilities (Mohamed et al., 2009).

Accreditation is one of the indirect solutions to reducing and controlling the negative environmental impacts during the delivery of healthcare services. Hospital accreditation is usually a voluntary consensus for hospital operations as it provides quality assurance and improvement in health care (WHO, 2001). The accreditation process requires that the accrediting body recognizes that a healthcare organization is complying with national standards including environmental issues. Further on, within the hospital setting a multidisciplinary team should be responsible to improve environmental management practices and performance (Ng et al., 2013).

Developed countries have been generally successful in implementing hospital accreditation for several reasons. Becoming an accredited hospital may call upon renovating the facility, changing procedures, intensively training employees, and purchasing expensive equipment and instruments to comply with standards. Furthermore, the audits and inspections are additional financial burden to most hospitals as they require fees to arrange meetings and inspections. Governments in developed countries have addressed this critical issue by providing financial incentives to encourage hospitals to apply for accreditation (WHO, 2004).

In addition, multidisciplinary teams within developed countries are responsible for developing standard instead of reaching for help from international agencies. Such standards are practical and easy to adapt to. The auditing process is also unified by training all auditing bodies. This harmonizes the auditing process and creates equity along with transparency. This is tackled by creating a link between the government and accreditation agencies to assure their limited independency. So the accreditation council is in charge of regularly supervising the accreditation program and training all auditing bodies (WHO, 2004).

On the other hand, developing countries are less advanced in this field particularly with regards to environmental standards required for accreditation, but are starting to show gradual development. A number of studies have been conducted in order to investigate the healthcare waste management. Their findings represented the challenges developing countries face including but are not limited to the lack of data on waste generation in addition to the gaps in the management framework such as the absence of suitable treatment and disposal options (Mohamed et al., 2009). Moreover, problems

arise at the legislative level either because the laws and regulations are lacking or because they are not enforced. Findings have also added that many developing countries lack financial and human resources which hinder the healthcare waste management process. Furthermore, ideal healthcare waste management in resource-limited settings is also affected by the lack of supplies and equipment (Eberle et al., 2009).

During the year 2000, Lebanon witnessed a dramatic shift in the quality of health care as it moved from the traditional objectives of physical structure to the multidimensional view focusing on managerial performance. To a certain degree, this transition included environmental control as the environmental sector is supposed to be part of the multidimensional focus. Hospital accreditation does not necessarily assure that services and care are optimal which calls for the introduction of outcome indicators that reflect the quality of health care delivery over time. In Lebanon accreditation is not mandatory by law; however, any hospital contracted with the Ministry of Public Health (MoPH) should be accredited. Moreover, the accreditation system does not mandate all standards for implementation. As such, it focuses on certain standards and neglects others such as the environmental standards (Ammar et al., 2007).

Through personal communication with a stakeholder in a certified auditing body, the accreditation process was explained. The hospital accreditation procedure is based on three main phases which includes *self-assessment*, compliance with standards chosen by a *software*, and further compliance with the *mandatory priority clauses* which are set by (Haute Autorite De Sante) HAS, a national French healthcare accreditation agency. Self-assessment is the first step a hospital has to conduct after it has prepared its physicians, nurses, and employees on necessary actions to meet up with the national standards. Based

on a checklist, the hospital is graded as *A-completely met standards, B-partially met standards, C-barely met standards, and D-failed to meet standards*. Any hospital that scores a C or a D is to be rechecked by an auditing company. The application of software includes a haphazard selection of chapters from the manual that the hospital should comply with. Selection of clauses from each chapter is randomized and changes every time an audit team is ready to audit a hospital. Finally, mandatory priority clauses are set by the HAS and includes the mandatory clauses from all 42 chapters that all hospitals should comply with. Note that out of all clauses (593) in the accreditation manual, only 99 are mandatory and happen to be linked directly to patients' safety.

The stakeholder further explained that the accreditation program includes 42 chapters. Only two chapters are concerned with the management of environmental impacts, Chapter 16-Environmental Services, and Chapter 42-Waste Management. Chapter 16 includes 15 clauses related to the existence of a competent manager for the environmental service department, orientation manual, comprehensive policy for various areas such as the operating room, quality improvement plan, and the presence of an education program. Likewise, chapter 42 which is limited to only 8 clauses also covers the presence of a coordinator for waste management department, policies and procedures related to waste segregation and handling, appropriate method of disposal of clinical waste and the existence of an occupational health and safety manual. Unfortunately, based on the selection of HAS none of these clauses are mandatory which implies that hospitals are not required to implement any of the standards related to management of the environmental impacts.

The Lebanese environmental laws and regulations related to hospitals include various aspects that deal with hazardous waste management, wastewater and water management, and air emissions. For example, decree number 13389 dated 2004, specifies the types of healthcare waste and ways of disposal. It sets the general provision including definition, goal, mechanism, classification of healthcare waste, responsibility, sorting categories, and conditions for liquid waste. It addresses the management strategy, storage and disposal of non-hazardous waste and hazardous and infectious healthcare waste. The presence of such legislative dimension calls upon developing a framework that integrates laws and regulations within the hospital accreditation program (Ministry of Environment (MoE) & UNDP, 2010).

The MoPH and HAS, the organizational and administrative bodies, have signed a cooperation agreement in order to establish a hospital accreditation program. In this respect, the two bodies established a National Committee for Hospital Accreditation (NCHA) and a Technical Committee of Hospital Accreditation (TCHA) in order to implement the program (MoPH & HAS, 2010). The NCHA, chaired by the Director General of the MoPH, is responsible for:

- Defining the accreditation process
- Coordinating the accreditation implementation
- Selecting critical standards
- Scheduling accreditation visits
- Confirming procedures
- Validating standards and benchmarks and disseminating them in Official Gazette
- Approving audit reports

- Defining level of accreditation in each hospital
- Suggesting financial incentives linked to accreditation outcomes

The TCHA a neutral entity, with the competence and reliability required to ensure the technical expertise is responsible for ensuring the controlling and supervision of all steps and actions related to the development, continuity and sustainability of the accreditation program (MoPH & HAS, 2010). It works in full coordination with the NCHA and undergoes the following tasks:

- Select audit bodies, propose the approval to the Ministry of Health, and control the audit bodies by submit a report to the Ministry of Health
- Analyze the hospital audit reports prepared by the audit bodies
- Submit the accreditation reports to the Ministry of Health

It is essential that the accreditation program be modified so that the environmental standards become mandatory as they are required by law. In view of the weak regulatory body in Lebanon, the accreditation should be used as a mean of advancing environmental policies.

Accordingly, this research project will:

- Asses the perception of employees working in hospitals with regards to environmental policies and the impacts of their activities on the environment.
- Investigate the challenges of implementing environmental standards.
- Identify possible incentives to encourage implementation of environmental standards.
- Develop a set of recommendations that can enhance the implementation of environmental standards as part of accreditation.

The findings of this project may be used to shape decisions of policy makers on the challenges that employees in hospitals face during the implementation of the environmental standard as part of the hospital accreditation program. Hence, future policy makers addressing environmental quality standards and regulations may benefit from the potential incentives and framework that can enhance the implementation of environmental management practices and improve environmental performance.

CHAPTER 2

LITERATURE REVIEW

2.1 Environmental Impacts of Hospitals' Activities

2.1.1 Hazardous Waste

Hazardous waste may include pathogenic and infectious material, chemicals, pharmaceuticals, sharp and radioactive items, and waste with heavy metals content. Although only 10-25% of the total healthcare waste is considered hazardous, it still poses a significant adverse effect to both human health and the environment. Literature shows that such type of waste is very critical especially when it enters the municipal solid waste stream and impacts the environment (Mohamed et al., 2009). Other environmental concerns are the mismanagement of chemical and pharmaceutical waste. Because of their composition which may be corrosive, reactive, or flammable, they can easily harm human health and the environment. When coming in contact with humans they can cause burning and if they are burnt they can either produce toxic fumes or explode. The greater concern is landfilling these types of waste in unlined landfills. The leachate of these wastes may contaminate ground water and consequently threaten people utilizing this water source for drinking, bathing, or cooking purposes. Additional threat is to the local ecosystem including water depending vegetation and animals depending on this water source (USAID, 2007).

If not treated properly, medical waste poses a risk onto the environment. Incinerating hazardous waste may cause air pollution as it produces toxic pollutants such as Nitrogen Oxides (NO_x) and acid gas. Because some air pollutants such as dioxin and heavy metals do not biodegrade and accumulate in higher concentrations in the food

chain, this also poses another environmental threat. At higher concentrations, dioxin is believed to be a cancer causing agent and heavy metals such as mercury and cadmium may cause birth defects (USAID, 2007).

Little attention is received in developing countries when it comes to medical waste management. The mismanagement of such types of waste is alarming as some countries such as Bangladesh dispose their medical waste with domestic waste posing a serious public health threat (Hassan. H et al.,2008). To reduce health risks and environmental impacts, it is essential that medical waste is treated properly. This requires managing medical waste from its source because such improvement significantly reduces the negative impact on the environment and public health (Hassan. H et al.,2008).

2.1.2 Wastewater

Unlike regular urban wastewater, wastewater from hospitals may contain potentially hazardous components. This is why hospitals should be connected to efficient wastewater treatment plants because municipal sewer networks may not be designed to treat such type of water quality. Table 1 summarizes the source of different hazardous characteristics of water discharged into hospital sewer systems (WHO, 1999).

Table 1- Source of hazardous material discharged into hospital sewer systems

Component	Source
1. Microbiological Pathogen	-Outbreaks of diarrheal diseases -High concentration of enteric pathogens (bacterial species colonizing the digestive tract) -Example: Clostridium difficile, Salmonella enterica, and Bacillus cereus
2. Hazardous Chemicals	-Detergents used by housekeepers -Chemicals used during disinfection operations
3. Pharmaceuticals	-Drugs used by hospital pharmacy -Example: Antibiotics and Genotoxic drugs.
4. Radioactive Isotopes	-Drugs with unstable nucleus and with excessive energy -Discharged from oncology departments
5. Related Hazard	-Periodically reported outbreaks ie. Cholera -Patients requiring radiation therapy or chemo therapy

Most of the coastal areas of the world and especially in developing countries and in over populated urban regions have been reported to be damaged from pollution. Some of the main sources of pollution are discharge of municipal wastewater, solid waste disposal, release of concentration of pollutants from industries which may be harmful, and the disposal of radioactive and hazardous waste. By far, the greatest amount of waste discharged into nearby rivers or aquatic systems is sewage. Sewage effluents usually contain municipal wastewater, industrial wastewater, and hospital wastewater. Sewage in itself contains a diverse range of pollutants such as organic substances, pathogens, heavy metals and trace elements. In nature sewage is organic and is subject to bacterial decay. This bacterial activity reduces the oxygen concentration in the water which in return starves organisms from oxygen and leads to the breakdown of protein. This causes hydrogen sulphide and ammonia to be released into the water system and poses harm to

marine organisms because such compounds are potentially toxic. At the long term, some of the effects of these harmful substances include mass mortality of fish that have been feeding on contaminated water (Islam et al, 2004).

2.1.3 Air Emissions

Like any other institution, hospitals contribute to environmental degradation through air pollution. Air pollution may result from different activities one of which is the utilization of fossil fuels to produce electricity and heating purposes. Types of energy are natural gas, heavy or light fuel oil and external supply of electricity. Power plants significantly contribute to air pollution through Carbon Dioxide (CO₂) emissions which is associated with climate change. Another source of air pollution is the emission resulting from sterilization. This process requires a toxic and environmentally hazardous gas known as ethylene oxide. This gas poses a high risk to employees exposed to it because at room temperature it is flammable, carcinogenic and mutagenic; consequently it is recommended to use an alternative such as hydrogen peroxide (MoE & UNDP, 2010).

2.2 Hospital Process Flow Chart

As previously mentioned hospital service provides patient care yet it also causes environmental pollution. If we take a look at the hospital flow, we see that each department produces different impacts but in general they are mostly common. Figure 1 shows that administrative offices produce regular waste, wastewater, and air emission from the machines used (computers, scanners, printers and so on), and the use of electricity. The second path shows that departments such as medicine, surgery, operating rooms, delivery, coronary care unit, and intensive care units produce more significant environmental impacts such as the hazardous waste which are usually contaminated with

patient body fluids or may also be human organ from surgeries. This path also produces contaminated wastewater from patients with different viral infections. Path three is most concerning because departments which provide chemotherapy such as the chemo-department and oncology produce chemo-waste. X-ray departments produce emission, hazardous and regular waste, and wastewater. Finally, laboratory work is also significant because it produces hazardous waste from the body samples that are taken, and it produces contaminated wastewater as a result of the body fluids discharged with wastewater (Environment Science Center, 2003).

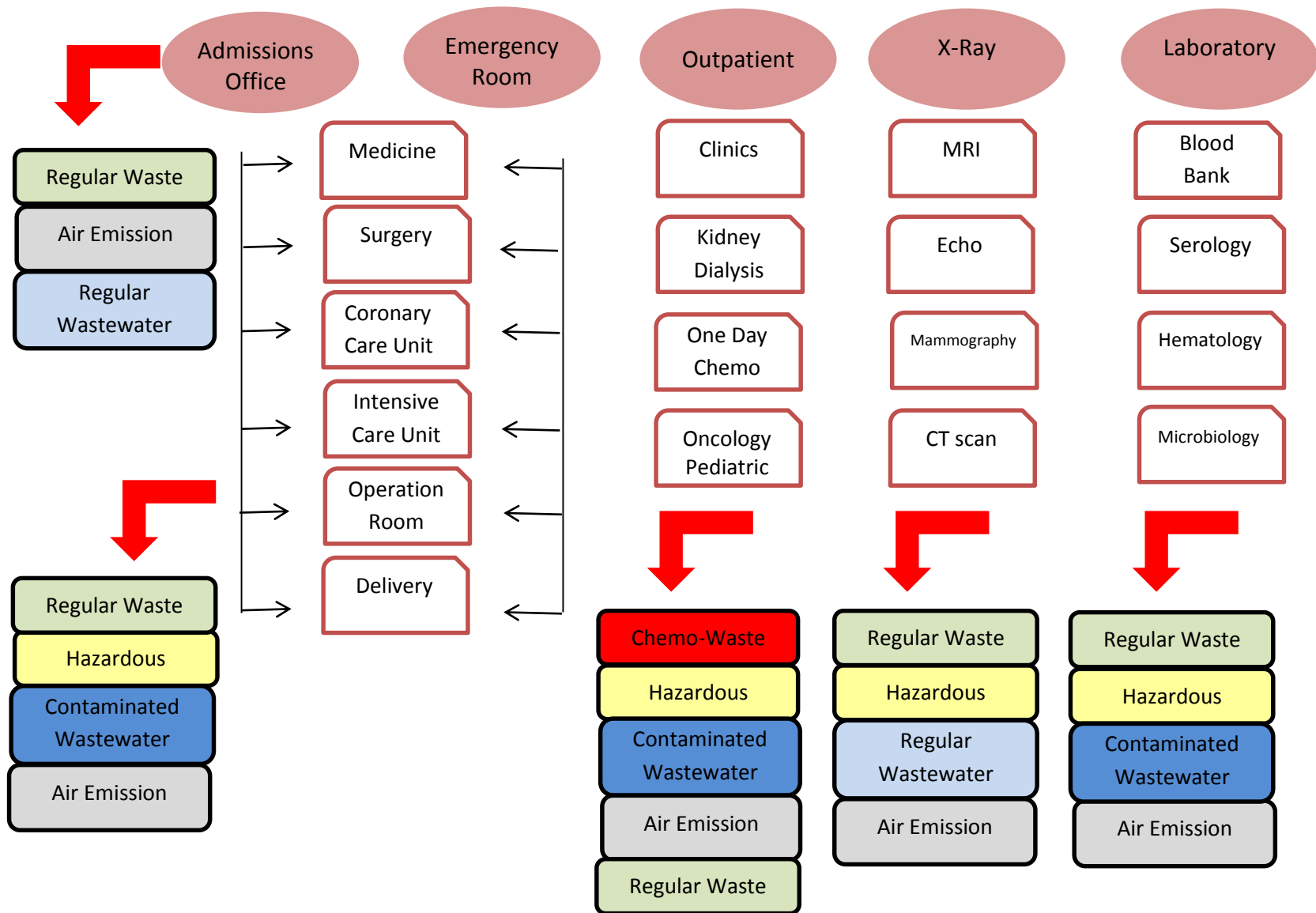


Figure 1- Hospital Process Flow Diagram (Environment Science Center, 2003)

2.3 Summary Table: Activity vs. Impacts

Table 2- The environmental impacts of hospital activities

Activity	Source	Environmental/Health Impact
1. Regular Waste Generation	<ul style="list-style-type: none"> • Offices • Patients Rooms • Visitors 	Production of methane gas, which is a greenhouse gas if waste is improperly managed
2. Hazardous Waste Generation	<ul style="list-style-type: none"> • Operations • Sampling • Treatment 	Incineration leads to air pollution May contaminate groundwater through leachate
3. Chemo Waste Generation	<ul style="list-style-type: none"> • Chemotherapy 	Contaminates water bodies Destroys ecosystem Causes health implications i.e. endocrine disruption, reproduction complications and affects development and behavior
4. Regular/Contaminated Wastewater Generation	<ul style="list-style-type: none"> • Offices • Cleaning • Kitchen • Visitors • Patients with particular disease • Body fluids discharged • Lab work 	High amounts of biological content Destroys ecosystem Threatens human health
5. Air Emission Generation	<ul style="list-style-type: none"> • Electricity consumption • Heating system 	Air pollution such as CO ₂ Climate change Lung cancer, asthma, and respiratory diseases

CHAPTER 3

METHODOLOGY

3.1 Study Design

Qualitative method, specifically the in-depth interviews was adopted as it allows the collection of a great deal of detailed data within a short time-period. In-depth interviews are usually less structured and depend on open ended questions that guide the respondents through. This approach gave all stakeholders the chance to thoroughly explain their experiences and opinions towards the implementation of environmental standards. Considering that there is a gap on the environmental implementation of standards in Lebanon when studying the literature, this approach as Brikci N. (2002) states “is used on topics for which little is known and where it is important to gain an in-depth understanding”.

3.2 Recruitment of Hospitals

The purposive sampling which is based on setting selection criteria for participants was followed (Mack et al., 2011). It allowed the researcher to group all possible hospitals and select 18 hospitals to take part in the project. In this case, the selection criteria were:

- Hospital Accreditation: all selected hospitals should have passed the accreditation process
- Location: representative distribution per Muhafaza allowed the researcher to sample hospitals from all Muhafazat in a representative manner. This included Beirut, Mount Lebanon, Beqaa, Nabatieh, North and South Lebanon.

- Sector: it was critical to choose hospitals from the private and public sector as this gave us the chance to study the barriers and experience of both.
- Size: the number of beds and capacity of a hospital.

Table 3 presents the designated hospitals that are recruited in our project based on the four aforementioned criteria.

Table 3- Selected hospitals participating in the study based on the criteria

Sector	Size	Beirut	North Lebanon	South Lebanon	Mount Lebanon	Bekaa	Nabatieh	Total Hospitals
Public	Large	1	-	1	-	1	1	4
	Small	-	1	-	1	-	-	2
Private	Large	1	1	1	1	1	1	6
	Small	1	1	1	1	1	1	6
Total Hospitals		3	3	3	3	3	3	18

*Number of beds less than or equal to 100: small

*More than 100: large (Saleh et al., 2013)

Three hospitals were recruited from each Mohafaza. One small private hospital and one large private hospital were selected for recruitment from each Mohafaza. However, the size of public hospitals was randomly chosen among the Mohafazat So all together, 6 large private hospitals and 6 small private hospitals were selected. And finally, 4 large public hospitals and 2 small public hospitals were recruited.

After seeking approval from the hospital CEO, stakeholders belonging to the Quality Control, Quality Assurance, or Environmental Services Departments were provided by a soft or hard copy of a mail which explained the objectives of the interview. Stakeholders were also provided with a copy of the interview guide prior to the interview. A few days later stakeholders were contacted through phone calls to set an appointment for the interview. Through the website of the Syndicate of Hospitals which provided the contact information of facility directors and stakeholders, facility directors were

contacted via phone and requested their participation. Upon their approval, interviews were carried out in Arabic with the stakeholders.

3.3 Data Collection

Data collection included direct interaction to ensure the richness of the data derived from face to face interviews. As previously mentioned, the interviews were not structured; however, the interview guide assisted the interviewer as it laid out the objectives to be met. The collection technique in this case was note taking, transcribing the interview and later analysing it. Note that some of the stakeholders refused to record the interview. Table 4 summarizes the in-depth questions of the interview guide related to the study’s objectives.

Table 4- Summary of the questions that were addressed linked to the study objectives

Objectives	Questions
Asses the perception of employees working in hospitals with regards to environmental policies and the impacts of their activities on the environment.	<ol style="list-style-type: none"> 1. What is your opinion on environmental policies/standards in the accreditation program? 2. What are the impacts that your hospital has on the environment? 3. In your opinion, are these impacts significant and important to mitigate and prevent?
Investigate the challenges of implementing environmental standards	<ol style="list-style-type: none"> 1. What are the obstacles faced when implementing environmental standards?
Identify possible incentives to encourage implementation of environmental standards.	<ol style="list-style-type: none"> 1. What are the incentives that would encourage you to implement these standards? 2. Do you think receiving an environmental certificate, such as ISO 14001, in addition to accreditation is an incentive?

3.4 Data Analysis

After the necessary data was collected, the *content analysis* technique was used to analyze the information. It required classifying, summarising, and tabulating all data. The basic process of analyzing the data is by recognising differences and similarities between all interviews. Categorizing the data was done by extracting common themes from all interviews and tabulating them to better understand the barriers and experiences of selected hospitals regarding environmental standards (Hancock et al., 2002). Additionally, qualitative data analysis was approached systematically to prevent outcomes subjectivity. Finally, results and discussions of each theme were reported.

3.5 Ethical Consideration

The interview is intended for academic research purpose only. No sensitive information related to subject's reputation or insurability was gathered. Likewise, no information that will cause psychological harm if disclosed outside the research was gathered. Data is solely used for the purpose of the project and is properly controlled, managed and retained by the Principal Investigator. There are no perceived direct or indirect risks or benefits associated with humans' participation in the project and respondents' participation is voluntary. A written informed consent, including the project objectives and all relevant details, was provided to and signed by participants prior to the start of administering the questionnaire.

CHAPTER 4

RESULTS AND DISCUSSION

4.1 Characteristics of Participants

The dates of the hospital's establishments varied from 1902 to 2014 the most recently established hospital. So the difference in the established date is 112 years. This implies that the oldest hospital, Beirut H1, had more experience than the most recent hospital, Mount Lebanon H3. Moreover, the total number of employees varied between 50 to 1,400 employees. The year of receiving first accreditation also fluctuated between year 2000 to year 2012. Note that all hospitals have received and still maintain their accreditation status except for Bekaa H1. Bekaa H1 is a public hospital so it could not maintain its first accreditation until the second survey due to its high financial burden.

4.2 Perception on Environmental Policies and Standards

The perception of stakeholders on environmental standards that are part of the accreditation program varied as being unclear, not enforceable, not applicable, require improvement, lack environmental aspects, or as being fair and basic.

The majority of the stakeholders perceived the standards as being not applicable. They explained that implementation most of the time was difficult. More precisely hospital infrastructure hindered the applicability of the environmental standards. For example, some hospitals are constructed in a manner that does not respect the positive flow of the waste collection traffic inside the hospital. This implies there is a higher possibility of infection transmission. Research shows parallel results. The applicability of

standards may be challenging to Lebanese hospitals because the objective of the new standards has shifted towards more specific targets. Another explanation may be because standards were set independently and the current situation of hospitals was not examined and taken into consideration. A study explored the views of stakeholders in Lebanese hospitals on the expenses of accreditation and 77.1% responded infrastructure maintenance was a burden (Saleh et al, 2013).

Another obstacle that hinders the applicability of environmental control is the absence of an efficient on-site treatment of hospital sewage. As previously mentioned, wastewater generated from hospitals is contaminated and requires specific treatment prior to discharge. However when hospitals were constructed, the sewer lines were connected with the municipal networks only. Accordingly, it is difficult to demolish and reconstruct a new system in already existing hospitals.

Most of the stakeholders considered the environmental standards as being unclear and difficult to understand and implement. This is because they are too general and vague and don't always specify the objective of each criterion. When compared to the literature, El Jardali et al present similar results in a study conducted with the collaboration of the MoPH with respect to the challenges of implementing accreditation standards. In general their findings showed that many of the employees are finding it difficult to implement the standards because the concept of accreditation is new and unclear (El Jaradali et al, 2013).

Respondents also explained that the language of the standards was difficult to understand and they preferred that a new clearly worded standard be established.

Further on, another common challenge that most of the stakeholders reported is the lack of sophisticated environmental aspects within the environmental standards that should address specific environmental problems. This is evident in the Waste Management Chapter which does not address the treatment of chemo and cytotoxic waste in addition to expired drugs. This can be explained by the expensive treatment methods which is ultimately not feasible for Lebanese hospitals. Hospitals may not have enough space to store chemo waste prior to shipping abroad. If hospitals are to adopt the Basel Convention, they will need a large storage area in order to store their waste. Likewise, shipping also costs high amounts of money which may be beyond the financial capability of most hospitals.

To a lesser extent, some of the stakeholders believe that the environmental standards require further improvement for various reasons. When asked to explain why, one of the small hospitals in South Lebanon responded that,

“There exists a lot of useless documentation. Standards should concentrate on managing environmental issues instead of concentrating on managerial issues”.

Others added that policies and standards should complete each other because they both have common goals and should work in parallel. The solution to this challenge may lie in the hands of certain governmental bodies. Designated ministries, in this case the MoE, MoPH, MoI (Ministry of Industry), MoWP (Ministry of Water and Power), and the Ministry of Interior (MoI) could all collaborate and agree on standardized laws and regulations. Then these laws and regulations should be integrated in the accreditation system by being mandatory through the environmental standards.

Unfortunately, some respondents believed that the environmental standards are not enforceable in a country like Lebanon. They further elaborated that there is no continuous inspections and audits being conducted by the National Accreditation Committee, and the MoPH, which ultimately meant that hospitals are not implementing all environmental policies correctly and as set. This may be explained by the need of constant follow-up which is important since the accreditation process is a new activity. It also gives stakeholders a chance to further discuss how implementation should take place. Consequently follow-up sessions are also important because it gives them the opportunity to evaluate their performance and adjust their performance when required.

World Health Organization explains that strengthening legal support is crucial for the effectiveness of an accreditation program especially in a country like Lebanon. It highlights that laws and regulations set by the MoPH should continuously be implemented to support the accreditation program. Unfortunately law enforcement in a developing country like Lebanon is still weak (WHO, 2003).

Weak enforcement of legislation in Lebanon may be due to the lack of responsibility that the MoPH shows towards the accreditation program. Had the ministry been aware of its entire responsibility towards this national initiative, then it would have performed its role and assured that environmental standards are being implemented according to the required guidelines. This may also be linked to the lack of a penalizing system which does not fine hospitals that fail to implement environmental standards.

Further on, lack of enforcement is sometimes a result of the overlap in responsibility by different ministries. This gap may cause the responsibility to fade away.

For instance, in this case, it would be easier for a member from the MoE to join the audits to hospitals when it comes to inspecting environmental standards.

On the other hand, a few participants find these environmental standards to be basic and fair. They find them to be acceptable for a country like Lebanon. When asked to specify why, they answered that Lebanon is an insecure country with a lot of instability because of its political situation. They added that the medium to low income status adds to the burden and to the feasibility of implementation. All these reasons allowed stakeholders to be partially satisfied with the environmental standards.

Their satisfaction with the current environmental standards could be explained by the gradual improvement towards environmental protection that Lebanon is witnessing. The positive attitude of these participants could also be explained by stronger decision making as a result of their increased awareness regarding environmental issues.

4.3 Perception in Relation to Environmental Impacts

In order to thoroughly understand the opinions of stakeholders with respect to the significance of environmental impacts, they were each required to explain how the activities they perform affects the environment. Three environmental impacts were identified, water pollution, air pollution, and the production of hazardous waste.

The majority of the participants, regardless of the Mohafaza, perceived the production of hazardous waste as an environmental impact as it contributes to soil pollution. However, the significance of the impact varied evenly as some believed this impact to be highly significant and others believed it has a negligible impact. Note that most of the stakeholders that reported this environmental impact belong to private

hospitals. It was interesting to discuss this question with the participants because those who believed they have no impact on the soil as a result of waste production assumed that since the municipality or the outsourced private waste management company is treating the waste then there are no impacts on the environment.

Research shows that hazardous waste from hospitals poses a significant impact on the environment. However, studies also show that most of hospital employees are unaware of the severity of the situation. This is why it is urgent to raise awareness and educate employees on the proper management of waste (Rajol et al, 2012).

Some stakeholders, mostly from hospitals located in Beirut and Mount Lebanon, believed their hospitals cause water pollution as they were discharging the contaminated wastewater within the municipal sewer system. This was the case because hospitals were not connected to on-site wastewater treatment plants for pre-treatment before discharging contaminated water into the municipal network system. Respondents who believed they were not contributing to water pollution explained that water contaminated by infectious diseases through urine and blood is being disinfected with hospital approved disinfectant prior to discharge. In addition, contaminated water is being diluted to reduce the concentration of infectious diseases. This corrective action is insufficient and again it reflects the lack of understanding regarding to environmental issues.

Few participants responded they are causing air pollution through the electricity generators. Likewise, they perceived this impact as being slightly non-significant. First of all, this may be due to the lack of awareness related to the possible types of environmental pollution. More importantly this may also be a result of the weak

enforcement of laws and regulations set by the MoE. The perception of these participants highly reflects the insufficient effort the Ministry of Interior (MoI) and the MoE have been doing because if these ministries have been enforcing laws then the perception and understanding of stakeholders would have been different.

Research shows significant negative impacts on air quality from hospitals. Hospitals should implement pollution prevention strategies to comply with national laws and regulations on one hand and to minimize impact on human health and the environment on the other hand. A critical threat to air quality is Polyvinyl Chloride (PVC), which is a main component in plastic products such as IV bags. It is also used in surgical tubing, medical supplies and may be found in construction material. When incinerated, PVC is transformed into a toxic air pollutant. An alternative component is Polyurethane or Nitrile which cause less harm (EPA, 2005).

It is interesting to find out that very few stakeholders believe they do not contribute to any negative environmental impacts while performing their services. One of the stakeholders noted,

“We are a small hospital so there are no environmental impacts that we are producing. Besides, all hospitals have environmental impacts. It is not only us”.

While another respondent explained that,

“We are not polluting the water because we are a small hospital and don’t have a lot of workload. All in all we do not have any environmental impact.”

The response of both these stakeholders does not necessarily mean there are no sources of environmental pollution. Any organization is likely to cause environmental

pollution while delivering its' service. The above quotes reflect the weak environmental knowledge of the interviewed stakeholders. The false association between environmental pollution and workload may be a result of the lack of awareness. Based on the participants understanding, this finding implies that little workload means there is no environmental impacts, which is defiantly incorrect. Similarly hospital size is also associated with the production of environmental pollution as both hospitals are small hospitals.

Note that one of the participants blames other hospitals for causing environmental pollution. This statement reflects that stakeholders are aware of environmental pollution but they are unable to control it for different reasons. This may be due to financial issues, lack of environmental enforcement, or staff resistance.

On the other hand, very few stakeholders perceived their hospitals are causing all types of impacts which are water pollution, air pollution, and waste production to a significant amount.

There is no correlation between hospital impact and Mohafaza because some stakeholders in hospitals that are located in Beirut perceived they were contributing to all environmental impacts while stakeholders in South Lebanon, consider causing much less environmental pollution. Note that both Beirut and South Lebanon are urban areas, yet respondents show different behavior and understanding.

4.4 Challenges of Implementing Environmental Standards

The second objective is to investigate the challenges and barriers stakeholders face when implementing environmental standards. The most common barriers reported are financial burden, lack of support by the Ministry, employee resistance, lack of qualification and awareness, and lack of environmental services.

The majority of the stakeholders, irrespective of the Mohafaza, size, and sector of the hospital, responded that implementing the standards is a financial burden. They explained that for proper implementation of the standards, the hospital requires financial feasibility for services such as treating waste, training employees, conducting external audits, renovating the hospital when required, and purchasing items and equipment to meet up with the standards. Similarly, literature shows that areas which are an additional financial burden to hospitals include training staff, expenses for external consultancy, infrastructure maintenance and purchasing new material and equipment (Saleh et al, 2013).

Due to limited financial resources, it may be difficult for stakeholders to easily hire qualified employees, purchase new equipment to implement the standards, or afford the cost of surveys. This obstacle could be mitigated through external interventions by the government and donors to provide financial support for at least three years. Longer support periods should be planned in poorer countries. If this is not done, accreditation will only attract high-end facilities and environmental standards will not be implemented by relatively less income hospitals. To provide long-term support through financial incentives, such programs may contract with governmental bodies to fulfill required payments or agree on pre-approved payment rates by other payers (Montagu, 2003).

Similarly, most of the stakeholders belonging to small and private hospitals perceived employee's mentality and resistance as being a challenge. The respondents answered that the resistance of employees makes it very difficult to implement these standards. They elaborated that training staff and employees is always a hassle because of their mentalities and convincing them to perform differently is very challenging. Unlike the literature, the resistance of employees was mostly reported by stakeholders in small to medium hospitals. Studies show that employee resistance is more common among medium to larger hospitals. This is because such types of hospitals usually consist of a larger group with heterogeneous mentalities, in addition to the hierarchically organized staff. All these reasons hinder the implementation of standards. Smaller hospitals are often based on a more homogeneous culture and mentalities (Al Jardali et al, 2008). Note that resistance to behavioural change and attitudes by employees at the hospital level is one of the most common causes of failure to comply with standards (WHO, 2003).

Resistance to changing employee behavior can be explained by the lack of involvement in such types of changes and new initiatives. Some of the reasons behind employee resistance may be age and anxiety. Older individuals may likely show more resistance to change because it becomes challenging to convince them to change their behavior. Similarly, anxiety resulting from the increased overload and of the possibility of failure may also push to employee resistance.

Further on, the lack of qualification and awareness is a challenge most of the stakeholders complained from. It is essential to have qualified supervisors that are responsible for implementing each clause in the environmental standard. Qualification reflects awareness and competency of the individual in charge. The supervisor should

constantly carry out self-evaluation to ensure compliance with standard criterions. Some of the respondents explained that if they have more qualified employees then the implementation would be easier and more successful. This highlights the importance of qualification which is a key element to the success of standard implementation. Lacking dedicated individuals with the required skills may hinder the implementation process. The presence of qualified personnel is very crucial because it is the first criteria for both the environmental services and waste management chapters. In addition, each job description now outlines the education requirements, skills, and competencies to each service provider.

Some developing countries have addressed this weakness by offering franchise programs for compliance with hospital accreditation. Pakistan for example offers Green Star, and India offers Janani. These organizations grant individuals effective implementation of standards because it qualifies them through concentrated training. The intensive involvement of employees facilitates implementation because of their new understanding and perception towards environmental control measures (Montagu, 2003).

Some of the participants reported that the lack of environmental services is a barrier they face. As previously mentioned, the lack of management of chemo waste, cytotoxic waste, and expired drugs leaves a lot of employees clueless as to how to manage and deal with these contaminants. This is the case because both environmental chapters do not address treatment methods or alternative services to treat these types of hazardous wastes.

And finally, few stakeholders perceived that the lack of support by the ministries is a barrier. One of the public hospitals in Beirut explained that,

“We need the government to support us with detailed standards. A consultant that is ready to train us and advise us when needed should always be available. We simply want a specific person as a reference to guide and train all hospitals on the same approach”.

Involving the MoPH and international agencies for support is beneficiary because it may assure follow- up, communication, and collaboration between the hospitals and governmental bodies.

Novaes et al (2000) shed light on the importance of the support of the MoPH towards hospitals. They elaborate that support can take place by first establishing a task-oriented multidisciplinary team in order to review existing standards and develop new standards that are more applicable for all hospitals. Their study emphasizes the need to fund hospitals in order to implement environmental standards with the support of other agencies. The responsibility of the MoPH doesn't end here, as it shall diffuse workshops to reassure that accreditation is well organized, reliable, and holds practical outcomes. This legislative support sheds light on the importance of strong leadership by the MoPH for the accreditation process to succeed (Novaes et al, 2000).

It's worthy to note that very few stakeholders reported they did not face any difficulties and problems when partially implementing the environmental policies to be in compliance with the law. Correlating this finding to the previous question related to their perception on environmental standards and policies, participants showed they are unsatisfied, yet on the other hand they were not facing any types of challenges during

implementation. These two contradicting results reflect the lack of trust that participants have towards the governmental bodies

This could be a result of the previously explained challenge which is the weak legislative condition. The lack of environmental knowledge may be due to little if at all any training programs and intensive workshops that are being conducted for the employees. The absence in follow-up review sessions may also lead to the lack of environmental awareness among stakeholders. This in return may leave them with limited understanding with regard to the significance of their negative environmental impacts as they perform their services.

4.5 Incentives and Motivations

The third objective is to identify possible incentives to encourage the implementation of environmental standards among stakeholders. The most common incentives that stakeholders reported are establishing training programs and workshops, providing financial support, improving standards, and creating a rewarding system.

The majority of the stakeholders responded that providing them with workshops and training programs to further understand the environmental and waste chapters would be a good incentive. Hospitals in Bekaa and Mount Lebanon noted respectively,

“They should organize more workshops. We also want extended and advanced training sessions for each chapter”.

“There should be more communication with the MoE through organized workshops to inform us about new laws because we sometimes find out about laws after there has been a catastrophe”.

The struggle to comply with standards can be explained by the lack of training programs. Stakeholders may be finding it difficult to overcome this challenge because they require staff training to become more competent and skilled. Again this is the responsibility of legal authorities as they should follow up and train hospital employee to ensure continual improvement. A study conducted in Uganda regarding the incentives and barriers to implementing national hospital standards emphasizes that external consultation and feedback on how standards should be dealt with is critical. Specific training is also required because staff should be professionally educated and skillful (Bateganya et al, 2009).

Most of the participants reported that financial support is also beneficiary incentive that they need in order to implement the environmental standards properly. Note that more than half of those who required financial support are public hospitals. This may be due to relatively less income that public hospitals have in return because they serve patients with low-income statuses. They described that some of the financial support could be through donations of items and equipment such as waste bins with foot pedals, reduced cost for audits, and so on. They also went on and recommended that the expenses of waste treatment should be shared by the MoE. One of the participants belonging to a small private hospital in Bekaa suggested that there be waste treatment facilities per mohafaza. This could be established by the collaboration between the ministries and the municipality. By doing so the cost of hazardous waste treatment would be less competitive and thus would cost less. Financial incentives can also be used to purchase sophisticated equipment and to develop plans to further improve the hospital's performance (Ammar et al, 2007).

The stringy accessibility of loans may also be a barrier to the implementation of standards. The accreditation agency can set contracts with banks to facilitate the loaning process for hospitals that aim on complying with standards. This initiative would be encouraging for the implementation of environmental standards because it reduces the financial burden. Smits and her colleagues suggested a financial incentives that is applicable and useful for developing countries. They recommended that accreditation agencies supply affordable loans for any type of facility renovation and improvement. Loans can also help hospitals to overcome resource deficiencies which prevents them from complying with standards (Smits et al, 2014). Similarly, Japan compensates the financial burden that requires investment in equipment and technology through the support of government financial institutions. They are responsible for providing preferential taxation, low interest loans, depreciation payments and tax exemptions. This initiative is especially encouraging in hospitals facing difficult economic circumstances (JICA, 2005).

Some of the participants perceived that improving the environmental standards would be a good incentive. One of the common suggestions is to include a wastewater treatment clause within the Environmental Services Chapter. The two chapters also lack other aspects. For example the Environmental Services Chapter mentions absolutely nothing regarding air and water quality. Improvement could start by introducing standards in order to tackle the limitation of air pollutants. Consequently, contaminated water would be addressed especially that hospitals produce large amounts of wastewater that should not be discharged with the municipal sewer system prior to pre-treatment.

Establishing a rewarding system for hospitals that comply with the standards is an incentive that was reported by few stakeholders. They elaborated that this could be done through dispersing the names of good standing hospitals in the newspaper and the media. The participants insisted that the rewarding system be a non-tangible reward. Recognizing their performance would motivate and encourage them to maintain and improve such performance. A rewarding system may highly encourage the implementation of standards especially that accreditation in Lebanon is voluntary. This may also be competitive to hospitals because we are now in an era of continuous improvement of health care services, and this calls for continuous improvement through the accreditation. Another possible interlinked incentive to publically indicate that a hospital has received accreditation is the financial effect as this will attract more patients because of the quality of care that may be provided.

Studies support this result and emphasize the need of rewarding stakeholders instead of penalizing them because it is a more successful approach. By doing so MoPH would encourage them on the implementation by recognizing their performance. This study also explained that it is not always correct to penalize stakeholders because assessing the need for fining them should be associated with the availability of resources (Bateganya et al, 2009). Public reporting of accreditation results is also considered a rewarding incentive in the literature because it attracts more patients to these accredited hospitals. This approach is of high value especially to countries that are in their early stages of developing accreditation programs. However it is important that publication of scoring schemes does not harm any of the hospitals, so it is important to know how to report results at the right level without causing any damage (Smits et al, 2014).

It is worth mentioning that one of the stakeholders belonging to a public hospital located in North Lebanon reported that they did not require any incentives and they perceived producing no environmental impacts. When examining the contextual situation, this hospital happens to be a public and small hospital of 15 beds, and is located in a rural Mohafaza. The respondent may have perceived having no environmental impacts in addition to requiring no incentives due to different factors. As previously mentioned most stakeholders showed similar subjective assessment which is associating environmental impacts with workload. This associate may be explained by the amount of environmental outcomes, waste production for example, which is negligible with respect to larger hospitals. In addition, small hospitals produce less amounts of contaminated wastewater compared to larger hospitals.

This subjective assessment reflects the lack of knowledge and awareness of stakeholders regarding environmental standards. This could also mean that hospital directors should assign such positions to more qualified individuals.

4.6 Perception of ISO 14001

The second question addressed in order to reach the third objective is whether or not participants considered that receiving an environmental certificate, such as ISO 14001, in addition to accreditation is an incentive. More than half of the participants are not interested in receiving ISO 14001. The main driving factors that stakeholders reported are that ISO 14001 is not applicable, it's too expensive, they are already accredited by the Lebanese Accreditation Program, or they were not interested in environmental matters.

The majority believed that ISO 14001 is not applicable in their hospitals. This may be because of the unsound policies and ineffective regulations which do not support such an initiative. Weak enforcement of environmental laws may also play a major negative role in discouraging receiving environmental certificates. As previously mentioned stakeholders should be more involved and aware of environmental issues. Thus for stakeholders to value and truly be interested in ISO 14001, there should first be more workshops and training sessions that introduce this complex initiative. A stakeholder in a public hospital in Mount Lebanon responded that, *“We are very interested in such a certificate but I can’t decorate my house if I haven’t built it. We first need documents, enlightenments, help, and financial support to implement ISO14001 and unfortunately we lack them all here in Lebanon”*.

This response emphasizes the need for legislative support in order to comply with the guidelines required by ISO 14001. This does not only require social support but there is a need for financial support especially that Lebanon lacks basic environmental service such as proper treatment of wastewater treatment plant.

Research shows different embedded reasons which make ISO 14001 unapplicable and challenging. In a developing country like Lebanon, ISO 14001 may be challenging due to the lack of appropriate infrastructure such as well-maintained sewer systems, power supply, waste management treatment plants, and wastewater treatment plants. The presence of such services is the basic requirements for the success of ISO 14001(Massoud et al, 2010).

In addition some participants responded that this certificate requires high financial maintenance in which they could not afford. A stakeholder in a hospital in Nabatieh elaborated his stand on this issue by explaining that,

“We need the financial capability to implement ISO 14001. It requires a lot of finance and investment. Our budget does not really help”

Moreover, few stakeholders believed that there is no need to receive ISO 14001 if they are already accredited by the MoPH. In their opinion this is enough and they are not willing to put in extra effort in order to receive an environmental certificate. They preferred improving their current condition and medical status. This went hand in hand with the respond of some participants who are not even interested in environmental matters. They preferred investing in patient safety and the quality of service. A respondent in a large private hospital in Bekaa explained that,

“We are not interested at all. We prefer concentrating on implementing the Lebanese standards instead. Our goal is to only pass the environmental standards and bypass any punishments because there is no incentive for implementing the Lebanese Accreditation program”

The stand of these participants could be explained by the lack of encouragement to receiving ISO 14001. This may be due to the absence of an added value to receiving environmental certificates. If at the national level, ISO 14001 is perceived differently with more added values, then this may encourage hospitals to plan on receiving it.

On the other hand some stakeholders showed positive attitude towards receiving ISO 14001. The reason behind their interest is not very clear because the concept of ISO

14001 is still very new to them as some have not come across it. A stakeholder explained that,

“Our priority is to implement the laws and regulations first. Later on we would like to receive ISO 14001 because accreditation is not enough to control environmental issues”

Literature explains the motivation behind receiving ISO 14001 to be numerous. Lots of institutions strive for receiving ISO 14001 because it improves documentation and organizes environmental activities. In addition, it increases legal certainty by improving local image. It also encourages and motivates employees. Other long term benefits are reduction in resource use which ultimately results in increased cost savings. On the long run, ISO 14001 also creates a competitive working environment with a definite positive market effect (Morrow & Rondinelli, 2002).

Table 5 summarizes the barriers and incentives respondents revealed through the interviews. Based on these inputs suggested mitigation measures are proposed.

Table 5- Summary of the barriers and incentives that were reported by the stakeholders

Barrier	Incentive	Potential Mitigation Measures
1. Financial burden	Financial support	-Supplying affordable loans -Tax exemption -Donations of items and equipment -Reduced cost of audits -Government financial institutions should provide: preferential taxation, low interest loans, and depreciation payments
2. Lack of support by the ministry	Workshops and training Programs	-Hold national seminar on hospital accreditation -Prepare workshops and training programs between ministry and hospital staff -Communicate the standards to those who must use them -Conduct revision sessions and follow-up
	Rewarding system	-Social marketing for accredited hospitals -Disseminating progress of hospitals -Publically reporting accreditation results
	Improving standards	-Integrate environmental laws and regulations within the accreditation program -Modify environmental standards so that criterions are clear and applicable to hospitals
3. Employees resistance	Workshops and training Programs	-Training programs -Periodic consultation
	Rewarding system	-Social marketing for accredited hospitals -Disseminating progress of hospitals -Publically reporting accreditation results
4. Little qualification and awareness	Workshops and training programs	- Train staff on concepts of accreditation and present the manual -Implementing plan of action for improvement -Hiring competent individuals
5.Lack of services	Improving standards	-Provide environmental control criterion for air pollution and wastewater treatment -Provide treatment methods for chemo waste, toxic waste, cytotoxic waste, and expired drugs

4.7 Prospects for the Implementation of Environmental Standards

The four-level model of the health care system is divided into four levels. Level 1 is the individual patient, level 2 is the care team which includes professional care providers i.e. physicians, nurses, stakeholders and so on, level 3 is the organization (hospital) which includes infrastructure and complementary resources; and level 4 is the political and economic environment which includes regulations and the financial aspect (Grossman JH, et al., 2005).

The barriers reported by the stakeholders can be stratified based on this model. None of the barriers belong to level 1 because patients were not interviewed and their perception on the implementation of environmental standards is inapplicable. Employee resistance and little qualification and awareness both lie in the second level which is the care team. The collective effort of this building block represents the microsystem within the organization. The role of the care team is to show knowledge and professional support towards hospitals. The presence of these 2 barriers hinders the care team level.

In addition these 2 barriers are also part of the third level which is the organization because it supports the development of the care team. Organization encompasses decision making and processes related to financial and human resources. Mismanaging the allocation of human flow and support of team work creates a gap. This gap presents the 2 barriers that stakeholders reported as employee resistance and little qualification and awareness.

Financial burden, lack of support by the ministry and lack of the availability of environmental services all fall within level 4, the political and economic environment.

This level directly influences the performance of the hospital organization because it encompasses the regulation and financial payments. The main factor that influences this level is the government through the regulation of the private-payer and through the regulation or laws and policies.

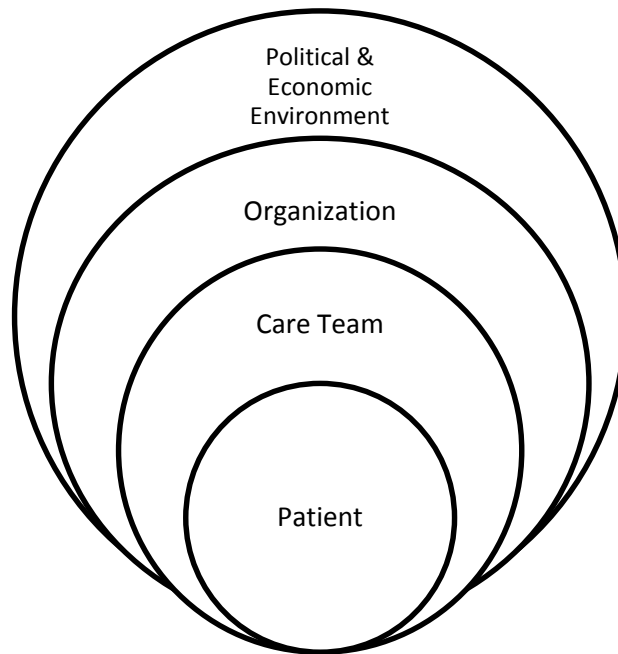


Figure 2- Conceptual drawing of a four-level health care system (Grossman JH, et al., 2005)

The decision of the National Accreditation Committee on not mandating the implementation of the environmental standards has highly affected the perception of the stakeholders regarding environmental performance. The accreditation committee focuses and enforces the implementation of standards related to patient safety and quality improvement because they are considered critical standards. Thus the main objective of the accreditation process is to improve the healthcare quality in general. By undermining environmental standards, the accreditation program is sending false messages regarding the significance of mitigating environmental pollution. This explains why respondents of this research study showed relatively less understanding on environmental problems.

Likewise, the method of random selection of the standards to be surveyed by the auditing body is not appropriate and undervalues environmental standards. It is clear that quality improvement and patient safety are improving in hospitals on the expense of the environment; hence this is what is giving off an incorrect message to hospital staff regarding how critical it is to comply with environmental standards. The decision to eliminate enforcement of environmental standards has unvalued environmental aspects and thus negatively influenced perception and practices of hospital stakeholders.

Environmental standards should become mandatory for compliance by the national accreditation committee because the MoE has also set laws that hospitals should comply with. Some of these national laws and regulations established in order to protect the environment and reduce pollution are:

1. Law no. 444 dated 2002: Law on Environmental Protection
2. Decision 52/1 dated 1996: Specifications and ratios to reduce air, water, and soil pollution.
3. Decision 8/1 dated 2001: Specifications and Standards Regarding Air Pollutants and Effluents Generated by the Classified Institutions and Wastewater Treatment Plants
4. Decree no. 13389 dated 2004: Specifying the Types of Healthcare Waste and Ways of Their Disposal

When the national accreditation committee bypasses these environmental laws by not enforcing their implementation in the accreditation process, it is indirectly influencing stakeholders on the violation of the legislative system.

CHAPTER 5

CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusions

The majority of stakeholders showed un-satisfaction towards environmental standards. Concerned stakeholders in the hospitals perceived the environmental standards as unclear, non-applicable, and non-enforceable. Participants perceived water pollution, air pollution, and waste production as negative environmental impacts hospitals are contributing to during their performance. This is identified by small and large hospitals in both private and public sectors. Waste generation and water pollution were the 2 environmental impacts that the majority of the participants had perceived they were producing. Polluting water is perceived by stakeholders from hospitals located mostly in Mount Lebanon and Beirut. However, waste generation is perceived as an environmental impact by mostly private hospitals.

The challenges that participants reported include: financial burden in almost all hospitals, lack of support by the ministry mainly in public hospitals, low awareness and qualification, employee resistance reported mainly in public and small hospitals, and the lack of alternative treatment methods mainly in hospitals located in urban areas. On the other hand, the incentives that participants reported include: financial support mainly in public hospitals, workshops and training programs mainly hospitals located in rural areas, rewarding system, and improving environmental standards.

ISO 14001 was not perceived as an incentive by most of the participants because it is considered not applicable and required high financial feasibility.

In conclusion, based on the interviews, making the environmental standard not mandatory in the accreditation manual undermines the environmental issues and affects employees' perception and practices.

5.2 Recommendations

- Mandate the implementation of environmental standards in the accreditation process in order to comply with the enforceable laws and regulations set by the MoE.
- Improve existing environmental standards by choosing clear and specific language and by including additional environmental treatment methods to mitigate and control pollution.
- Develop partnerships between private funding agencies and the National Accreditation Committee to provide financial support for hospitals to facilitate the implementation process of environmental standards.
- Provide professional training to raise awareness on environmental aspects

APPENDIX 1

– INTERVIEW GUIDE –

Qualitative In-Depth

INTERVIEW GUIDE

About the Hospital

1. Number of beds:
2. Number of employees, staff, physicians:
3. Date of establishment:
4. Date of first accreditation:

Perception on Environmental Standards

1. What is your opinion on environmental policies and environmental standards in accreditation program?
2. What are the impacts that your hospital has on the environment?
3. In your opinion, are these impacts significant and important to mitigate and prevent (to which extent)?
4. How do you address the following environmental standards in the accreditation manual?
 - Wastewater standards:
 - Hazardous waste standards:
 - Emissions standards:
5. How are they managed?
 - Wastewater
 - Hazardous waste
 - Emissions

6. Did you manage them this way before your hospital got accredited?
7. Aside from the standards, are you abiding by laws and regulation?
8. Are you aware that these mitigations measures and practices should be implemented by law even if the hospital is not implementing them for the accreditation program?
9. If it becomes mandatory will you implement them?
10. What are the obstacles faced when implementing them?
11. What are the annual expenses for implementation and non-implementation of standards?
12. What are the incentives that would encourage you to implement these standards?
13. Do you think receiving an environmental certificate, such as ISO 14001, in addition to accreditation is an incentive?

APPENDIX 2
– BIBLIOGRAPHY –

- Ammar, W., Wakim, R., & Hajj, I. (2007). *Accreditation of hospitals in Lebanon: a challenging experience. La Revue de Santé de la Méditerranée Orientale*, 13(1), 138-149.
- Bateganya, M., Hagopian, A., Tavrow, P., Luboga, S., & Barnhart, S. (2009). *Incentives and barriers to implementing national hospital standards in Uganda*. 1–6. doi: 10.1093.
- Brikci, N., (2007). *A guide to using qualitative research methodology*. Retrieved from http://fieldresearch.msf.org/msf/bitstream/10144/84230/1/Qualitative_research_methodology.pdf.
- Eberle, J., Allain, L. & Nersesian, P. (2009). *Logistics of health care waste management: information and approaches for developing country settings*. Arlington, Va.: USAID, Deliver Project, Task Order 1.
- El-Jardali, F., Ammar, W., Hemadeh, R., Jamal, D., & Jaafar, M. (2013). *Improving primary healthcare through accreditation: baseline assessment of readiness and challenges in Lebanese context*.28(4), 256-279. doi: 10.1002.
- El-Jardali, F., Jamal, D., Dimassi, H., Ammar, W., & Tchaghchaghian, V. (2008). *The impact of hospital accreditation on quality of care: perception of Lebanese nurses*. 20(5), 363–371. doi: 10.1093.
- Environment Science Center. (2003). *Greener hospitals: Improving environmental performance*. Retrieved from <http://www.bms.com/Documents/sustainability/downloads/greenh.pdf>
- EPA (Environmental Protection Agency) (2005). *Reducing air pollution from hospital*.
- Hancock B., Windridge K., and Ockleford E. (2009). *An introduction to qualitative research*. The NIHR RDS EM / YH.
- Hassan, M., Ahmed, S., Rahman, A., & Biswas, T. (2008). *Pattern of medical waste management: existing scenario in Dhaka city, Bangladesh*. BMC Public Health.
- Islam, S., & Tanaka, M., (2004). *Impacts of pollution on coastal and marine ecosystems including coastal and marine fisheries and approach for management: a review and synthesis. Marine Pollution Bulletin* 48, 624–649.

JICA (Japan International Cooperation Agency) (2005). *Japan's experiences in public health and medical systems*. Retrieved from http://jica-ri.jica.go.jp/IFIC_and_JBICI-Studies/english/publications/reports/study/topical/health/pdf/health_01.pdf.

Mack, N., Woodsong, C., MacQueen, K., Guest, G., & Namey, E. USAID. (2011). *Qualitative research methods: A data collector's field guide* (0-939704-98-6). Retrieved from Family Health International website: [http://www.fhi360.org/sites/default/files/media/documents/Qualitative Research Methods - A Data Collector](http://www.fhi360.org/sites/default/files/media/documents/Qualitative%20Research%20Methods%20-%20A%20Data%20Collector.pdf).

Massoud, M., Fayad, R., Kamleh, R., & El-Fadel, M. (2010). *Environmental management system (ISO 14001) certification in developing countries: Challenges and implementation strategies* 1.44(6), 1884–1887.

MoE & UNDP, (2010). *State and trends of the Lebanese environment* .

Mohamed, L.F., Abraham S.A., & Al-Thukair, A.A. (2009). *Hazardous healthcare waste management in the Kingdom of Bahrain*. *Waste Management*, 29(8), 2404-2409.

Montagu, D. (2003). *Accreditation and other external quality assessment systems for healthcare*.

MoPH & HAS (Ministry of Public Health & Haute Autorite De Sante) (2010). *The national accreditation procedure of healthcare organizations in Lebanon*.

Morrow, D., & Rondinelli, D. (2002). *Adopting corporate environmental management systems:: Motivations and results of ISO 14001 and emas certification*. 20(2), 159-171. doi: 10.1016/S0263-2373(02)00026-9. Retrieved from <http://www.sciencedirect.com/science/article/pii/S0263237302000269>.

National Academy of Engineering (US) and Institute of Medicine (US) Committee on Engineering and the Health Care System; Reid PP, Compton WD, Grossman JH, et

al., editors. *Building a Better Delivery System: A New Engineering/Health Care Partnership*. Washington (DC): National Academies Press (US); 2005. 2, A Framework for a Systems Approach to Health Care Delivery. Available from: <http://www.ncbi.nlm.nih.gov/books/NBK22878/>

Ng, G., Johnston, J., Leung, G., & Cowling, B. (2013). *Factors affecting implementation of accreditation programmes and the impact of the accreditation process on quality improvement in hospitals: a swot analysis*. *Hong Kong Medical Journal*, 19(5), 434-446.

Nicklin, W. (2014). *The value and impact of health care accreditation: a literature review*. Retrieved from <http://www.accreditation.ca/sites/default/files/value-and-impact-en.pdf>.

Novaes, H., & Neuhauser, D. (2000). *Hospital accreditation in Latin America*. 7(6), 425-430. Retrieved from <http://www.scielo.org/pdf/rpsp/v7n6/2359.pdf>.

Rajor, A., XaXa, M., Mehat, R., & Kunal, (2012). *An overview on characterization, utilization and leachate analysis of biomedical waste incinerator ash*. 108, 36-41. doi: 10.1016.

Saleh, S., Sleiman, J., Dagher, D., Sbeit, H., & Natafji, N. (2013). *Accreditation of hospitals in Lebanon: is it a worthy investment?*. 25(3), 284–290. doi: 10.1093.

Smits, H., Supachutikul, A., & Mate, K. (2014). *Hospital accreditation: lessons from low- and middle-income countries*. Retrieved from <http://www.globalizationandhealth.com/content/10/1/65>.

USAID (United States Agency for International Development) (2007). *Environmental guidelines for small-scale activities in Africa: environmentally sound design for planning and implementing development activities*.

WHO (World Health Organization) (2001). *Health care quality an international perspective.*

WHO (World Health Organization) (2004). *Developing hospital accreditation in Europe.*

WHO (World Health Organization) (1999). Safe management of wastes from health-care activities.

WHO (World Health Organization) (2003). Accreditation of hospitals and medical education institutions- challenges and future directions.