

**An-Najah National University  
Faculty of Graduate Studies**

# **Improvement of Available Medical Services Quality for Thalassemia Patients in Palestine**

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## *Dedication*

*I dedicate this humble work*

*To my dear father, Sohail, the only one who has believed in me every step of the way and being an endless source of love, strength, support and determination.*

*To my beloved mother, Wafa, whose affection, unconditional care and love with prayers of day and night made me able to achieve such success and honor.*

*To my twins' brothers, Mostafa, Moemen & Majd, who stand beside me all my life and constantly encourage me to strive for the best.*

*To my best friend, soul-mate, my life partner, Ibrahim, who inspires me and bright my world.*

*Thank you for everything*

*Finally*

*To all Thalassemia Patients in Palestine and the world who are struggling to be a live and to the memory of who have been passing away, I dedicate my love and gratitude and the outcome of my work.*

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أنا الموقعة أدناه، مقدمة الرسالة التي تحمل العنوان:

# Improvement of Available Medical Services Quality for Thalassemia Patients in Palestine

## تطوير جودة توفير الخدمات الطبية لمرضى الثلاسيميا في فلسطين

أقر بأن ما اشتملت عليه هذه الرسالة إنما هو نتاج جهدي الخاص، باستثناء ما تمت الإشارة إليه حيثما ورد، وأن هذه الرسالة كاملة، أو أي جزء منها لم يقدم من قبل لنيل أي درجة أو لقب علمي أو بحثي لدى أي مؤسسة تعليمية أو بحثية أخرى.

### Declaration

The work provided in this thesis, unless otherwise referenced, is the researcher's own work, and has not been submitted elsewhere for any other degree or qualification.

**Student's name:**

اسم الطالبة:

**Signature:**

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**Date:**

التاريخ:

## List of Abbreviations

|          |                                              |
|----------|----------------------------------------------|
| ANOVA    | One - Way Analysis of Variance               |
| AA       | Availability and Accessibility               |
| AHP      | Analytic Hierarchy Process                   |
| AS       | Assurance                                    |
| CR       | Customer Requirement                         |
| DB       | Dubai                                        |
| E        | Empathy                                      |
| GDP      | Gross Domestic Product                       |
| gm/dl    | grams per deciliter                          |
| GS       | Gaza Strip                                   |
| Hb       | Hemoglobin                                   |
| HOQ      | House Of Quality                             |
| JCIA     | Joint Commission International Accreditation |
| MOH      | Ministry of Health                           |
| ng/ml    | nanograms per milliliter                     |
| NGOs     | Non-Governmental Organizations               |
| PCBS     | Palestinian Central Bureau of Statistics     |
| PHCs     | Primary Health Centers                       |
| PR       | Patient Requirement                          |
| QFD      | Quality Function Deployment                  |
| QM       | Quality Management                           |
| RBC      | Red Blood Cells                              |
| RL       | Reliability                                  |
| RS       | Responsiveness                               |
| SERVQUAL | Service Quality                              |
| SPSS     | Statistical Package for the Social Sciences  |
| T        | Tangibility                                  |
| TPFS     | Thalassemia Patients' Friends Society        |
| TQM      | Total Quality Management                     |
| TR       | Technical Requirement                        |
| UAE      | United Arab Emirates                         |
| VOC      | Voice Of Customers                           |
| VOE      | Voice Of Engineers                           |
| VOP      | Voice Of Patients                            |
| WB       | West Bank                                    |
| WHO      | World Health Organization                    |

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**Improvement of Available Medical Services Quality for Thalassemia Patients in Palestine**

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**Dr. Mohammed Othman**

**Abstract**

In recent years, one of the fastest growing industries in the service sector is the healthcare industry. The rapid growth of the healthcare sector has been accompanied by many dramatic changes. These changes generated extra pressure on healthcare centers to improve their services; especially those related to genetic blood diseases like Thalassemia. In Palestine this disease is considered a difficult and chronic health problem. Despite the attempts of Palestinian healthcare centers for improving and developing their services provided for thalassemia patients, patients still confront many problems and many complains about healthcare service quality are still exist. This research aims to apply a holistic Quality Function Deployment (QFD) model in improving the medical services quality provided to thalassemia patients in Palestine. An exploratory research inquiry using a mixed methodology of both qualitative and quantitative research approaches is used to conduct the study on 291 thalassemia patients in Palestine by using a modified version of SERVQUAL instrument. It has been found that the 'Availability & Accessibility', 'Responsiveness' and 'Assurance' were the most important SERVQUAL dimension for the thalassemia patients in West Bank (WB) besides Gaza Strip (GS). Through benchmarking analysis of the best

practices among three selected competitors: WB hospitals, GS hospital and Dubai thalassemia center, the result of the descriptive analysis indicates that healthcare service quality in Palestinian hospitals is generally below patients' expectations. It has been found that the Dubai center attained the highest rate of satisfaction, while the GS hospital needs to enhance all patients' requirements because the evaluations are under average and lagging behind the competitors especially in the service dimension of 'Availability and Accessibility'. Further, WB hospitals performed better in 'Assurance' and 'Tangibility' but weaker in 'responsiveness' and 'empathy'. Furthermore, it has been found that the 'Staffing' and 'Service delivery' were the most significant technical activities categories that should be improved to satisfy the patients' priorities.

Based on the findings of the research, this study concludes to construct the six matrices of House of Quality (HOQ) that is intended to be a helpful managerial planning tool for supporting the successful implementation of TQM in the healthcare system in Palestine. Finally, to make tangible improvements; this study recommends to develop public policies and strategies concerning thalassemia disease, adopt the centralization approach in healthcare provision to thalassemia patients and training the medical staff regarding the proper management protocols of the disease.

# **Chapter One**

## **Introduction**

# **Chapter One**

## **Introduction**

### **1.1 Chapter Overview**

This chapter provides an introduction to the study accomplished. It consists of a brief description of thalassemia disease and clarifies problem statement, the importance of the research, research objectives, and research questions and presents the structure of this thesis. In addition, it includes a subheading concerning Quality Function Deployment (QFD) background.

### **1.2 General Background**

As the old famous truism said; health is a crown on the heads of the healthiest people that is only seen by the sick. Generally, from antiquity to the modern era; the human in the journey of life has lived a perpetual struggle with many diseases and epidemics. Some of them can be resisted and eliminated. Others like genetic diseases represent a difficult challenge that is not easy to resist or reduce their risks. However, fighting these kinds of diseases requires more persistence, determination and steadfastness that achieve the overcoming at the end.

Recently, under these conditions of the enormous progress of medical science, the technological development and the raising of the awareness, the emergence of genetic diseases will be unforgivable sin. Genetic blood diseases are a group of diseases which are transmitted from parents to children and accompany the patient throughout his/her life, due to the genetic cause that is a bug in the installation and component of red

blood cells. One of the most common types of genetic blood diseases is Thalassemia. It is a chronic, non-contagious, genetic blood disease passed down through families and affects blood-making. Thalassemia makes the hemoglobin in the red blood cells unable to do its job- which is the transfer of oxygen from the lungs through the airway to all body cells- and then causing anemia to patient (Giardina and Forget, 2008). This imbalance leads to disorder in the gene that controls the production of hemoglobin and excessive destruction of red blood cells (Weatherall, 2010). As a result, the affected person will need blood transfusions to compensate for the decrease in hemoglobin level. Furthermore, Thalassemia is a progressive disease that may lead to severe damage to vital organs and death to patients if not managed properly. In addition, the patient needs a specialized medical follow up and continuous psychosocial support. However, thalassemia patients can lead to a normal productive life if properly treated and provided with the needed healthcare management.

Worldwide, Thalassemia poses a serious public health problem due to the high prevalence (WHO-TIF, 2008). It is widespread throughout the world but more in some countries, such as the countries of the Mediterranean basin. Particularly, in Palestine the proportion of holders of "genetic characteristics" of the disease is equivalent to more than (4%- 6%) of the total population, the number of patients who are receiving a blood meal per month and are complaining of illness is about 863 patients in Palestine and the average living age for thalassemia patient at present is between 18-19 years (TPFS, 2013a). Unfortunately, as stated in the latest

Thalassemia Patients' Friends Society (TPFS) reports, there are 10 patients between West Bank and Gaza died due to the deadly complications since the beginning of 2016.

Patients in Palestine suffer tremendously and if the necessary medical services system is not managed with a high quality more patients will be lost. Eventually, this disease in Palestine is considered a difficult and chronic health problem. Moreover, the extent of the problem and their impacts and repercussions on the individual, the family and society in general; necessitate to be highlighted and increase the efforts to improve the quality of healthcare delivery for thalassemia patients in Palestine.

### **1.3 Problem Statement**

During the last few years, despite the considerable efforts and significant endeavors which have been accomplished by the Palestinian Ministry of Health (MOH) with all its hospitals, medical clinics and dispensaries for preventing the disease, improving and developing their services provided for thalassemia patients, patients still suffer from many problems of healthcare service quality every day for many years. This could be due to the lack of attention directed to the thalassemia patients' issues within healthcare centers.

MOH gives instructions for prevention and provision of the treatment, but unfortunately it not have a clear, spontaneous policy that focuses towards Thalassemia patients which put them at the heart of the

health work (Alkarmi, 2015). In reality, the thalassemic patients need unique care, as his or her conditions are not like other patients. It is not merely a blood or medicine issue.

In the same context, there is no remarkable staff for Thalassemia patients inside the MOH to who support them and defend for their rights. Doctors give treatment and service, but the disease is not at the center of attention at all. Unfortunately, these perceptions towards Thalassemia are still unchanged anywhere (Alkarmi, 2015).

The majority of thalassemia patients come from families with low socioeconomic status. This creates further added burden on patients' families to pay for transportation expenses to specialized medical centers in order to obtain blood, medication and conduct lab tests required to assess their vital organs status (Salman, 2015). Consequently, all these sufferings have a major psychological impact on patients and their families.

In addition, due to the limited resources at the MOH, high cost, and financial constraints, the shortage of medication and lack of medical staff and other problems will aggravate and therefore the unfortunate patient who struggles for his/her life with limited available resources and unsatisfactory medical care will complain more and more and will appeal for meeting his requirements. Currently, there is an urgent need of medical supplies for most patients facing major interruptions in their treatment due to serious shortages of these items. Yet, due to the constraints in the ministry of finance, they will not be able to acquire this medicine for



sustaining treatment (TPFS, 2013a). Finally, all of these problems and constraints will be addressed thoroughly in this research to explore the technical requirements that healthcare centers need to achieve and improve based on the fundamental patients' quality and care requirements.

#### **1.4 Importance of the Research**

Service quality is a measure of how the total service meets customers' expectations. For a successful quality improvement strategy, identifying and prioritizing customers' expectations and performing existing process assessments are important elements. Despite the importance of service quality, the inherent characteristics of services are the main obstacle to any effort for quality improvement. Although there is awareness regarding the importance of the service quality improvement; the service quality in Palestine is still lagging. As such, the health sector has been considered one of the most important service sectors which should be characterized by high accuracy and quality specifications because it is attached to the souls and lives of people and any fault is unacceptable. In reality, the Palestinian healthcare industry is unreinforced, unorganized and has many problems and constraints that may affect the service quality and performance. Thus, this will affect the patients' lives.

According to national health strategy (MOH, National Health Strategy, 2014-2016) the current strategy of MOH aspires for and focuses on providing high-quality health services for all with consideration of the unique needs of patients that ensure safe and affordable access to different

services across the various governorates in order to achieve the performance and patient/staff satisfaction; and that will be achieved through institutionalization of a national quality system and patient's safety program based on quality improvement standards. These will include raising awareness campaigns on a patient safety culture to health care providers as well as the general community and help to change and improve the mainstream administrative culture and change the attitudes and practices of health service providers and encourage citizens to accountability and ask better quality of health services.

Grol et al. (2002) emphasized that serious difficulties in healthcare delivery related to below-optimum use, overuse, or abuse of care. Health systems are occasionally risky and sometimes might hurt patients who are dependent on them in their care. There is a widespread failure in participating patients with decisions about their conditions and care decisions and stressed that these are real problems that need to be modified so that care can become safer, more efficient, and more effective. Moreover, health care services are considered as credence products that are typically intangible, unstable and immediate in terms of specific characteristics, hence there is no generic definition of quality in healthcare.

To overcome these problems and improving the performance, the healthcare centers need to restructure its management quality practices toward a system that integrates patients' ideas and needs into service design. This is could be achieved through the application of Quality

Function Deployment (QFD) technique, because its purpose is to ensure that patients' needs are taken into account in the design and development of services and they are accurately translated into relevant technical requirements throughout each stage of service improvement and development.

This research project represents an exploration to identify the 'what', 'how' and 'why' of TQM in Thalassemia units in Palestinian hospitals and to find the critical issues and characteristics that must be improved and developed in order to meet or exceed patient requirements and thereafter to support its competitive advantage in the Palestinian healthcare service industry.

### **1.5 Quality Function Deployment**

Over the past two decades, organizations experienced dramatic changes in the business environment, observed by increasing consumer awareness of quality, the revolution of technology, globalization and the competition to reduce costs. In response to these challenges, many organizations give all their concern to the concept of quality, implementing the various improved initiatives in order to enhance competitiveness and the business performance. Managers realize that profitable and sustainable revenue growth results from enhancing customer relations, because nowadays consumers are more informed, more demanding, and prone to change brands and companies if their requirements are not met on time and at a price they are willing to pay. So the business world shifts its focus from product to customer (Andronikidis et al., 2009).

Quality Function Deployment (QFD) is considered as one of the key techniques in the TQM process (Dean and Bowen, 1994). While TQM focuses on the continuous improvement of input- output effectiveness across the entire scope of the organization, QFD can be viewed as an application of the TQM philosophy for developing a new product (Lockamy and Khurana, 1995). Because of the QFD ability of embodying the broader meaning of the features of a product, QFD is not simply a quality tool, moreover it is considered as an important planning program for introducing new products and upgrading existing once (Slabey, 1990). So QFD is a comprehensive quality system for designing a product or service based on customer demands and systematically linking the needs of the customer with various business functions and organizational processes aligning the entire organization toward achieving a common goal (Mazur, 2010).

Ultimately, QFD is covering the gap between the customers whats and the designers hows (Menks et al., 2000) by translating their needs (Quality) into design and assuring that all organizational units (Function) work together by specifying their activities into finer and finer details that can be quantified and controlled (Deployment) (Lockamy and Khurana, 1995).

QFD is a systematic technique to translate customer needs into the technical characteristics of a product or service. However, QFD methodology has been applied in different functional fields and can be used

for both tangible products and non-tangible services (QFD Institute , 2010). The structure in which QFD used to organize information is known as the House of Quality (HOQ). HOQ is an assembly of matrix diagrams, which are very useful to organize the data collected, help to facilitate the improvement process (Chen and Susanto, 2003). Eventually, in this research the QFD tool can provide the methodology in the development of a total quality healthcare model for the successful implementation of TQM.

### **1.6 Aim and Objectives of the Research**

This research aims to apply the QFD model to support MOH's strategies to improve the healthcare services quality for Thalassemia patients in order to meet patient requirements and exceed their satisfaction, and thereafter to support its competitive advantage in the Palestinian healthcare service industry. This will be achieved through the following objectives:

- (1) Assessing and studying the current characteristics and quality practices that are used in medical services provided for Thalassemia patients in Palestinian hospitals.
- (2) Eexploring the critical causes that create gaps in medical service provision and identifying the factors that are enhancing the implementation of QFD model.
- (3) Improving the medical service quality by using the QFD tool in developing a total quality healthcare model.

The expected outcomes from this research look forward to introducing a holistic QFD model for enhancing the contribution of the Palestinian healthcare service industry situation toward thalassemia, and provide guidelines for a nationwide, government-led encouragement on the provision of total quality healthcare to thalassemia patients in Palestine.

### **1.7 Questions of the Research**

The purpose of this research is to deepen understanding of the basic requirements needed by Thalassemia patients and investigating the level of patient satisfaction of the services provided, then determining the initial requirements of greater importance for patients that require to improve its quality firstly through answering the following questions:

1. What are the causes of critical healthcare problems encountered by patients?
2. How can QFD be applied to understand the expectations of Thalassemia patients, establishing measures of patients' satisfaction and improving healthcare service quality?

### **1.8 Thesis Structure**

This thesis consists of six chapters: Chapter one is an introductory chapter which outlines the nature of the research. It clearly shows a brief description of thalassemia disease and clarifies problem of the research as well as its importance and objectives and presents an overview about quality function deployment technique (QFD).

Chapter two is a review for relevant literature that will be presented in two parts; the first part reveals the variety QFD definitions and terminology, its application different fields and industries. Also, they clarify the main benefits that could be gained through using QFD techniques. The literatures present a model regarding the application of QFD in healthcare sectors and the House of Quality HOQ is also reviewed. The second part offers an overview of Thalassemia disease history and worldwide distribution, complications, treatment and prevention of the disease. Chapter three discusses the main methodology that has been adopted in this research. In particular, it clarifies how to choose the sample, the questionnaire formulation mechanism and the process of data collection will be presented in this chapter. Chapter four gives a comprehensive presentation of data analysis and concluding results, while Chapter five introduces a holistic QFD model and building HOQ diagram. Moreover, it discusses the achieved results and puts the proposed model in practice. Finally, Chapter six summarizes conclusions, recommendations and suggestions for future researches.

**Chapter Two**  
**Literature Review**



## **Chapter Two**

### **Literature Review**

#### **2.1 Chapter Overview**

This chapter presents a review of the literature related to the development of Quality Function Deployment (QFD) in healthcare sector from a TQM perspective. This chapter consists of two parts; the first part presents the basic concepts related to the term “quality” and its meaning from a healthcare service sector perspective in addition to how its evolution into TQM philosophy. It clarifies the main key principles of TQM and its techniques, thus the reader will be able to understand the most important cornerstones that focus on the research. Adding to that, several reviews of the literature are available to reveal the variety of QFD definitions and terminology, its application different fields and industry. Also, they clarify the main benefits and objectives that could be gained through using QFD techniques. The literatures presents a model regarding the application of QFD in healthcare sectors and the House of quality HOQ is also reviewed in order to compare the resulted models, and taking advantage from.

Through this chapter, the reader is directed towards these for a detailed discussion. The second part offers an overview of thalassemia disease and worldwide distribution, complications, treatment management and prevention of the disease.

## **2.2 Part One : General Overview of TQM Philosophy and QFD Concept**

### **2.2.1 Quality Definition**

The definition of quality depends on the people's role of defining it. Many people consider quality as an enigmatic concept; it is perplexing to define and often difficult to measure (Sallis, 2002). Whilst some of them think of quality as some level of superiority or innate excellence; others view it as a lack of manufacturing defects. However, the difficulty in defining quality exists regardless of product, manufacturing and service organizations. Further the meaning of quality has been changed over time (Sanders and Reid, 2012).

Over the years there have been many views and attempts to define the meaning of "quality". In general actually, there is no single universal definition of quality (Sanders and Reid, 2012). The American Society for Quality Control defines quality as "the total features and characteristics of a product or service made or performed according to specification to satisfy customers at the time of purchase and during use" (Talha, 2004).

Several philosophies of "quality" concept have been offered by many Quality gurus that had an enormous influence on evolution of TQM and understanding the quality. Edward Deming defined quality as "a predictable degree of uniformity and dependability with a quality standard that satisfy the customer, at low cost and suited to the market" (Dibler et al., 2005; Chandrupatla, 2009). In the same context, Deming perceived quality as "control of variation" Thus it is noteworthy that "quality is

inversely proportional to variability”, and therefore as the quality increased the variability will be decreased (Montgomery et al., 2011).

Another important definition given by quality guru Crosby, who defined quality as “conformance to requirement”; he developed the phrase “Do it right the first time” and his philosophy oriented towards the notion of “zero defects” and how much the product is matched to the requirements; arguing that no amount of defects should be considered acceptable (Chandrupatla, 2009; Sanders and Reid, 2012). Another common used definition comes from the leader Juran, who defined quality as “fitness for use”. This definition takes into account customer intentions for use of the product, instead of only focusing on technical specifications.

On the other hand, Evans and Lindsay (1998) have pointed out another definition for quality that is based on value for price paid which takes into account in terms of costs and prices; “a quality product is one that provides performance at an acceptable price rather than a name brand, since it provides the same performance at a lower cost”.

Recently, the concept of “quality” has evolved into a more comprehensive new term called a total quality management or TQM.

## **2.2.2 Total Quality Management (TQM) Philosophy**

### **2.2.2.1 Definitions of TQM**

Over the past two decades, TQM has become most widely used. This new buzz word has been well accepted by managers and quality

practitioners as a change quality management approach (Arumugam et al., 2009). The core of TQM approach is the change in management philosophy regarding the "responsibility for quality" and making this responsibility rests with everyone, every employee, from top management to the lowest position in the organization.

Many researchers asserted TQM as an approach to improve effectiveness, flexibility, and competitiveness of a business to meet customers' requirements (Oakland, 1993), as the source of sustainable competitive advantage for business organizations (Terziovski, 2006) and above all as a source of enhancing organizational performance through continuous improvement in organization's activities (Claver-Cortes et al., 2008; Teh, 2009).

According of American Federal Office of Management, TQM is defined as "a total organizational approach for meeting customer needs and expectations that involves all managers and employees in using quantitative methods to improve continuously the organization's processes, products and services" (Morgan and Murgatroyd, 1997). Moreover, according to Asian Institute of Technology (AIT), TQM is "a philosophy that strengthens the culture to foster continuous organizational improvement through systematic, integrated, consistent effort involving everyone and everything, focusing primarily on total satisfaction of internal and external customers, where employees work together in teams with process ownership, guided by a committed top management, which takes a proactive participation" (Nukulchai, 2003).

TQM is a long-term planning and based on continuous improvement, culture change and customer focus. Additionally, Conca et al. (2004) emphasized that TQM allows firms to obtain, on the one hand, a high degree of differentiation, satisfying customers' needs and strengthening brand image, and, on the other, to reduce costs resulting from poor quality by preventing mistakes and wasted time and by making improvements in the corporation's processes and adopting a new management system and corporate culture.

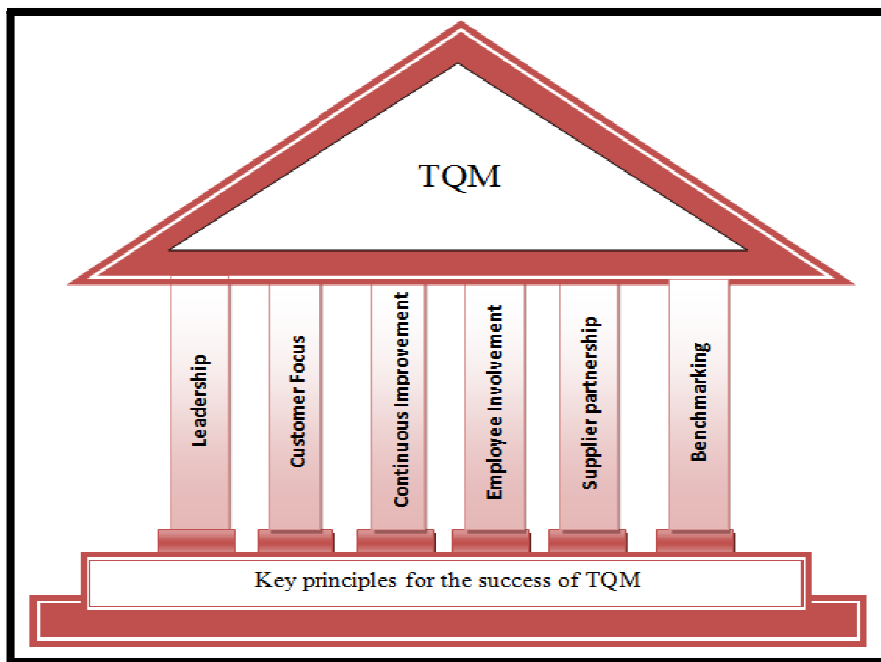
#### **2.2.2.2 Principles and Concepts of TQM**

TQM is a managerial methodology. Therefore, it is a framework of principles as well as a systems approach. Extensive literature reviews of the previous studies on TQM have examined what constitutes TQM and what are the key practices for the success of TQM (Antony et al., 2002; Ooi et al., 2008). The following six key quality improvement concepts that form part of the principles of TQM, as shown in Figure (2.1) will be discussed:

##### **1. Leadership**

Leadership is recognized as one of the important elements of organizational survival. Leadership can be defined as "the ability to inspire confidence and support among those needed to achieve organizational goals" (DuBrin, 1995). Thus, leadership is exemplified by clarity of vision, long-term orientation, coaching management style, participative change, employee empowerment, and planning and implementing organizational

change (Anderson et al., 1994). Furthermore, leadership is the beginning of the quality improvement process. Therefore, Lohavichien et al., (2009) suggested integrating leadership theory and quality management theory would lead to a higher level of quality performance.



**Figure (2.1): The Six Pillars of TQM**

## **2. Customer Focus**

The first, and overriding, feature of TQM is the company's focus on its customers (Sanders and Reid, 2012). Anderson et al., (1994) defined customer satisfaction as "the degree to which a firm's customers continually perceives that their needs are being met by the firm's products and services". On the other hand, the customer should be closely involved in the design and development process, so that there is less likelihood of quality dissatisfaction (Flynn et al., 1994). On the other hand, Read (2010) believes that customer feedback is critical in guiding organizations on the

right path in developing products and improving services. To improve customer focus efforts, customer complaints should therefore be treated with top priority.

### **3. Continuous Improvement**

Continuous improvement is an important principle of TQM for the achievement and keeping of organization competitiveness and which basically distinguishes TQM from other quality philosophies. Boer and Gertsen (2003) defined the continuous improvement, as “the planned, organized and systematic process of ongoing, incremental and company-wide change of existing practices aimed at improving company performance”. Therefore, continuous improvement means searching for never-ending improvements and developing processes to find new or improved methods in the process of converting inputs into useful outputs; it helps in reducing the process variability thereby continuously improving the output performance (Hyland et al., 2000; Sadikoglu and Zehir, 2010).

### **4. Employee Involvement**

Employee involvement is another cornerstone of TQM. Employee participation can be defined as the degree to which employees in a firm engage in various quality management activities. Accordingly, Morgan and Murgatroyd (1997) referred that “total” element of TQM implies that every organizational member is involved in quality improvement processes. It is widely accepted that the increase of employees’ participation in the overall

quality strategy brings an increased flow of information and knowledge, show the benefits of the quality disciplines, obtain a sense of accomplishment and contributes in the "distribution of intelligence" to the bottom of the organization for resolving quality problems (Powell, 1995).

## **5. Supplier partnership**

Developing partnerships with suppliers is one of the major TQM implementation practices (Hackman and Wageman, 1995). Supplier partnership is defined as “the discipline of strategically planning for, and managing, all interactions with third party organizations that supply good and/or services to the organization, in order to maximize the value of those interactions” (Ratesh, 2012). In practice, according to Zakuan et al. (2010), effective supplier partnership is based on a long term commitment that entails creating closer, more collaborative relationships with key suppliers in order to uncover and realize new value, and reduce cost and risk.

## **6. Benchmarking**

Benchmarking is the process of comparing performance information, within the organization as well as outside the organization. It also aims to measure organization’s systems, operations or processes against the best-in-class performers from inside or outside its industry (Sit et al., 2009). It is a way for managers and employees to compare their functional performance to that of others, particularly those excellent and identifying why they may differ. Also, it can be applied to any area of an organization.



The study by Yusuf et al. (2007) highlighted the usefulness of dynamic benchmarking for improving the performance of the organization and to achieve competitive advantage.

### **2.2.2.3 Tools and Techniques of TQM**

Nowadays a huge number of tools and techniques in TQM philosophy have been offered. TQM tools are technical means used to work in the quality programs, and often include diagrams, statistical graphs, also, used to improve processes in any organization by identifying, analyzing and evaluating data that is relevant to their business (Shamsuddin and Masjuki, 2003). Bunney and Dale (1997), states that all techniques have similar importance, but that they are different and applicable in different situations; meanwhile some of tools and techniques are critical for a specific industry only and not applicable for others. On the other hand, each organization may require a different mix of tools and techniques depending on the business, quality of employees, culture and the customer profile.

Based on the literature review; many TQM tools and techniques which in use today for quality improvement are selected by considering the seven basic quality tools, lean manufacturing and designing and management planning tools as shown in Figure (2.2). For thesis purposes, QFD is selected as a main methodology in the development of a total quality healthcare model for the successful implementation of TQM.

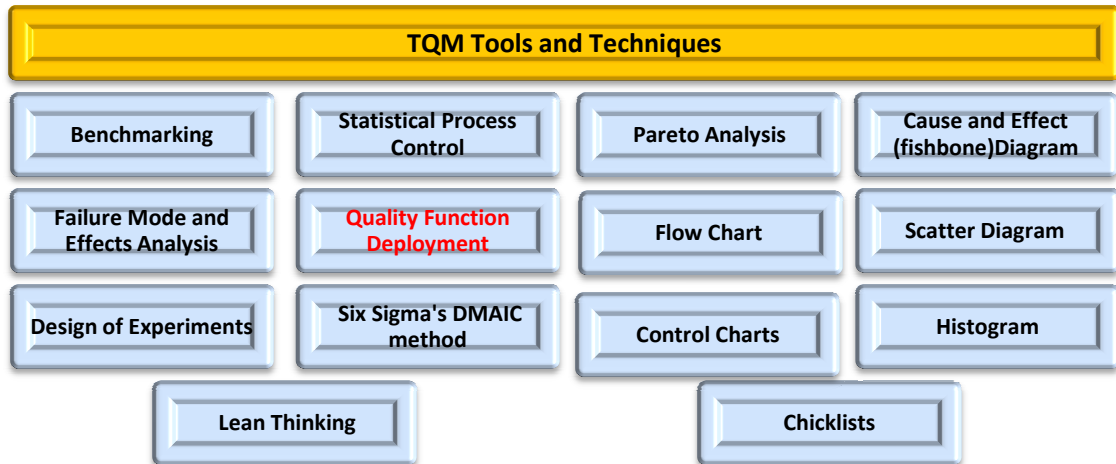


Figure (2.2): Tools and Techniques of TQM

### 2.2.3 Quality in Healthcare Services From a TQM's perspective

Interestingly, service quality has become so important that some organizations, not only need high levels of service quality for success, but in some cases need it for survival. Service quality is defined as “how well the service meets or exceeds the customer’s expectations on a consistent basis”. The difficulty, however is that service quality unlike product quality, is more abstract and elusive, because of features unique to services and therefore difficult to measure:

- (1) *Intangibility*, services cannot be touched, seen or felt before they are bought; however to describe them, customers use words such as “experience”, “trust” or “feeling” (Grönroos, 2000).
- (2) *Inseparability*, service means that production and consumption of the service are inseparable; they occur simultaneously; it cannot be separated from the service provider and both service provider and the customer have impact on outcome (Kotler and Amstrong, 2009).

- (3) *Heterogeneity*, means that service to one customer will not be the “same” service to another one; it differ from provider to provider, from place to place and from customer to customer, and a service provider cannot ensure absolute consistency in the service experience of each customer (Marković, 2006).
- (4) *Perishability*, means that the services cannot be stored or kept for later use; also they cannot be resold or returned and will disappear if not consumed (Ladhari, 2009).

In the recent years, service industries are dominant in developed countries and are among the fastest growing sector even in the emerging countries. One of the fastest growing service industries is healthcare industry; which nowadays is receiving much attention around the world due to impacts the well-being of people. As healthcare has become a critical global issue, the increased concerns for health care quality and patient safety are the primary sources of competitive advantage (Minkman et al., 2007; Dejong, 2009; Lee et al., 2012).

On the other hand, the complexity and the unpredictable nature of healthcare systems and delivery of services make measuring quality difficult. Also, hospitals are multi-customer enterprises; the concept of quality notes different meanings to different stakeholders such as government, service provider, hospital administration and patients; and so must take into consideration the expectations of different categories in their definition of quality (Ferlie et al., 2005). However in general, health service

quality is "giving patients what they want (patient quality) and what they need (professional quality), and doing so using the fewest resources, without error, delays and waste, and within higher-level regulations (management quality)" (Ovretveit, 1992).

According to the Institute of Medicine (IOM) stated a widely-accepted definition of healthcare quality as: "The degree to which healthcare services for individuals and populations increase the likelihood of desired health outcomes and are consistent with current professional knowledge" (Lohr and Schroeder, 1990). Another working definition of quality in healthcare cited by WHO-TIF (2008), which suggests a health system should seek to make improvements in six dimensions of quality which are:

- (1) *Effective*, delivering healthcare that is adherent to an evidence base in improved health outcomes, based on need.
- (2) *Efficient*, delivering healthcare in a manner which maximizes resource use.
- (3) *Accessible*, delivering healthcare that is timely, geographically reasonable, and provided appropriate medical skills and resources.
- (4) *Acceptable/Patient-Centered*, delivering healthcare which takes into account the preferences and aspirations of service users and the cultures of their communities.

- (5) *Equitable*, delivering healthcare which does not vary in quality because of personal characteristics such as gender, race, ethnicity, geographical location, or socioeconomic status.
- (6) *Safe*, delivering healthcare which minimizes risks and harm to service users.

Furthermore, all hospitals provide the same type of service, but they do not provide the same quality of service. A comprehensive approach to measuring the quality of care requires attention to three different kinds of quality problems: too much care (*overuse*) unnecessary or inappropriate care, too little care (*underuse*) of needed care, and (*misuse*) flaws and errors in technical and interpersonal aspects of care (Chassin, et al., 1998).

According to Jackson and Kroenke (1997), healthcare service quality is an indicator aiding the discovering of the aspects of service quality that require changes to improve patient satisfaction. The importance of patients' views as an essential tool for monitoring and managing as well as improving service quality has been stressed by many studies. Research study showed that in addition to its positive implications on patient retention and loyalty, patient satisfaction influences the rate of patient compliance with physician advice and the healing process of patients (Calnan, 1988). Moreover, Pai and Chary (2013) referred to the role that patients play in defining what quality means has become a vital competitive concern. Although some people still feel that patients cannot really be considered good judges of quality; particularly with regard to the technical

competence of the hospital, dismissing their views as too subjective and makes a judgment of a hospital based on the interpersonal aspect of care and the manner in which medical care is delivered; Petersen (1988) challenged this view by suggesting that it is not important whether the patient is right or wrong, what is important is how the patient felt even though the caregiver's perception of reality may be quite different. Furthermore, Peprah (2013) argued that for the limited healthcare resources to be allocated and managed effectively, it is therefore prudent for healthcare providers to assess and identify patients' priorities among various service quality dimensions and to improve these dimensions for patient satisfaction.

Subsequently, many hospitals are shifting the culture of the healthcare system from one formed by the preferences and decisions of medical professionals to one shaped by the views and needs of its users thus adopting a patient-centred attitude (Hendriks et al., 2002). As a result, many of studies employ a wide range of measurements investigating patient satisfaction. Accordingly, one of widely used models to measure service quality is SERVEQUAL- gap model which is developed by Parasuraman et al., (1988) to specifically measure functional service quality using both the gap concept and service quality dimensions. Further, Parasuraman et al., (1985) defined service quality as "the gap between customers' expectations of service and their perception of the service experience". The SERVQUAL instrument has been extensively accepted and utilized as a generic instrument that captures the multidimensionality

of service quality, in its original form, contains twenty-two pairs of Likert scale statements structured around five service quality dimensions. These dimensions as shown in Table 2-1 and Table 2-2 are:

**Table (2-1): SERVQUAL Dimensions**

| <b>Dimension</b>                 | <b>Definition</b>                                                                                      |
|----------------------------------|--------------------------------------------------------------------------------------------------------|
| <b>(1) <i>Tangible</i></b>       | Describes the appearance of physical facilities, personnel and equipment.                              |
| <b>(2) <i>Reliability</i></b>    | Deals with the ability to perform the promised service dependably and accurately.                      |
| <b>(3) <i>Responsiveness</i></b> | Considers the willingness to help customers and provide prompt service.                                |
| <b>(4) <i>Assurance</i></b>      | Talks about the knowledge and courtesy of employees and their ability to inspire trust and confidence. |
| <b>(5) <i>Empathy</i></b>        | Ability to provide caring and individualized attention to customers.                                   |

The SERVQUAL scale is a popular tool in the service industry because of its ease of application and flexibility; and it is extensively used as a conceptual framework for assessing and measuring service quality delivery in healthcare services; whether in the private healthcare (Andaleeb and Millet, 2010) or in the public healthcare (Aagja and Garg, 2010). Also, the SERVQUAL dimensions can be modified to suit some study purposes.

Furthermore, Hart (1996), upheld that the use of SERVQUAL dimensions provides both a structure for designing a service quality measurement instrument and a framework for prioritizing performance improvements that are required or for ensuring that patient' needs and expectations are being met. Further, SERVQUAL measurement provides valuable information about the strengths and weaknesses of the service items (Parasuraman et al., 1994).

**Table (2-2): The SERVQUAL Instrument Presented by Zeithaml *et al.* (1990)**

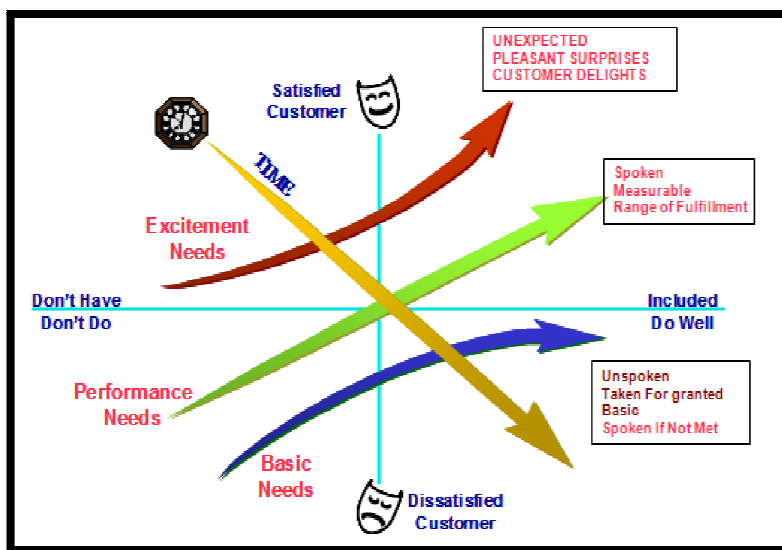
|                       |                                                                                                                                                                                                                                                                                                                                                                                     |
|-----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Tangibility</b>    | <ol style="list-style-type: none"> <li>1. Maintenance of hospital's equipment</li> <li>2. Clean, comfortable and visually attractive environment of the hospital</li> <li>3. Maintenance of high standard of hygiene</li> <li>4. Testy meals as per patients' need</li> <li>5. Accessibility of the hospital (e.g. Parking facility, signage etc.)</li> </ol>                       |
| <b>Reliability</b>    | <ol style="list-style-type: none"> <li>6. Providing services right at the first time</li> <li>7. Providing services at required time</li> <li>8. Sincere effort to solve patients' problems</li> <li>9. Error free documentation</li> <li>10. Doctors' thorough explanation regarding patients' medical condition</li> </ol>                                                        |
| <b>Responsiveness</b> | <ol style="list-style-type: none"> <li>11. Willingness of hospital staff to help patients</li> <li>12. Willingness and interest of doctors and staff to listen to the patients and keep them informed</li> <li>13. Prompt services to patients</li> </ol>                                                                                                                           |
| <b>Assurance</b>      | <ol style="list-style-type: none"> <li>14. Attitude of doctors and staff instilling confidence in patients</li> <li>15. Friendly and courteous behavior of doctors and staff</li> <li>16. Patients' security and safety in receiving medical care</li> <li>17. Patients treated with dignity and respect</li> <li>18. Doctors' wide spectrum of knowledge and competence</li> </ol> |
| <b>Empathy</b>        | <ol style="list-style-type: none"> <li>19. 24 hours service to patients</li> <li>20. Provision for individualized attention for each patient</li> <li>21. Doctors and staff having patients' best interest at heart</li> <li>22. Doctors' understanding of specific need of patients</li> </ol>                                                                                     |

In the same context, customers' expectations sometimes have to be exceeded so that the customer can be delighted. A model of customer satisfaction developed by Dr. Kano as shown in Figure (2.3), categorized quality dimensions into three groups (Kano *et al.*, 1984):



- (1) Must-be (*basic*) needs; that customers would not express them unless the hospital fails to perform them, their absence is very dissatisfying.
- (2) One-dimensional (*expected*) needs; are typically what we get by just asking customers what they want, these needs satisfy or dissatisfy in proportion to their presence in the service.
- (3) Exciting (*unexpected*) needs; that produce great satisfaction.

As customers' needs are dynamic and change with time, some features in services may have been "expected" in the past and but now become "must-be" needs. This implies that the quality of services needs to be continuously improved so as to meet customers expectations.



**Figure (2.3): Kano Model**

It is generally accepted that, healthcare organization is the place where defects and mistakes cannot tolerate. A simple mistake can cost a human life; so defects or mistakes must eliminate in healthcare service processes. Moreover, many previous researches have showed that hospitals

patients experience many types of medical mismanagement though they are paying heavily for their healthcare but are not given due care for what they have spent like: medication error, human error, system error, avoidable injury error, and long waiting times (Ovretveit, 2000). Accordingly, these findings justify the need for a change from traditional approach to adoption modern quality management approaches to healthcare operations.

A variety of quality management practices and models have been developed and applied by medical administrators and researchers in an effort to find better methods for solving quality and patient safety problems; such as: quality control (QC), total quality management (TQM), ISO 9000 standards series, Six Sigma, the Malcolm Baldrige Healthcare Criteria for Performance (MBHCP) Excellence Model, European Foundation for Quality Management (EFQM) Excellence Model and Joint Commission Model of Accreditation (JCA) (Sanguñesa et al. 2007, Nabitz et al. 2009).

TQM particularly is increasingly implemented by different hospitals all over the world to improve healthcare quality. Short and Rahim (1995), defined TQM in healthcare within the context of the key principles of TQM, as a method of leadership and management commitment that: defines quality as customer perceptions as well as the content and delivery of care services; analyzes systems for errors and variation rather than blaming people; develops long-term relationships with suppliers; uses accurate data to analyze processes and measure system improvement; sets up effective collaborative meetings as the basis of teamwork; trains

supervisors and managers in leading the ongoing improvement process; engages staff in setting, risk management. Eventually, TQM has the potential to help the healthcare industry to solve many of the problems they are currently facing.

### **2.2.3.1 Healthcare Quality Improvement in Palestine**

Fragmented structure, uneven distribution of services and human resources between providers characterizes the Palestinian healthcare system. These characteristics are causing low quality and high costs, generating inequities in access, conflicts among providers and patients, disparity of care, and promoting ethical dilemmas (Tilbani, 2005). The “quality defect” in the health care system in Palestine seems to revolve around an inefficient healthcare delivery system. This poses two interesting questions; are the limited resources in Palestine the only cause of poor quality of health care in Palestine? And how much more investment in resources is needed to improve the quality of care? (Al-Adham, 2004). Al-Adham (2004), argued the better quality of health care does not necessarily imply higher health care costs nor does it imply quality irrespective of the cost. The quality of health care in Palestine can be improved with the available resources. There is a need to increase the efficiency of the health care system, and to reduce waste in resources. Cost saving can be obtained from reducing unnecessary care, preventing complications, and eliminating activities that do not add any value to the processes or the outputs of the system.

Accordingly, many endeavors have been invested by MOH together with various studies have established to resolve those issues. Tilbani (2005), reported some of these efforts: the Ministry of Health (MOH) established “The Quality of Healthcare Unit” in 1994 in order to develop plans for the purpose of sustaining and improving the existing healthcare system. From 1996- 2000 the MOH launched the Quality Improvement Project (QIP). The Journey of Quality Improvement in Palestine (1996-2004) has faced many challenges included: the resistance to change and difficulties in tackling the required cultural change. Quality improvement faced resistance from some health personnel, especially physicians, who were not convinced of the quality improvement work and treated this work as an extra burden imposed upon them since they are not satisfied with their jobs and complained of low salaries, lack of resources, and inadequate incentives (Tilbani, 2005).

In addition, there was a lack of monitoring and follow-up systems. Some of the improvement processes collapsed over time. The absence of a supportive managerial system and leadership committed to the principles and methodology of quality improvement made it difficult to change current health institutions and adopt a continuous improvement philosophy. Moreover, there was the challenge to conduct this work in a politically and economically non-conducive environment caused by repeated closures and separation of the West Bank and Gaza governorates. It proved to be an extremely difficult task to function between the different governorates as a unified team under these circumstances. As a complement to this, an

analytical study was conducted by Tilbani (2008), evaluated the experience of implementing the Quality Improvement Program in the Ministry of Health from 2000- 2005 using the theory testing approach and the participant observation. The study showed that the most frequent dimensions or factors that are critical for successful quality improvement implementation are: strategic, cultural, structural, and technical factors.

In addressing TQM implementation, a study conducted by Massoud (1993), reviewed TQM principles, methods of TQM and its possible application in health care system in Palestine (Massoud, 1993). In addition, an analytical study was conducted by Abdellatif (2002), assessed the extent of implementing TQM principles and tools in nongovernmental organizations in West Bank including banks, hospitals, insurance companies, and telecommunications. The study showed that gaps present to a substantial extent in the implementation of TQM principles. To overcome implementation difficulties, the study presented a management model for implementing TQM principles and tools that would lead to the establishment of a new work culture where human resources should be the focus for development.

Finally, a proposed model suggested by Al-Adham (2004), to investigate the possibility of applying quality management approaches into the health care system through the identification of the level of offered services in Nablus hospitals (Public, private and charity) and to search for

possible factors affecting level of offered services. The results showed that total quality management criteria are not considered as hospital priorities.

## **2.2.4 Quality Function Deployment (QFD) Technique**

### **2.2.4.1 QFD Definition and Brief History**

Quality Function Deployment (QFD) was first conceptualized as a method or concept for new product development under the umbrella of Total Quality Control by Mizuno and Akao in Japan in the 1960s (Portal, 2013). Previous quality control approaches had focused on fixing a problem during or after manufacture; however, the goal of QFD is to design customer satisfaction into a product before manufacturing.

In 1966, a large-scale application was first presented by Kiyotaka Oshiumi for Bridgestone Tire Company where it used the fishbone diagram to identify customer requirements (effect) and the quality characteristics (causes) needed to control and measure it (Mazur, 2010). Moreover, this tool was pioneered by Mitsubishi's Kobe shipyard in 1972; where they took the fishbone diagram into a matrix with the rows being desired effects of customer satisfaction and the columns being the controlling and measurable causes. Further, the value engineering principles established by Katsuyoshi Ishihara combined to develop the comprehensive QFD system (Akao and Mazur, 2003; Jnanesh and Hebbar, 2008; Zairi and Youssef, 1995). Thereafter, since the introduction of QFD into America and Europe in the early 1980s, interest in QFD has spread around the world (Akao and Mazur, 2003).

Several definitions of QFD have been offered by many authors in the past several years as the concept has gained popularity. According to Chan and Wu, (2002) QFD is “a structured process, a visual language, and a set of inter-linked engineering and management charts, which uses the seven tools and establishes customer value using the voice of customer”. Another definition developed by Mazur, (1993) who described QFD as “a system and procedures to aid the plan and development of services and assure that they will meet or exceed customer expectation”. He further added that QFD is quite different from traditional quality systems which aim at minimizing negative quality (such as defects, poor services). QFD maximizes positive quality (such as ease of use, fun, luxury) which creates value to customers. Also Akao, (1990) defined it as “a method for developing a design quality aims at satisfying the customer and then translate the customer's demands into design targets and major quality assurance points to be used throughout production stage”. He recognized it as “a philosophy that ensures high product quality at the design phase”.

In addition, Gonzalez et al., (2003) referred that QFD as a “a systematic planning process used by cross-functional teams to identify and resolve the issues involved in providing products, processes, services, and strategies that enhance customer satisfaction”. Also, QFD is referred to as “House of Quality (HOQ)”. The reason for this is that matrixes in QFD fit together to form a house-shaped diagram (Kutucuoglu et al., 2001). Eventually, QFD is a customer-driven process, an established and well-known methodology which translates the “voice of the customer” or

customer needs (the “whats”) into its means of accomplishment within an organization (the “hows”) (Hamilton and Selen, 2004). In other words, the voice of the customer is translated into the voice of the engineer.

#### **2.2.4.2 Benefits of QFD**

QFD is a very powerful tool that plays a significant role in incorporating customer needs into the design standard so the final better product designed to meet customer expectations. A number of published articles discussed benefits of using QFD some of them were in product design others were in service design. These results were gathered, analyzed, and illustrated below (Zairi and Youssef, 1995; Howell, 2000; Bouchereau and Rowlands, 2000; Lim & Tang, 2000; Jaiswal, 2012; Carnevalli and Paulo, 2008):

- QFD helps to significantly reduce startup problems, development time and costs, also the design cycles and changes become shorter.
- QFD improves the communication within the organization by bringing together multifunctional teams from various disciplines, and encouraging teamwork and participation.
- QFD clarifies customer priorities for competitive advantage through increased market share and better exploitation marketing opportunities.
- QFD collects a large amount of verbal necessary data and organizes them in a logical manner.



- QFD focuses proactively on customer requirements in the early design stages. Product planning is much easier to carry out where critical items are identified for parameter design.
- QFD defines product specifications and characteristics that meet customers' requirements and priorities while paying attention to competitors. This leads to greater market share, increased revenue and reduced complaints.
- QFD helps to minimize the mistaken interpretations of priorities and objectives since planning takes place at an earlier stage.
- QFD improves reliability by guaranteeing consistency between the customer's requirements and the measurable specifications of the product, as well as between the planning and the production process.
- QFD informs and convinces all those responsible for various stages of the process about the relationship between the quality of the output at each phase and the quality of the finished product.
- QFD leads to more stable quality planning and increased possibility for breakthrough innovation.
- QFD leads to a satisfied, delighted customer.
- QFD increases the precision of the quality and productivity of service in a continual improvement process that, in turn, helps the company reach world class.

- QFD creates a strong database of customer understanding and internal effectiveness and external competitiveness.

#### **2.2.4.3 Objectives of QFD**

In general, QFD as a quality improvement tool has three major objectives: identify the customer and prioritize spoken and unspoken his/her wants and needs, translate these needs into technical characteristics and specifications, and build and deliver a quality product or service by focusing everybody toward customer satisfaction (Zairi and Youssef, 1995). According to Jaiswal, (2012), some objectives of QFD are listed in the following points:

- ❖ Creates value for customers through improving the approach in which new products are developed;
- ❖ Recognizes the customer and defines customers' needs;
- ❖ Establishes a way to meet customers' requirements;
- ❖ Outlines product specifications that meet the customers' real desires;
- ❖ Includes all information needed to design a product or service, without excluding any point of view;
- ❖ Provides competitive benchmarking support;
- ❖ Maintains consistency between the planning and manufacturing processes of a product;

- ❖ Provides automatic documentation of the project during its evolution;
- ❖ Determines current technical measures that are closely linked to customers' requirements;
- ❖ Identifies current technical measures that are redundant;
- ❖ Defines new customer-related technical measures that are required;
- ❖ Recognizes conflicts among different performance measures;
- ❖ Identifies target values for technical measures;
- ❖ Outlines the difficulty level in accomplishing the target values for specific performance measures;
- ❖ Increases the capability of a company to react. So that any errors that could stem from a faulty interpretation of priorities and objectives are kept to minimum.

#### **2.2.4.4 Problems and Limitations of QFD**

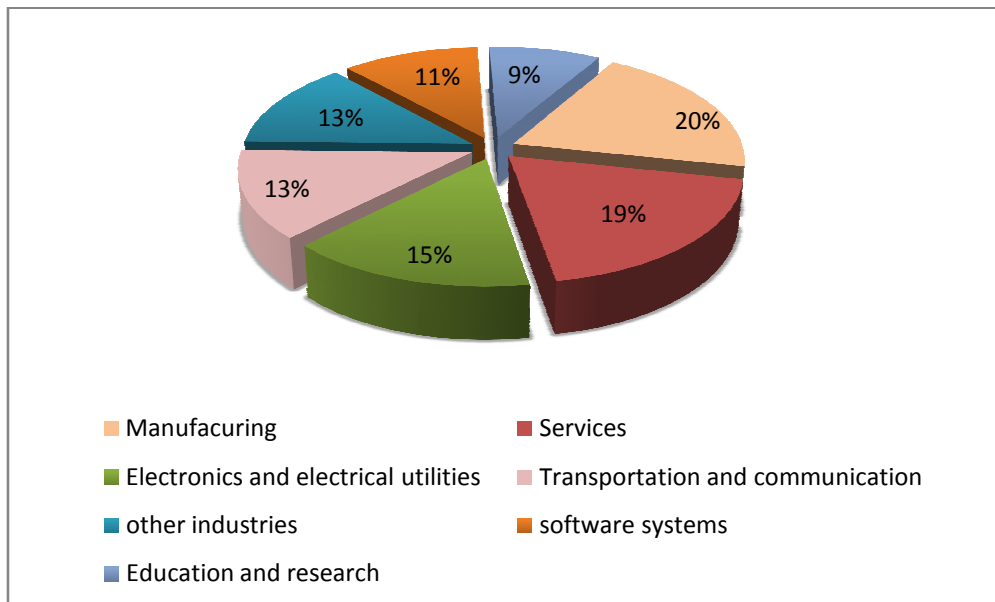
Unfortunately, as with any technique, there are limitations with QFD. While QFD appears to be central to quality improvement programs and has numerous applications; nevertheless, there have been some problems associated with its implementation (Zairi and Youssef, 1995; Jaiswal, 2012; Chan & Wu, 2002; Carnevalli and Miguel, 2008):

- Because QFD deals with huge amount of data, it can become unmanageably large and complex. This can result in higher data storage, manipulation, and maintenance costs.

- QFD is mainly a qualitative method, especially when it comes to interpreting the customers' voice since it is usually subjective, multiplicity of meaning and ambiguous in nature.
- A QFD process can take long time to develop; it is difficult and time consuming to input and translate large amounts of customer needs into measurable product characteristics.
- The relationship between customer requirements and technical measures is sometimes difficult to determine.
- Since QFD is an ongoing process, an error in one phase can spread to successive phases.
- Some QFD practitioners limit their use of QFD to the first phase only.
- While the degree of the relationship in QFD is imprecise; based on expert opinion, the values used to determine the strength of relationships are absolute, implying that accurate and representative data are available.
- QFD process may be a cumbersome procedure, demanding excessive involvement from various functional units and also it relies heavily on data obtained from the customers through market research that can change quickly nowadays; thus it requires making adapting to changed market needs more complex.
- Target values setting are often vague.

### 2.2.4.5 Applications of the QFD model

Many industries use QFD as tool of improvement but with different distribution and percentage of usage. According to Chan and Wu (2002), who classified applied industries of QFD as follows: transportation and communication, electronics and electrical utilities, software systems, services, education and research. Figure (2.4) presents the distribution of these resources and it shows that resources on manufacturing and services have the majority of using QFD.



**Figure (2.4): Percentage of Publications of Applied Industries of QFD (Chan and Wu, 2002)**

The Concept of QFD was expanded and became one of the most important advanced quality techniques used by organizations that are far advanced in the quest for world-class quality or international competitiveness (Maddux et al., 1991). The first reported success story was the "Toyota rust study" in which observed how Toyota was able to eliminate warranty costs due to rust and reduce start up pre-production

costs by 60% in the late 1970's and to decrease the time required for its development by one-third through the use of QFD (Hauser and Clausing, 1988; Hsiao, 2002).

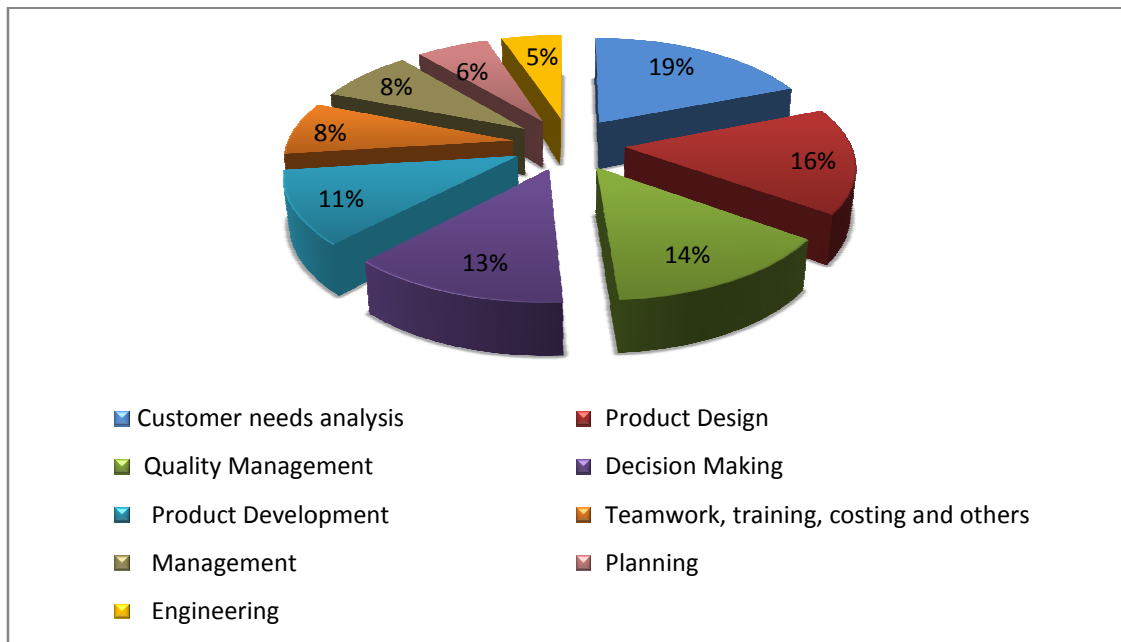
Additionally, while the Shipbuilding and electronic industries were the first two areas in which QFD were applied; currently the fast development of QFD has resulted in its applications to include many major automobile companies such as: General Motors and Ford Motor Co. and manufacturing companies such as: Hewlett-Packard, Procter and Gamble, 3M Corporation, AT&T, Digital Equipment Corporation, etc. (Cohen, 1995); where QFD applied to produce new products with lower costs, improved quality and reduce lead-times and engineering changes.

In spite of the concept of QFD has been adopted by manufacturing companies for product development purposes, but it has been expanded more to be applied in non-manufacturing environments such as airlines, hotels, and utilities (Ansari and Modarress, 1994). Recently QFD became applied in the service sector, such as government, banking and accounting, healthcare, education and research, environmental initiatives, construction, and many other applications. (Al-Aomar and Al-Meer, 2012). Now it is hardly to find an industry to which QFD has not yet been applied.

Furthermore, the application of QFD in the service design is much more complex than the application of it in product design because the service is considered as an intangible product and therefore requires highly

qualified professionals to translate needs and requirements from environment to the organization (Dijkstra and Bij, 2002).

There is no definite boundary for QFD's potential fields of applications. The distribution of some of existing resources is presented according to Chan and Wu (2002), in Figure (2.5). As it is shown, customer needs analysis, takes the most participation, comparing with other fundamental fields of QFD. This is due to the importance of customers' needs in the first HOQ in the QFD methodology.



**Figure (2.5): Percentage of Publications in Functional Fields of QFD (Chan and Wu, 2002)**

On the other hand, Zairi and Youssef (1995) also have commented on the relationship between QFD and TQM. They stated that QFD is a prerequisite for successful implementation of any TQM program. This is because QFD is central to the three core principles of TQM, namely, customer focus, involvement and teamwork, and continuous improvement.

Also, according to Howell, (2000) perspective, it should be borne in mind that QFD, and any other quality tool or technique, should not be normally be used in isolation, but should be an integral part of continuous improvement process.

In consequence, QFD has been used in combination with SERVQUAL and with Kano's model as part of an integrated employment of methods. Integrating SERVQUAL and the Kano model into QFD can provide insight in solving many problems. As introduced above, QFD serves as a tool for translating the customer requirements (voice of customer) into organization requirements. Therefore, it can provide guidance for improving the service quality of poorly performing attributes identified by using SERVQUAL and the Kano model (Tan and Pawitra, 2001). Various studies exist regarding the combination of SERVQUAL and QFD, or the Kano model and QFD. Lim et al. (1999) adopted the approach of integrating SERVQUAL and QFD in the healthcare sector in Singapore for measuring performance and designing services. Similarly, Ikiz and Masoudi, (2008) applied the same integrating approach of integrating SERVQUAL and QFD in hotel service design. Moreover, Tan and Shen, (2000) applied the approach of integrating Kano model and QFD in website design.

#### **2.2.4.6 QFD Models in Healthcare Industry**

Some of QFD models were implemented and applied in the field of healthcare industry which is a very important and complicated service.



These Models were summarized in order to compare between results and figure out the different approaches.

Lim and Tang, (2000a) represented a case study of a restricted regional care acute hospital in Singapore, surveys were analyzed, the most important customer requirements were patients treated with dignity and respect, service provided at appointed time, clean and comfortable environment with good directional signs and informative brochures about services also doctors understand patient's specific needs. These requirements were translated to management activities and when HOQ was analyzed the most activities that need improvement were appointment system, quick registration, feedback system, computerized on-line information system and doctor-to-bed ratio. In addition, a degree of attentiveness, knowledge of staff and service response speed need an enhancement.

Another model was conducted in Singapore but had a little bit different results. Lim et al., (1999) applied a QFD and HOQ model in a hospital in Singapore. From the survey conducted on patient's expectations of hospital service quality, and the highest expectations were over all explanation of medical condition, staff should be professional, competent and responsive, also patients should be treated with dignity and respect. These expectations were translated to technical requirements some of them were survey of patients, advance medical research, patient education, quality orientation of new staff.

Furthermore, Ehrlich and Kratochwill, (1994) showed the Medical Procedures Unit employed QFD at the University of Michigan Medical Center, to design a single portal of entry to help alleviate the anxiety and frustration patients and referral sources might feel when attempting to gain access to the medical centre. In addition, Radharamanan and Gody, (1996) pointed that using QFD in UHSM (University Hospital in Santa' Maria) ought to understand better and evaluate the requirement of the community in order to include them in continuous improvement, and also to exceed requirements and expectations of its external (patients) and internal (employees).

Although, Muzur et al., (1995) presented a case study of a medical foot clinic in Princeton Baptist Medical centers physical therapy department not hospital, the results were not far away from results in hospitals. Repacking the service provides an opportunity to design in quality using QFD & HOQ. Quality items related to timeliness, convenience, courtesy and unspoken items such as flexibility in the referral process and explanation of procedures were the most demanded quality items. There was just one model, which discussed the discharging process. In this model, Chung and Cheng, (2003) mentioned that their research adopts QFD and HOQ in order to establish the continuing care system of discharge planning. In addition, in order to search for needs of patients family and long-term care facilities. Findings of the research noted that patient's families and long-term facilities should be provided by professional service, in addition to this the education of the patient family

must be strengthened by providing suitable courses about discharging plan and by getting more information about the hospital. Camgöz-Akdağ et al., (2013) described how QFD methodology was employed for translating customer needs into the quality characteristics in a privately-held university hospital, within the city of Istanbul in Turkey; and they have experienced the integrated usage of SERVQUAL with QFD & HOQ methods that gives a systematic and efficient approach in translating customer needs.

Adding to that, Mohiuddin et al., (2006) used QFD in their research to focus on identification and prioritisation of users' requirements in the context of developing quality healthcare software system for Sultan Qaboos University Hospital (SQUH) in Oman. a list consisting of 30 technical requirements was generated and this list has been prioritised using Analytic Hierarchy Process (AHP) tool in order to receive higher weights that should be paid due to consideration at the time of designing the healthcare software system for SQUH.

Moreover, ZHU, (2013) presented in his study which aims to evaluate the facilities management service quality in Singapore's hospitals from the patient's perspective as well as providing effective ways to improve it and achieve patient satisfaction; through combining service quality and attractive quality theory; he integrated 3 instruments: SERVQUAL, Kano and QFD in the surveys. The model survey findings results in the ranking list of the 32 solutions for continuous improvement, which can serve as a reference list when priorities need to be given to them for corrective actions.

Finally, Lim and Tang, (2000b) summarized the benefits of using QFD to the hospitals. They developed a management model using QFD applied in a hospital in Singapore, which helped the health sector to build up strategies through the partnership between healthcare managers and clinicians, in order to provide a total quality health care, in the context of changes in healthcare industry.

#### **2.2.4.7 The QFD Process and House of Quality (HOQ)**

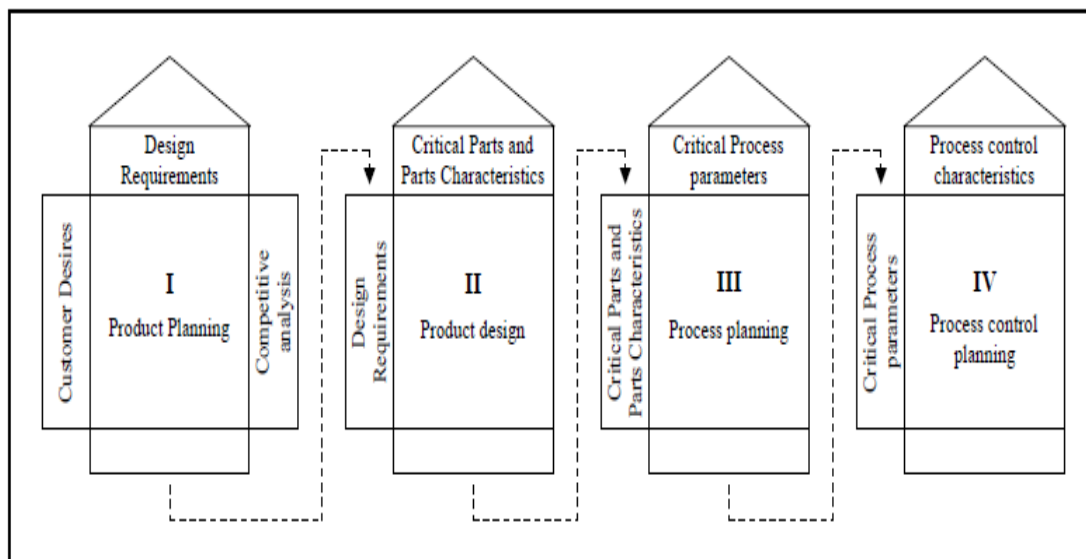
QFD is a process for capturing and translating customer requirements into company requirements at each stage (Jikar et al. 2007). The most-used QFD methodology beyond the HOQ is the conventional manufacturing-based QFD, which is broken down into four phases that are documented as matrices (Cohen, 1995). Each phase or matrix represents a more specific aspect of the product's requirements. Each matrix consists of a vertical column called "WHATs" and a horizontal row called "HOWs." "WHATs" are customer requirements (CR); "HOWs" are ways of achieving them or the technical attributes (TR). At each stage, only the most important aspects from "HOWs" are deployed into the next phase as "newWHATs" (Shahin, 2005).

The first phase is called house of quality (HOQ). Each phase can be treated as an HOQ. These four phases are extended throughout the entire system's development life cycle. Nevertheless, huge amounts of organization focus on HOQ only (Hauser and Clausing, 1988). This is due to the lack of detail on how to develop the subsequent QFD phases.

Furthermore, the three phases of QFD have almost the same structures and analyzing methods of the HOQ phase (Chan and Wu, 2002).

The four phases as shown in Figure (2.6) are:

- Phase I: Product planning (HOQ)
- Phase II: Design deployment (part deployment)
- Phase III: Manufacturing planning (process planning)
- Phase IV: Production planning (production operations planning)



**Figure (2.6): The Four-Phase of Traditional QFD Model (Cohen, 1995)**

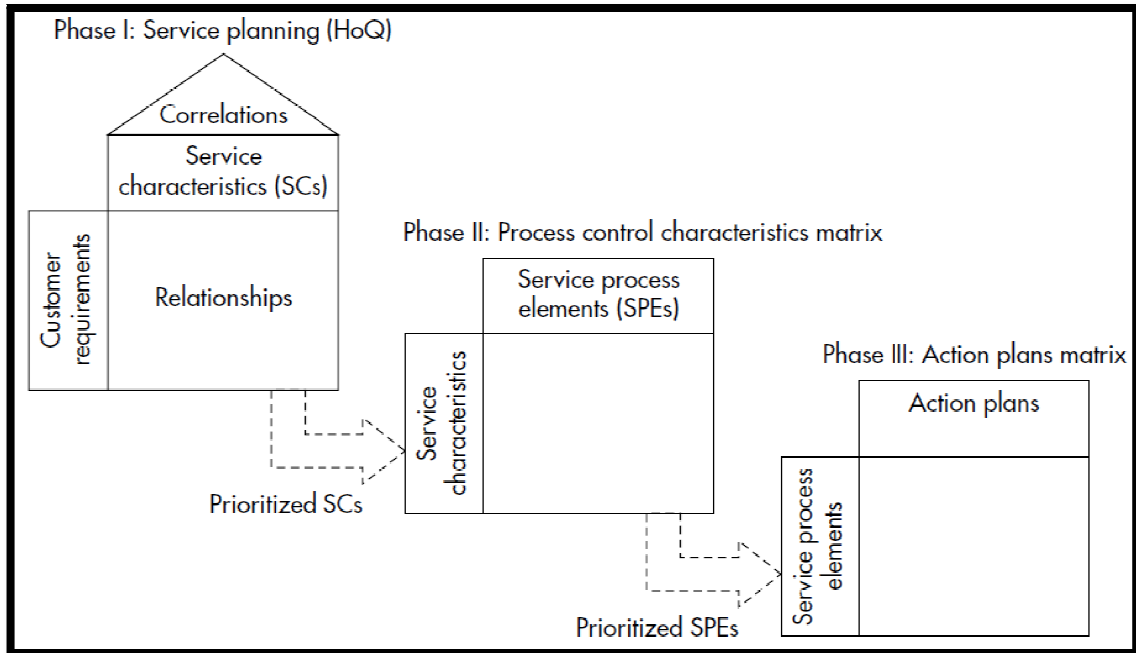
In the domain of services, due to the inherent characteristics of services as discussed; the traditional four-phased manufacturing QFD methodology needs to be modified slightly; so that it can be applied to the service industry, and therefore involves three-phase action plan based methodology instead of four (Kioumars et al., 2010; Marvin et al., 2004).

According to Kioumars et al., (2010), a three-phase action plan based QFD flow down process was developed for use in the hospitality industry as shown in Figure (2.7). The three phases include:

***Phase I: Service planning (HOQ):*** The overall process of QFD is based on its core matrix framework, called the HOQ; which is used to intertwine customer needs, service design requirements, target design goals, and competitive product/service evaluations. The structure and components of these matrices will be described in the following section. The prioritized service characteristics then are transformed to the next phase.

***Phase II: Process control characteristics matrix:*** This phase links the service characteristics identified in Phase I to the service process elements that will satisfy the customer requirements. In this phase, the measurable characteristics will be defined for each service characteristic and prioritized from the HOQ to develop the process control characteristics matrix.

***Phase III: Action plans matrix:*** This phase links the service process elements to the service quality control parameters that need to be monitored to ensure customer satisfaction. An action plan is developed for each of the critical process characteristics that are identified in Phase II. All action plans will be measurable to allow maintaining control of critical service characteristics and consequently attaining customer satisfaction goals (that is, target values).



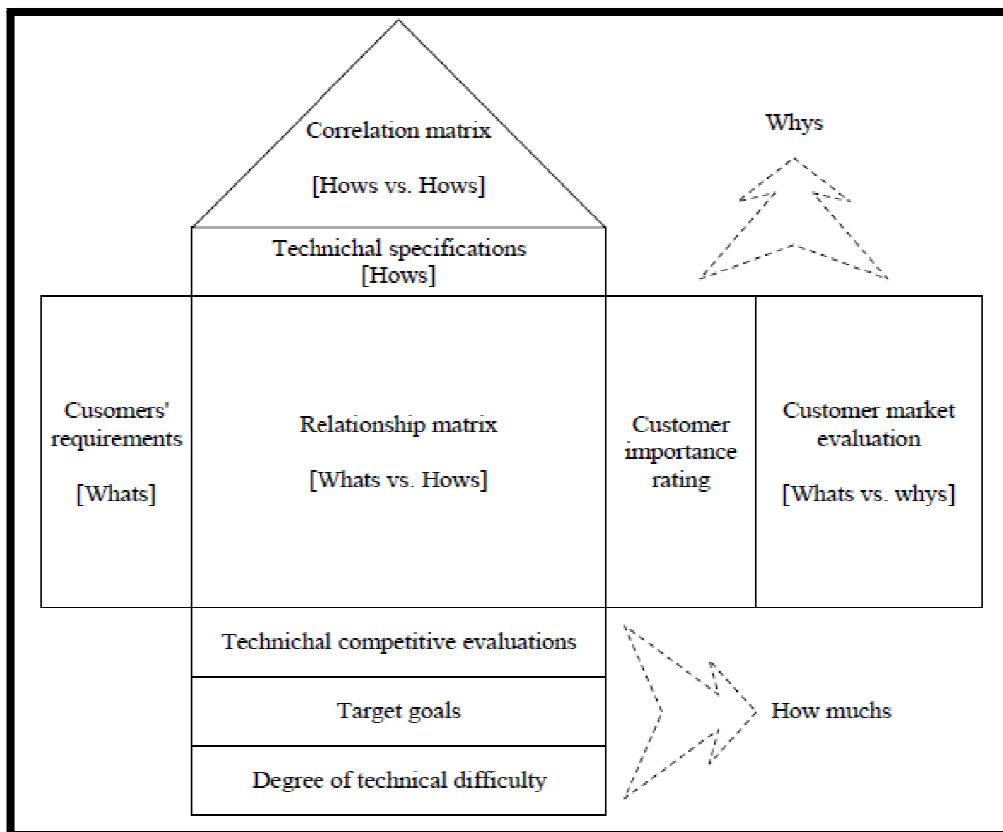
**Figure (2.7): A three-phase action plan based QFD flowdown process in the hospitality industry (Kioumars et al., 2010)**

### ***“House of Quality” (HOQ)***

The House of Quality (HOQ) is the most recognized and widely used matrix; the name comes from its house shape due to a roof-like structure in its top. HOQ is the basic design tool of QFD. It translates customer qualitative needs based on marketing research and benchmarking data, into quantitative measurable technical requirements using a planning matrix. This is beneficial to the engineers, as they can trace each requirement back to its source. Consequently, the engineers and developers guarantee that they have effectively translated the voice of the customer (Chan & Wu, 2002). Basically, it is the nerve center and the engine that drives the entire QFD process. According to Hauser and Clausing (1988), it is “a kind of conceptual map that provides the means for interfunctional planning and communication.” The House of Quality matrix consists of six main elements:

- A. Customer requirements CR/VOC (WHATs).
- B. Planning matrix.
- C. Technical requirement TR/VOE (HOWs).
- D. Relationship matrix between WHATs and HOWs.
- E. Technical correlation matrix.
- F. Technical matrix.

As a result, the House of Quality can be built in many shapes and forms. The general purpose of QFD model includes the components addressed (Menks et al, 2000) in Figure (2.8):



**Figure (2.8): House of Quality (HOQ) in QFD (Menks et al, 2000)**



***Customers requirements (CR)*** - Also known as "Voice of Customer" or VoC, they are the "whats" the customers want from the product/service to be developed. They contain customers' wishes, expectations and requirements for the product/service.

***Customer importance ratings*** - Once these "whats" are in place, the customer needs to provide numerical ratings to these "whats" items in terms of their importance to the customer. A numerical rating of 1 to 5 is often used, in which the number 5 represents the most important and 1 the least.

***Customer market competitive evaluations*** - In this block, a comparison is made between a company's product/service and similar competitive products/services on the market by the customer. The comparison results will help the developer position the product on the market as well as find out how the customer is satisfied now. For each product, the customer gives 1 to 5 ratings against each CR, 5 being best satisfied and 1 the worst.

***Technical requirements (TR)*** - They are the technical specifications that are to be built into a product with the intention to satisfy the CR. They are sometimes referred as "hows" because they are the answers to CR: how can the requirements be addressed or satisfied. They are the engineers' understanding in technical terms what customers really want. The technical specifications must be quantifiable or measurable so that they can be used for design.

**Relationship matrix** - Relationship matrix is used to maintain the relationship between CR and design requirements. In other words, the matrix corresponds to the "whats" vs. "hows". It is the center part of HOQ and must be completed by technical team. A weight of 1-3-9 or 1-3-5 is often used for internal representation of relationship, 1 being the weak and the biggest number being the strong relationship.

**Correlation matrix** - It is the triangular part in the HOQ (the "roof"). The correlation matrix is used to identify which "hows" items support one another and which are in conflict. Positive correlation help identify "hows" items that are closely related and avoid duplication of efforts. Negative correlation represents conditions that will probably require trade-offs. The positive and negative ratings are usually quantified using 2, 1, -1, and -2 ratings, with 2 being the two "hows" items are strongly supportive to each other and -2 being the conflicting. Sometimes only 1 and -1 are used.

**Target goals** - Completed by technical team, these are the "how muchs" of the technical "hows" items. They provide designers with specific technical guidance for what have to be achieved as well as objectively measuring the progress. The goals have to be quantified in order to be specific and measurable.

**Technical difficulty assessment** - Technical team conducts the assessment. It helps to establish the feasibility and realizability of each "hows" item. A 1 to 5 ratings are used to quantify technical difficulty with 5 being the most difficult and 1 being the easiest.

***Technical competitive evaluation*** - It is used for comparing the new product with competitor's products to find out if these technical requirements are better or worse than competitors. Again, 1 to 5 ratings are used with 5 being the fully realized each particular "hows" item and 1 being the worst realized.

***Overall importance ratings*** - This is the final step of finishing HOQ for phase 1. For each column, sum all the row numbers each of which is equal to the production of relationship rating and customer's important rating. The results help identify critical product requirements and assist in the trade-off decision making process.

## **2.3 Part Two: Overview of Thalassemia Disease and Worldwide Distribution**

### **2.3.1 What is Thalassemia**

Thalassemia is an inherited condition affecting the blood that originated in the Mediterranean region; it is a heterogeneous group of genetic autosomal recessive disorders characterized by reduced or absent amounts of hemoglobin (Peters et al, 2012). In addition, these conditions cause varying degrees of anemia, which can range from insignificant to life threatening.

The cause of disease is a genetic change, involving the genes of hemoglobin which is made out of different parts. The main parts which are put together to make the hemoglobin molecule are called alpha chains and

beta chains (Colin, 2015). In thalassaemia, part of the hemoglobin is faulty, which usually could be either mutation or deletion, results in reduced rate of synthesis or no synthesis of one of the either the alpha chains or the beta chains that make up hemoglobin. This means that some of the hemoglobin does not work properly (Rund and Rachmilewitz, 2005; Lahiry et al., 2008). As a result, there is not enough normal hemoglobin and this can cause the formation of abnormal hemoglobin molecules and the red blood cells break down easily. Meanwhile, the body tries to make more hemoglobin and more red blood cells. So, the blood system goes into overproduction mode which can cause more symptoms and complications (Colin, 2015).

### **2.3.2 Types of Thalassemia**

Depending on the location of genetic mutation in protein chains composed of hemoglobin; Thalassemia is divided into two main types (Farlex, 2012; Abdullatif, 2015):

- A. Alpha  $\alpha$ -thalassemia: It is the result of a defect in the genes for the alpha globin component of hemoglobin.
- B. Beta  $\beta$ -thalassemia: It is caused by a defect in the gene for the beta globin component of hemoglobin. It is the most common and best-known type of thalassemia and is also called Cooley's anemia.

Each type of thalassaemia (alpha and beta) can be classified into more types. This mainly depends on how many thalassaemia genes are

involved and the severity of their symptoms; also other individual factors involved. Whereby thalassemia may cause no illness at all, or may be a serious lifelong condition requiring treatment. Further, the severity associated with thalassemia can vary widely from person to person, or the severity may change over time (Colin, 2015). According to that, there are three groups categorized according to severity of thalassemia (Sayani et al., 2009; Thalassemia DC, 2014; Abdullatif, 2015):

- 1) Thalassemia Minor (Trait): This can also be called (carrier state), meaning that the person carries the genetic characteristics and not suffering from any symptoms; there is no need for treatment and most people who have inherited this are not sick and probably do not know they have it. The thalassemia trait individuals are normal healthy people and usually practice normal active life.
- 2) Thalassemia Intermediate: Is a condition intermediate between the major and minor forms. Caused by the reduced availability of hemoglobin level and can lead to moderate to severe anemia. Affected individuals can often manage a normal life but they should be monitored and may need occasional transfusions.
- 3) Thalassemia Major: Caused by the unavailability of hemoglobin level resulting from breakdown of abnormal red blood cells, leading to a very severe and fatal if left untreated anemia. Affected individuals with thalassemia major suffer by a severe anemia with long-time transfusion dependent likewise they are at risk for impaired growth and development, heart failure and eventual premature death.

### 2.3.3 Complications of Thalassemia

The most common complications occur over time include (Colin, 2015; HealthWatch, 2015; Mayo Clinic, 2015; Nordqvist, 2014):

- Iron overload

As needed, the frequent blood transfusions are considered as a standard treatment for thalassemia. In consequence, these transfusions or the disease itself can cause freeing large amounts of iron to build up in the blood and accumulate in body organs too. Therefore, excessive iron can damage organs and tissues, especially the spleen, heart and liver. Also, iron overload can affect the endocrine system which may lead to delayed puberty and restricted growth. Later the patient may be at a higher risk of developing diabetes.

- Enlarged spleen

The spleen recycles red blood cells (RBC). In patients with thalassemia, the abnormal shape of RBC may make it harder for the spleen to recycle them so these cells accumulate in the spleen and causing to enlarge. An enlarged spleen can become overactive - it starts destroying healthy blood cells received during transfusions.

- Infection

Among people who have thalassemia, infections are a key cause of illness and the second most common cause of death. People who have had

their spleens removed are at even higher risk because they no longer have this infection-fighting organ. In addition, transfusions can cause blood reactions as well as infections such as hepatitis B and C.

- Osteoporosis

Many thalassemia patients have bone problems; this is because the body tries to produce more RBC; this is a natural reaction to anemia. However, it does not much help because most of the hemoglobin that is produced is abnormal. The result is over-expansion of the bone marrow; which is the body's blood cell factory. As a result, this affects bone growth, including the face and jaw bones, making the forehead and upper jaw very prominent. As the bone marrow expands, the bones deform and become weak, brittle and break.

#### **2.3.4 Treatment protocol and Management of Thalassemia**

Treatments for thalassemia depend on the type and severity of the disorder. Carriers no need for any treatment. Nowadays, treatment for thalassemia has dramatically improved. Over the last three decades, clinical observations, studies and research have established that thalassaemia major is a treatable condition (Eleftheriou, 2003). Thalassaemia care has achieved survival of patients by adopting good blood transfusion and chelation practices and also by adopting follow up protocols which aim to detect early and prevent if possible complications to vital organs (Cappellini, et al., 2014). The standards of care guidelines are:

**a. Blood Transfusion Support:**

According to (Vichinsky and Neufeld, 2010; Forget, et al., 2010), blood transfusion is the mainstay of care and lifesaving treatment for individuals with thalassemia major and many with intermedia. The purpose of transfusion is twofold: to improve the anemia and to compensate for the decrease in hemoglobin level and give healthy RBCs to maintain hemoglobin (Hb) level higher than 9.5 gm/dl. Moreover, thalassemia major patients need regular packed red blood cell transfusions every three to four weeks, the decision to start regular transfusions is clear when the initial Hb level is well below 7 gm/dl. Accordingly, frequent transfusions allow for more normal growth and development and prevent most of the serious complications of thalassemia major. Besides that, they are important for improved quality of life, and increased life expectancy (Sayani et al., 2009). However, once started, the transfusion-related complications become a major source of morbidity. Therefore, standards must be developed and maintained to ensure a safe and rational approach to the use of blood transfusions. To do so, transfusions should be administered in a designated clinical area by staff experienced with transfusion policies (Vichinsky and Neufeld, 2010; Forget, et al., 2010).

**b. Iron Overload and Chelation Therapy:**

Eventually, the body is not able to get rid of the excess iron itself (Farlex, 2012). Therefore, the primary treatment for iron overload in thalassemia is a daily chelation therapy which controls the level of iron



deposition in the body that results from repeated blood transfusion and maintains a ferritin (iron level) between 1000-1500 ng/mL (Yarumian, 2005) . To achieve this objective, two medicines are used for iron chelation therapy:

- DESFERAL (desferrioxamine) infusion- is a liquid medicine that's given slowly under the skin. This therapy takes time and can be mildly painful and very inconvenient due to the need of a special small battery-operated pump used overnight and long daily infusion time (about 10-12 hours) that limits patients other activities and skin problems as a consequence of daily injection, so some people stop chelation therapy (NHLBI, 2012).
- EXJADE (deferasirox) - is a more convenient chelation medicine was developed and the new drug, has significantly higher half life and manufactured as tablets can be taken by mouth once daily. Eventually, EXJADE became the ultimate choice for treatment of thalassemia patients worldwide due to the several advantages it presents the significant improvement of patients' compliance (Vichinsky and Neufeld, 2010).

The effectiveness of chelation should be routinely monitored and appropriate dose and drug adjustments made when required. In addition, patients and families should receive appropriate education and access to an experienced multidisciplinary team to provide support in the practical aspects of chelation therapy (Sayani et al., 2009).

- c. **Surgical operations:** Splenectomy, Cholecystectomy (surgical removal of the gall bladder) or any other surgical operation (Shahin, 2014).
- d. **Folic acid supplements:** is a B vitamin that helps build healthy red blood cells (NSGMED, 2014).
- e. **Bone marrow transplant:** also called a stem cell transplant replaces faulty stem cells with healthy ones from another person (a donor). A stem cell transplant is the only treatment that can cure thalassemia. But only a small number of people who have severe thalassemias are able to find a good donor matching and have the risky procedure (HealthWatch, 2015).
- f. **Gene therapy:** is also an option still researched (Abdullatif, 2015).

For optimal treatment of thalassemic patients, all patients should be managed in a specialty program and undergo at least an annual comprehensive assessment and a periodic monitoring of the blood ferritin level to assess iron level and vital organs functions (liver, heart, hermons, bones... etc) every 3 to 6 months to control complications, stop deteriorations of these organs, to provide the needed medication and referring who is in need to other specialties. Therefore, an established network of care between thalassemia centers, local providers, and patients is required and each component of this network should follow the standards of care guidelines and communicate frequently. This must have close collaboration with the blood bank and other laboratory services and

coordinates a multi-disciplinary team of specialists working closely together for holistic care and prevention of complications (Sayani et al, 2009; Cappellini et al., 2008).

### ***Cost of treatment***

Basic thalassemia treatment costs between 10-15 thousand dollars every year for each patient without bone-marrow transplantation and without new treatment (Exjade). With new treatment (Exjade) each patient costs around 45-50 Thousand US/ year. (Exjade) can be considerably more expensive depending on the dose; it costs \$750 per box (28 tablets) with doses altered proportionately according to patient weight. Also, bone-marrow transplantation is very costly; bone marrow costs around more one than 100,000 US dollars without follow up (Salman, 2015; Shahin, 2014). Besides that, the moral losses due to the absence of the work or school. Consequently, when patients are well monitored and treatment is given systematically, fewer complications will result and therefore the medical cost is kept to the minimum. The cost to treat the serious complications of thalassemia by the health system is 10 times the cost of giving patients their daily needs and proper follow-up (TPFS, 2013a).

### ***Prevention and control of Thalassemia***

Ultimately, thalassaemia is a preventable disease and the only way to prevent thalassemia is avoiding new births affected of thalassemia through premarital screening and counseling. It is advisable that all prospective

couples who wish to get married should be screened for the detection of thalassemia trait. On the other hand, reduce the phenomenon of intermarriage between relatives. Besides that, provision of counseling and health education for the thalasseemics, their families and the public. Furthermore, provision of prenatal testing for thalassemia done during pregnancy (Abdullatif, 2015; ETS, 2013).

### **2.3.5 Psychological and Social Effects of Thalassemia**

The treatment of thalassemia poses a very severe burden for patients and their families; because it requires constant review and frequent admission to hospital which includes frequent tests, also suffering during periodic blood transfusion and daily iron chelation (Saini et al., 2007).

Thalassemia is a disease that, if allowed, can control your life. Thalassemia and its complications particularly cause major social and financial burdens on patients, families and healthcare system (Prasomsuk et al., 2007), also have a significant psychological impact, causing an emotional burden, hopelessness, frustration, disappointment and difficulty with social integration (Economou et al, 2006). Patients with thalassemia feel different from their peers and develop negative thoughts about their life, a sense of guilt, lack of confidence and low self-esteem (Saini et al., 2007). Furthermore, feelings of being unloved, isolation, anger, fear of death and helplessness due to inability to practice different activities and delay in academic achievement and the difficulty in obtaining suitable work or a family (Yahia et al., 2013; TIF, 2016).

Within the family, Thalassemia in some cases can cause to the disintegration of the family because of guilt, each parent blames another that is causing disease, which may lead to divorce cases. Furthermore, economic problems especially, if financial income for parents medium or weak, especially places where not free treatment exists (Prasomsuk et al., 2007; TIF, 2016). The sad part of the story, however, is seen in affected countries with limited resources where patients in these countries die at very young ages, often undiagnosed or misdiagnosed, and inappropriately treated or not treated at all (TIF, 2016).

### **2.3.6 Thalassemia in the world**

The term “Thalassemia” is derived from the Greek word “THALASSA” which means the sea; “HEMIA” means blood “in reference to anemia of the sea (Galanello and Origa, 2010). Thalassaemia was originally thought to be a disease limited to the Mediterranean region, in countries such as Greece, Italy and Cyprus. Therefore, the name given to the disease: “Mediterranean Anaemia or thalassaemia” (Weatherall, 2010). However, this is incorrect because the population migration and intermarriage between different ethnic groups has not left any regions untouched with thalassemia and introduced it in almost every country of the world, including Northern Europe where thalassaemia was previously absent (Cappellini et al., 2014; Christopher et al., 2013).

Thalassemia disease is widespread throughout the world; it has mostly dominated the region known as “the thalassemia belt” ranging from

North West Africa and Mediterranean region to South East Asia (Christopher et al., 2013). It is more prevalent in the Mediterranean basin, the Middle East, Southern and Eastern Asia, the Indian Sub-continent, the South Pacific and South China, with reported carrier rates ranging from 2% to 25% (Cappellini al., 2008).

Based on the report of the World Bank, recent statistics indicate that approximately 7% of the global population are carriers of blood disorders, and that 300,000 to 500,000 children are born annually with a severe haemoglobin disorder (WHO, 2006). On the other hand,  $\beta$ -thalassemia is highly prevalent, with 80 to 90 million people reported to be carriers across the world (1.5% of the global population) of which approximately 60,000-70,000 annual new birth cases of thalassaemia in the world (Colah et al., 2010; Higgs al., 2012; Abolghasemi et al., 2007).

The highest carrier frequency of  $\beta$  thalassaemia is reported in Maldives (18%), Cyprus (14%), Sardinia (10.3%) and Southeast Asia (3-5%) (Cappellini et al., 2014). In the Arab world, the incidence of Thalassaemia is varied; (8.5%) in UAE, (4.6%) in Libyan Arab Jamahiriya, (4.5%) in Tunisia, (2-4%) in Jordan, (2-3%) in Lebanon, Algeria, and Morocco, and (3%) in Saudi Arabia (Babiker et al., 1999; Hamamy et al., 2007; Baysal, 2011; Taher, 2011).

Countries such as India, Pakistan and Iran are seeing a large increase of thalassaemia patients due to lack of genetic counseling and screening.

Actually, thalassemia affects all races. In the United States, approximately 1,000 individuals have  $\beta$ - thalassemia major (Colah et al., 2010).

Generally, there is growing concern that thalassemia may become a very serious public health problem in the next 50 years, one that will burden the world's blood bank supplies and the health system. Ultimately, there is an urgent need to reduce the disease incidence through implementation of prevention programs, global collaboration on Hb disorders and enabling all countries to benefit from each other's experience (Cappellini et al., 2014).

### **2.3.6.1 Thalassemia in Palestine**

The territory of state of Palestine is composed of two separated geographical areas; West Bank (WB) and Gaza Strip (GS). Based on estimates prepared by Palestinian Central Bureau of Statistics (PCBS), the total population of Palestine at mid 2015 was about 4.68 million (2.86 million in WB and 1.82 million in GS).

Palestine is at a transition phase where the incidence and prevalence of the non-communicable diseases have increased at the same time the health sector is facing a significant challenge of controlling the incidence of some communicable diseases (MOH, 2014-2016). In 2011, PCBS reported that total health expenditure was 12.3% of gross domestic product (GDP) reached \$1679 per capita for 2012 which is a 2.7% increase from 2011 (PCBS, 2015). In fact, as of the year 2011, despite an adult literacy rate of

92.4%, Palestine suffers from an unemployment rate that hovers around 23%, with 1.5 million Palestinians living below the poverty line of \$3.10 per day, and a donor-based economy with roughly 25% of GDP comprising direct foreign assistance (PCBS, 2015). This created an atmosphere embedded with great difficulties hindering the availability, accessibility and, ultimately, quality of healthcare services.

The structure of the Palestinian healthcare system includes primary healthcare centers (PHCs), secondary healthcare centers and tertiary healthcare providers. On the other hand, the Palestinian healthcare sector can best be described as indiscriminate; this is due to the composition consisting of healthcare providers share responsibilities in healthcare service provision ranging from governmental health sector (Ministry of Health), UNRWA, Non-governmental organizations (NGOs) and private sector, with a developing governmental health insurance system.

As Palestine is one of the Mediterranean basin countries in which thalassemia disease is prevalent. There are about 863 registered thalassemia patients, (552 in West Bank + 311 in Gaza Strip). In Palestine the frequency of this thalassemia mutation is equivalent to more than 4-6% of the total population. In other words, there are an estimated around 200,000 carriers of genetic trait in the Palestinian territory increasing the risk of having two couples marry with this gene (Shahin, 2014; TPFs, 2013a).

During the last 20 years a lot of efforts resulted by collaboration between Ministry of Health and Thalassemia Patients' Friends Society

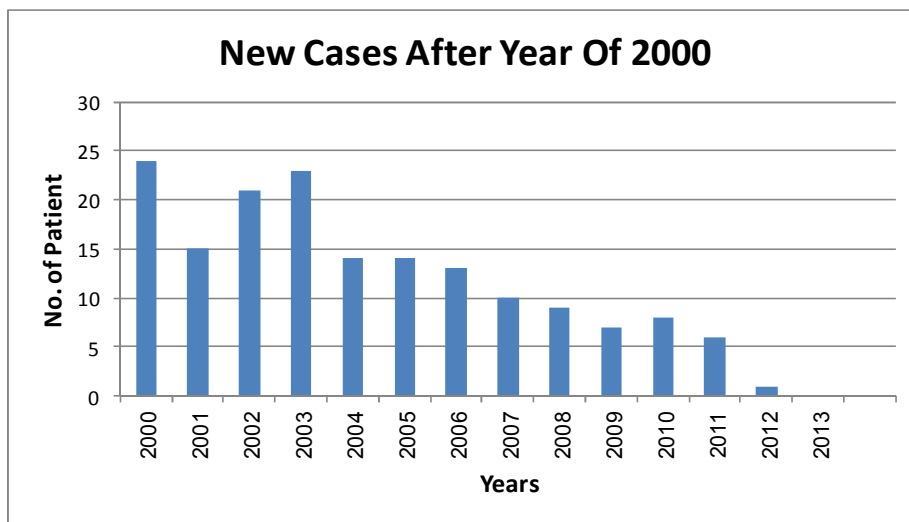


(TPFS) were invested to raise awareness towards the issues of Thalassemia in Palestine. While specialized medical care for thalassemia patients is the responsibility of Ministry of Health, TPFS which was established for supporting patients, awareness-raising and information-sharing about Thalassemia; plays a central role in training the Ministry of Health team, organizing scientific conferences, and other activities directed toward raising the knowledge of the medical staff (Karmi, 2010).

These collaborative efforts achieved many accomplishments. MOH during TPFS first conference in 1997 granted Thalassemia patients and their families' free medical insurance in addition to free coverage of blood for the patients where before parents used to go through tremendous difficulties to provide their children with a unit of blood. Furthermore, quality health services were found to meet the patients' needs through establishing care units at large governmental hospitals, pinpointing the importance of constantly securing safe blood donations, secure the availability of medications, provide social psychological support and the promotion of equal access to quality health care for every patient in Palestine.

On the other hand, creating a social dialogue among the Palestinian community has yielded and promoted the development of policies and regulations, resulting in: issuing binding instructions to attach the pre-marriage certificate with a blood test that indicates that one of partners is free from Thalassemia disease as of 2001. Since that time the number of

new born patients has gradually decreases every year as shown in Figure (2.9). It has dropped from 30-40 cases per year before 2004 to less than 10 registered cases annually since 2004 and to a promising figure of zero cases in the year 2013. This translates into a savings of more than US\$ 35 million (Karmi, 2010).



**Figure (2.9): The Number of New Thalassemia Cases (TPFS, 2013b)**

It is worth mentioning that the quality of health services provided for patients have been improved which reflect on increasing the life expectancy rate, where the average age of Thalassemia patients in Palestine had increased from 7-8 years to 18-19 years throughout the last two decades.

## **2.4 Research Theoretical Framework**

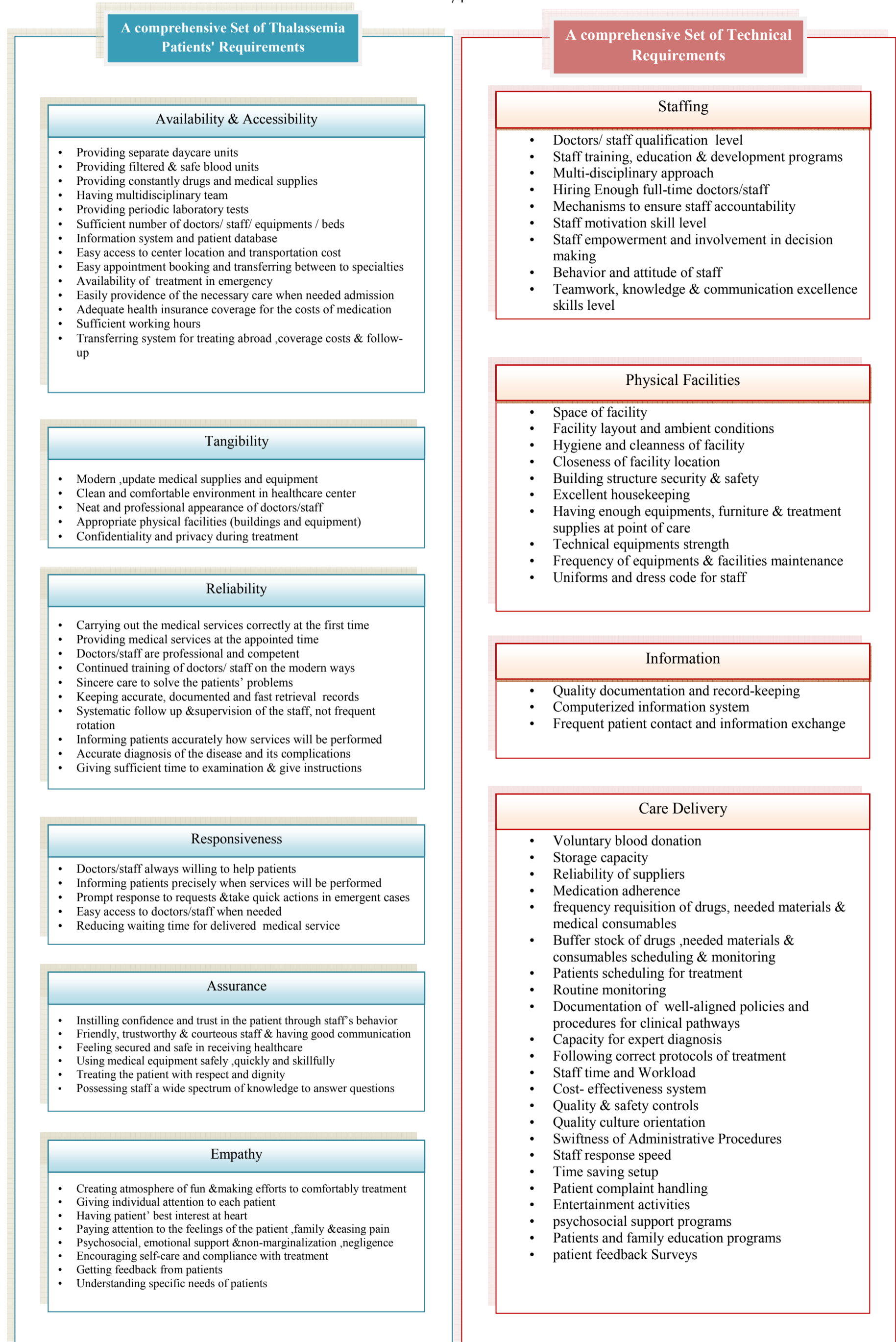
Based on the extensive previous literature, theories, models, guidelines and exploratory interviews; the most significant factors that involved in the application of QFD model were identified.

These factors were grouped in two sets: one for the thalassemia patients' requirements that serve as input for the WHATs in HOQ; and the other for the technical requirements that are the pool of HOWs in HOQ. In this study, the list of patients' requirements was captured by listening to the voice of thalassemia patients; which may state their needs and requirements subjectively; in vague and ambiguous terms; therefore these should be captured unadulterated. In the same way, patients cannot evaluate the technical quality of health care service due to their lack of knowledge of the technical aspects of medical care (Lam, 1997). As a result, in order to yield an effective patient-oriented performance measurement for the health service quality provided in hospitals, the collected data of VOP was analyzed and organized using affinity diagram as well as classified into six categories with the aid of popular service quality SERVQUAL scale; which is accepted as a standard for measuring consumers' perceptions of service quality, accessing different dimension of service quality and facilitating comparison with other findings.

According to the above, the five dimensions of the SERVQUAL model have been adopted in this study and have been modified based on the nature of the medical services provided for thalassemia patients to suit the purpose of this study, such as an additional dimension has been included according to the results from patients' interviews analysis specifically; as discussed in Chapter Four. Eventually, the first set of research factors has been sorted under the six dimensions, namely: (1) Availability & Accessibility (AA), (2) Tangibility (T), (3) Reliability (RL),

(4) Responsiveness (RS), (5) Assurance (AS), and (6) Empathy (E). A total of 48 thalassemia patients' requirements have been identified, as shown in Figure (2.10). Furthermore, other factors related to the patients' characteristics may influence a patient's assessment of hospital performance have been included. Such as: location, gender, age, level of education, having a job, monthly income and health status.

On the other hand, the list of technical requirements has been determined on the basis of patients' requirement transforming these qualitative requirements into quantitative and measurable service quality specifications. A brainstorming among experts was used together with literature reviews to develop these specifications. The second set of research factors has been classified under four aspects: (1) Staffing, (2) Physical facilities, (3) Information, and (4) Care delivery. A total of 45 service quality specifications have been identified, as shown in Figure (2.10).



**Figure (2.10): The Factors involved in the application of QFD model**

**Chapter Three**  
**Research Methodology**

## **Chapter Three**

### **Research Methodology**

#### **3.1 Chapter Overview**

In order to develop a generic QFD model and answer the questions of the research, a convenient research methodology was chosen. A description of the characteristics of the methodological approach and data collection technique is provided in this chapter.

#### **3.2 Research Approach**

Each research has its properties and uniqueness; thereby the selection of research approach is completely dependent upon the nature of research itself (Alhamadni et. al. 2006). Research approach can be categorized according to its purpose. According to Saunders et al. (2003), who have classified it as exploratory, descriptive, and explanatory. Exploratory research is a valuable method of finding out “what is happening; to seek new insights; to ask questions and to assess phenomena in a new light” (Robson, 2002). It conducts for a problem that has not clearly defined and examines the relevant factors in detail to get an appropriate description of the reality of the existing situation (Brink and Wood, 1998). Descriptive research is ‘to portray an accurate profile of persons, events or situations’ (Robson 2002). In this type, the problem is known; so it needs to provide an accurate description of the current situation of the problem and measure the characteristics described in a research questions.

Explanatory research is “conducted in order to explain a cause- and- effect relationship between different variables during the study of a problem or a particular situation” (Saunders et al., 2003).

This thesis attempts to contribute towards developing a model that will eventually be useful to increase the enhancement of quality healthcare delivery for thalassemia patients in Palestine. In order to reach this purpose, an exploratory research inquiry was used to identify and investigate relevant factors related to QFD process that supports the creation of effective quality system for medical service based on patients’ perspectives as well as suitable for the Palestinian healthcare industry.

### **3.3 Research Strategy**

According to Saunders et al. (2009), the research strategy illustrated as a plan for drawing the research path through reflects the general approach and goals of a research study. Usually there are two types of research strategies: quantitative research and qualitative research or mixed of both used to differentiate both data collection techniques and data analysis procedures. Qualitative approach offers richly descriptions of individuals’ perceptions, attitudes, beliefs, views and feelings and gives information about thoughts and experiences of people (FHI, 2005). Quantitative approach depends on numerical data and statistics to describe the phenomenon and explore the correlations between its variables (khan, 2009).



To solve the research problem and research questions, a sequential exploratory mixed method that combines both qualitative and quantitative approaches were used. A structured questionnaire and exploratory interviews were adopted together in order to collect the data and understand the current situation of the medical services in Palestinian hospitals whereas qualitative approach is used in this area. On the other hand, to clarify the factors which influence healthcare quality characteristics' adopted by patients and study the correlations between these factors. In the case, the variations are quantified, the causal relationships are determined and the characteristics of the population are also described. Furthermore, the quantitative benchmark analysis is needed to be confirmed, so statistical tools and programs are used in order to extract and categorize responses to questions in the questionnaires with highly structured methods whereas quantitative approach is used in this area.

### **3.4 Research Methodology Flow Chart**

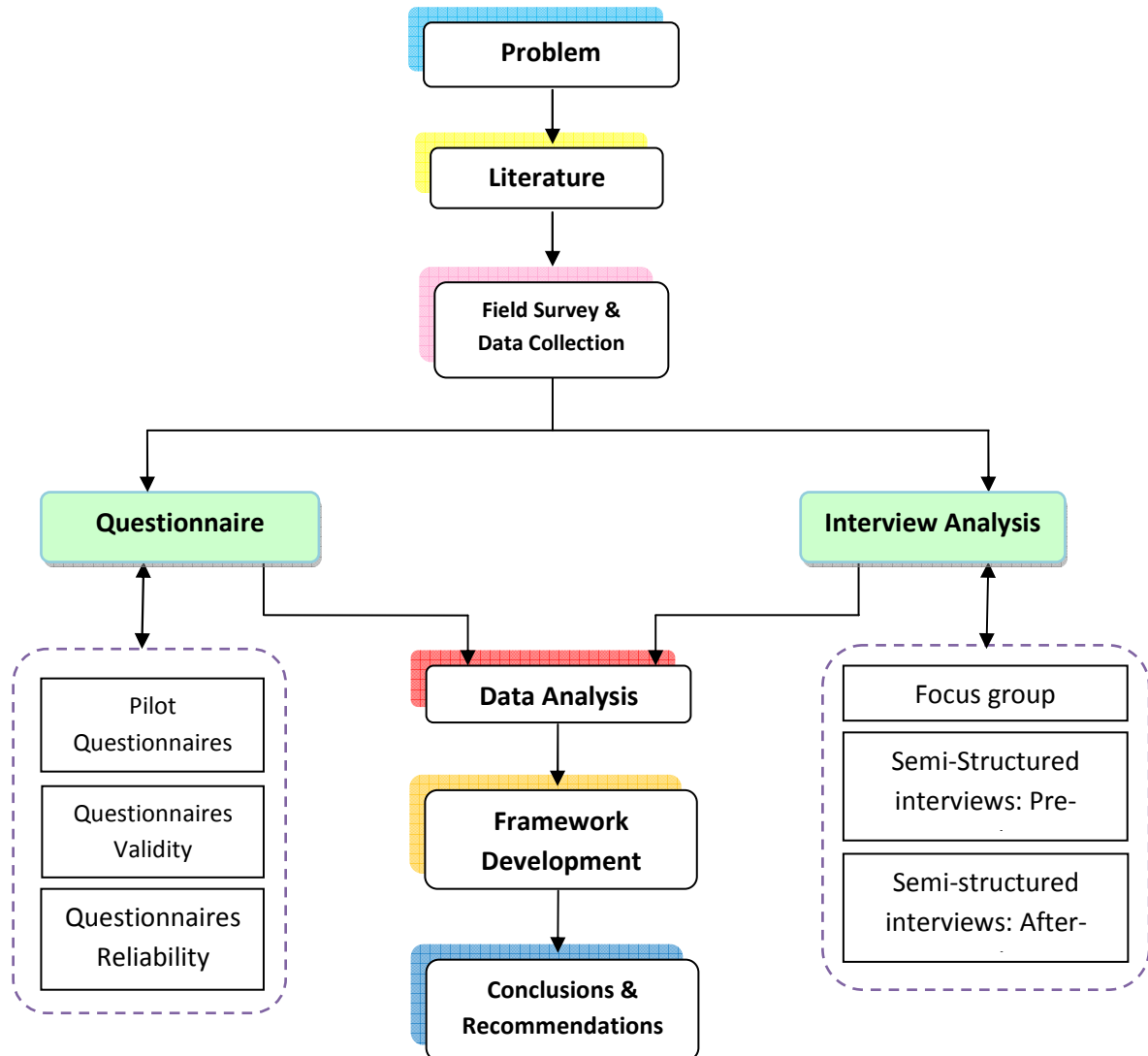
In order to provide the roadmap for implementing the research methodology, Figure (3.1) illustrates the flow chart which represents the sequence of activities carried out in order to achieve the research goals. This research is initiated by defining research problem and objectives which come after topic selection; the QFD related topics which form the main base for the research are reviewed. After that, the targeted hospitals are chosen as a representative research population. A field survey is made to choose some of these hospitals as a representative research sample in

order to investigate the current situation of the medical services in Palestinian hospitals and benchmark against the best-in-class rival hospitals in order to solve the research problem. Simultaneously, the exploratory interviews are conducted to gather the VOP and identify a comprehensive set of critical patients' requirements that represent the most crucial step of the QFD process.

After that, a structured questionnaire is developed for patients in order to gather the data about the level of patient satisfaction with the quality of medical services provided affecting the evaluation of hospital's performance as well as patient importance rating of requirements affecting patients' needs priorities. Through questionnaire design, a pilot study was conducted by experts to test whether the questions are clear, valid and easy to answer. Then the questionnaires are distributed to 325 patients in thalassemia units at targeted governmental hospitals and gathered after filling. Questionnaires are analyzed using statistical tools and methodologies; Statistical Package for the Social Sciences (SPSS) is used for this purpose.

Finally, according to the results come up from analysis stage and according to the related researches and observations within research environment; a holistic QFD model, which aimed to improve service quality using patients' needs priorities that will be translated into technical attributes needed to satisfy patient requirements is developed. At the end, the conclusions, recommendation and future studies are discussed.

Throughout these stages; the sequential mixed methods design; (qualitative first then followed by quantitative) are used.



**Figure (3.1): Research Methodology Flow Chart**

### 3.5 Research Population and Sample Size

The main objective of the study is to understand the VOP, evaluate a hospitals' quality effort, then to develop a comprehensive QFD framework that improves the quality performance based on competitive benchmarking; through identifying and benchmarking the best practices among competitors. Consequently, the population of this study was the all

thalassemia patients who receive medical treatment in thalassemia clinics at governmental hospitals that reside at West Bank, Gaza and Dubai.

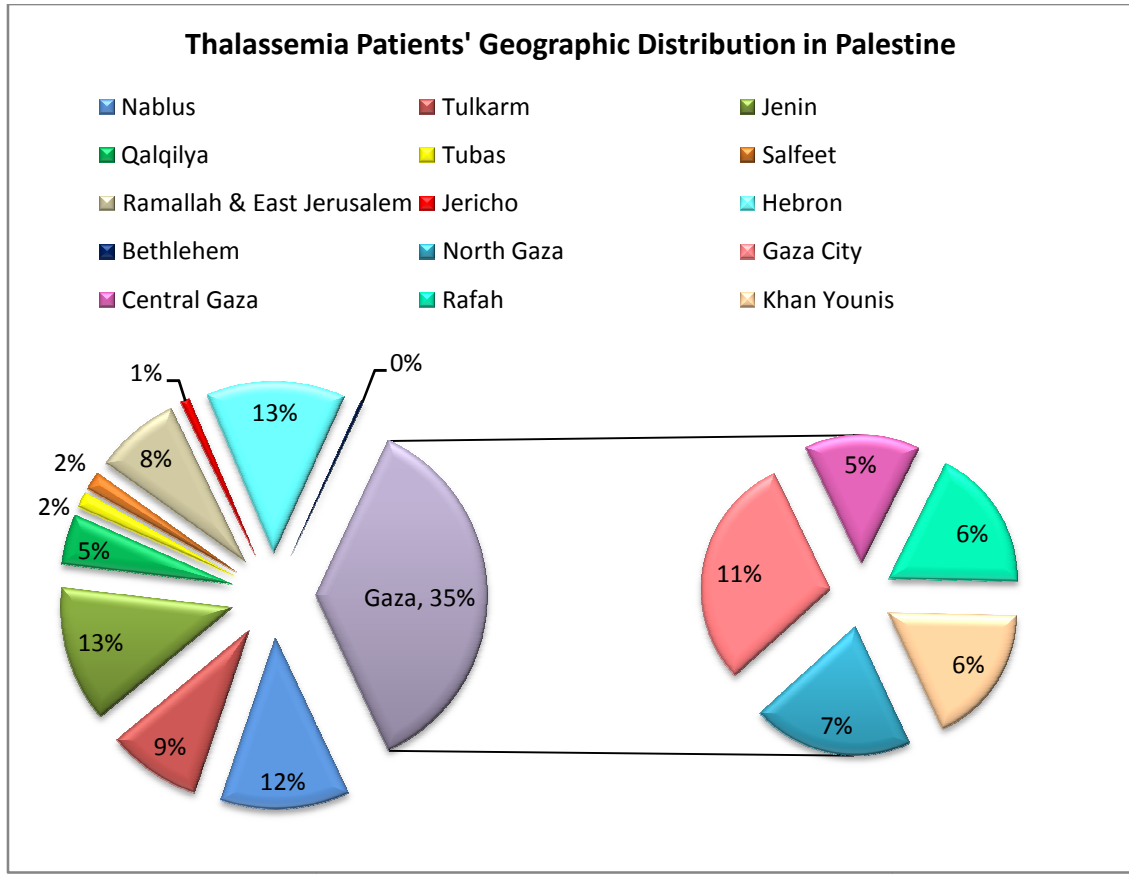
Thalassemia centre in Dubai has been chosen as a one of best-in-class quality performance due to being the first in the Middle East which has granted accreditation from the Joint Commission International Accreditation (JCIA), which is one of the world's leading nonprofit patient safety organizations and recognized as the 'Gold Seal of Approval' for international quality standards for patient care and organization management (JCI, 2016). In addition, the centre was awarded "The Shiekh Hamdan Excellency Award for Medical Sciences". Also, it is an accredited training centre for the students of Dubai Medical College and the Arab Board Community Medicine (Thalassemia DC, 2014).

It should be noted, unfortunately there are no official reports prepared by MOH or PCBS mentioning the total number of thalassemia patients in Palestine. But there are statistics prepared at the end of 2013 by TPFS around of 863 registered patients. In West Bank, there are about 552 registered patients and in Gaza there are about 311 registered patients. On the other hand, actually the exact number of thalasseemics in the United Arab Emirates (UAE) is unknown because there are no official reports estimating the total number of thalassemia patients in the UAE. But there are statistics prepared at the end of 2014 by Dubai Thalassemia Centre around of 817 registered patients of different nationalities suffer from the disease received treatment in this thalassemia centre. The distribution of

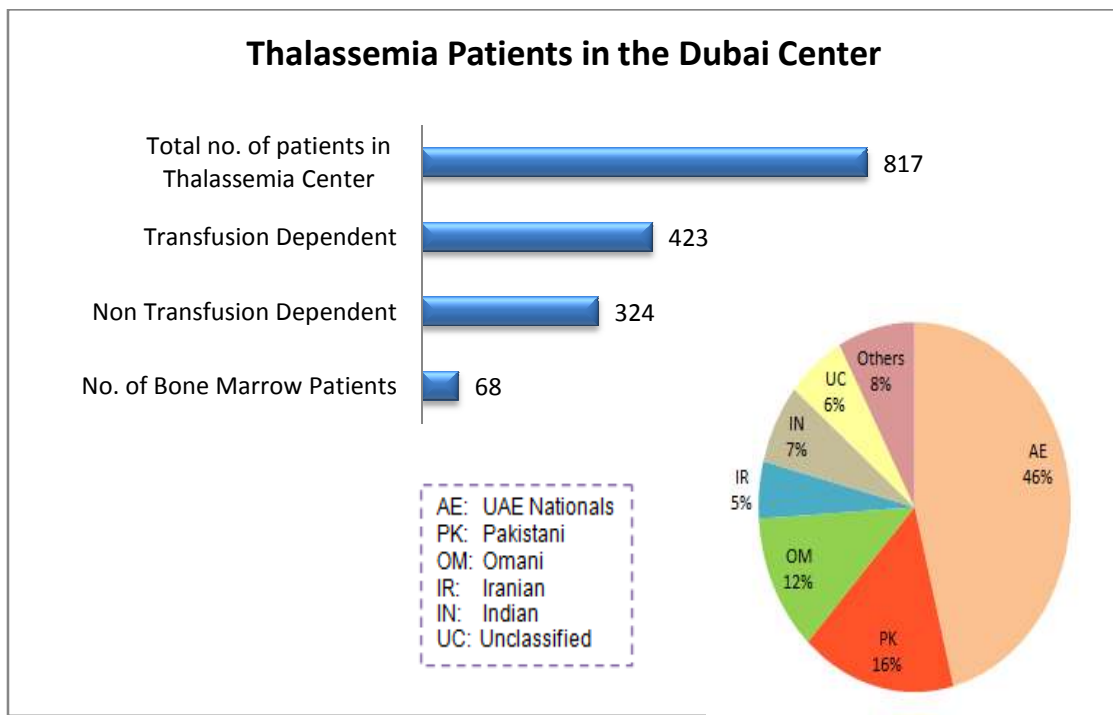
thalassemia patients in Palestine and Dubai centre are shown in Figure (3.2) and (3.3) respectively.

Accordingly, many governmental hospitals are spread out in all West Bank and Gaza districts besides Dubai. Therefore, the patients in each districts' hospitals having their own culture and beliefs depending on the lifestyle, geographical area in addition to the influential circumstances of healthcare system related to organizational and infrastructure factors, demographic and social factors, political, as well as economic ones. As a result of this heterogeneous population as illustrated, the stratified random sampling has been used and the population divided into reasonable groups, each subgroup represents a hospital which termed stratum. Then the stratification followed by random selection of participants from each stratum based on the proportionality of regular patients in each hospital.

In the same context and to form a research model, the study focused on the regions include the highest number of patients, and choose the largest main governmental hospitals in WB and GS which provide most of the health care services, and have special clinics and daycare units that serve most of the thalassemia patients.



**Figure (3.2): The Distribution of Thalassemia Patients in Palestine (TPFS, 2013b)**



**Figure (3.3): The Distribution of Thalassemia Patients in Dubai Thalassaemia Centre (Thalassaemia DC, 2014).**

The empirical study was carried out in seven governmental hospitals which selected from different trends and location as competitors; five hospitals were selected in WB, one hospital in GS and Dubai thalassemia centre. According to the targeted hospitals, the total number of available population is 1111 as shown in Table 3-1. This total number represents the regular patients in each selected hospital and it was obtained from documented data in the medical records at the end of 2015.

**Table (3-1): Distribution of study population**

| Group            |   | Selected Hospitals            | District    | Total No. of Regular Patients | No. of Surveyed | Valid Surveyed |
|------------------|---|-------------------------------|-------------|-------------------------------|-----------------|----------------|
| <b>West Bank</b> | 1 | Al-Watani Hospital            | WB-Nablus   | 184                           | 46              | 140            |
|                  | 2 | Dr. Thabet Thabet Hospital    | WB-Tulkarem | 77                            | 20              |                |
|                  | 3 | Dr. Khaleel Sulaiman Hospital | WB-Jenin    | 130                           | 34              |                |
|                  | 4 | Palestinian Medical Complex   | WB-Ramallah | 53                            | 14              |                |
|                  | 5 | Public Alyah Hospital         | WB-Hebron   | 114                           | 29              |                |
| <b>Gaza</b>      | 6 | Al-Shefaa medical Complex     | Gaza        | 130                           | 34              | 55             |
| <b>Dubai</b>     | 7 | Dubai Thalassaemia Center     | Dubai       | 423                           | 109             | 96             |
|                  |   | <b>Total</b>                  |             | <b>1111</b>                   | <b>286</b>      | <b>291</b>     |

|                           |            |
|---------------------------|------------|
| Confidence Level          | 95%        |
| Confidence Interval       | 5          |
| Population                | 1111       |
| <b>Sample Size needed</b> | <b>286</b> |

To obtain statistically representative sample size of the population; Thompson formula is used (Thompson, 2012):

$$n = \frac{N * P(1 - P)}{[(N - 1) * \left(\frac{d^2}{z^2}\right)] + P(1 - P)} \dots\dots\dots (1)$$

Where:

n = the sample size.

N = the total number of population, 1111.

d = the percentage error (0.05)

P = proportion of the property offers and neutral (0.5).

z = z value is the upper  $\alpha / 2$  of the normal distribution (1.96 for 95% confidence level).

Based on the results of sample size computation, the targeted population size is 1111, so this study needed 286 samples to complete the survey with 95% confidence level and 5% confidence interval.

### **3.6 Research Tools of Data Collection**

Data has been collected using both primary and secondary data sources. The primary data of research included: (1) structured questionnaires on a 5- point likert scale and (2) interviews with some thalassemia patients and selected key personnel in hospitals to collect in-



depth information. On the other hand, The Secondary data of research included a literature search is gleaned from publications, documents, reports, archival records and previous researches in relation to the research subject mainly from international journals articles, books, newsletters, documentaries, internet websites and MOH, TPFS and PCBS records, publications and statistics. As shown in Figure (3.1), the field survey and data collection in this study were explored using both questionnaire survey and exploratory interviews technique.

### **3.6.1 Exploratory Interviews**

The process of interviewing involves asking questions, listening to individuals or small groups, and promoting conversation in order to gain information and understanding of opinions through conversations, either face-to-face or by phone (Walliman, 2006; O'leary, 2004).

Walliman (2006) and O'Leary (2004) mentioned three types of interviews; structured with standardized questions and closed format answers, that minimizes personal interactions; unstructured with a flexible format without closed format answers, that is suitable for ongoing conversation; and finally semi-structured interview that combines sections from the two previously mentioned types with standardized and open format questions.

For this study, the semi-structured interviews with open-ended questions were used. A simple guiding protocol was used as a backup to

help in following major concepts in the conversations. Every interviewee was asked whether he/she was comfortable with the use of audio tape to record the interview in order to remove the sense of anxiety and discomfort. Recording interviews was very helpful in supporting the researcher producing accurate transcripts and allowed for re-listening of interviews to ensure unbiased note taking (Easterby-Smith et al., 2002). A confirmation of information confidentiality and that the collected data would only be used for research purposes was provided.

### **3.6.1.1 Focus Group**

A focus group is “a discussion-based interview involving several participants and a moderator, whose role is to facilitate the discussion” (Brewerton and Millward, 2001). In this study, the researcher’s role is a moderator. The researcher is an administrative member and trainer of the patient's quality of life program at TPFS society, which supporting patients and advocating their rights and needs. Such experience qualifies the researcher with required knowledge to describe the current situation of the medical services provided to thalassemia patients in Palestine. As first data was collected from a focus group of 20-25 thalassemia patients ranged in age from 18 -29 years. A focus group was used in this study for eliciting ideas, thoughts and perceptions from patients and also to understand the problems they face while receiving their medical services in hospitals. The collected ideas were then used in formulating the questionnaire.

### **3.6.1.2 Semi-Structured Interviews: Pre-study**

The semi-structured interview was formulated to answer the main research questions. Face-to-face and telephone interviews were conducted with patients in order to get a deeper discovery of health services reality at Palestinian hospitals and also to obtain rich information about the basic needs and requirements. Ten Palestinian patients ranged in age from 18-25 from different districts of hospitals interviewed in this study. These patients have been chosen as members in Thalassemia Patients Youth Council who were trained to be representative to their districts. They are two from Nablus, one from Jenin, another from Tulkarm and the other from Ramallah, two from Hebron and three from Gaza. These dependent-transfusion patients have been diagnosed with thalassemia major since birth and undergoing thalassemia treatment regularly. The collected information is used in formulating the questionnaires. A list of questions that used in the semi-structured interview approach is presented in (Appendix A).

### **3.6.1.3 Semi-Structured Interviews: After-study**

After completing the patients' requirement list and receiving the filled questionnaires and analyzing the data, a list of technical requirements has been generated to define how patients' requirements can be satisfied. Ten semi-structured face-to-face interviews were conducted individually with medical directors, heads of hematology department, heads of quality office and physicians working in the seven targeted hospitals. They have been recruited through a list of professionals who are interested in

Thalassemia field that has been got from TPFS records. The purpose of conducting these interviews was to discuss these requirements and to understand each hospital's technical performance, competitive assessment of hospitals from a technical perspective and identify the difficulty or probability to improve the medical services.

### **3.6.2 Questionnaire Survey**

The questionnaire survey is the most commonly used research methods and can be used to gather information on any topic from large or small numbers of people. It is a written list of questions and the answers are recorded by respondents (Frankfort-Nachmias and Nachimas, 1992).

#### **3.6.2.1 Questionnaire Design**

Data for this research were primarily gathered through a structured questionnaire. The questionnaire was designed for identifying and prioritizing patients' requirements, and for competitive benchmarking and assessing hospitals' service quality performance from the patients' point of view. Thus, questionnaire parts were constructed with the aid of the popular service quality SERVQUAL instrument based on literature review from publications and journals' articles, and the results from patients' interviews analysis and together with revision and modifications by local experts.

The target respondents were the thalassemia patients who have been undergoing thalassemia treatment regularly in the targeted hospitals. This

questionnaire was designed in both English and Arabic languages (attached in Appendix A) and started by introducing the purpose of the survey and providing instructions for filling out the questionnaire. The study questionnaire was comprised following major parts: Part one of the questionnaire was mainly designed to obtain general information regarding the participants' gender, age, level of education, having a job, monthly income, hemoglobin level and ferritin level that affect the patient's health status, in order to explore the diversity of the sample within the hospitals as shown in research population.

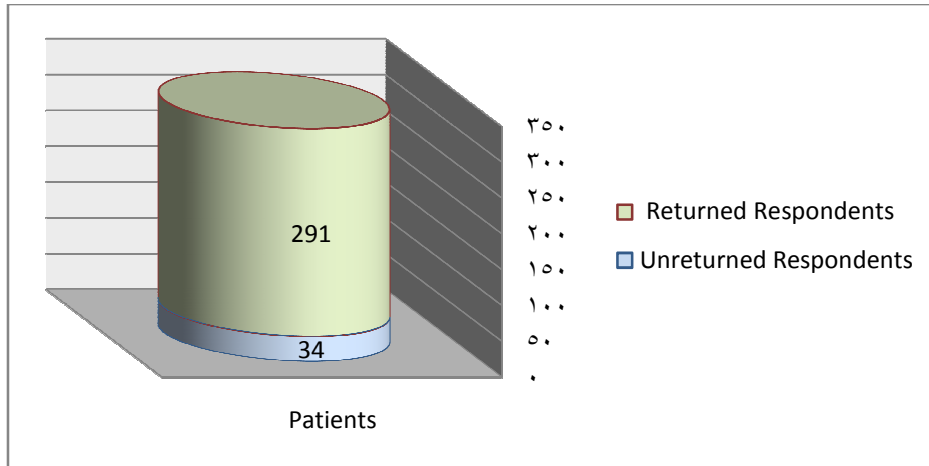
Part two of the questionnaire included a list of 48 statements related to the main requirements of the medical services that any thalassemia patient aspiring to get from the hospital which have been determined in the previously proposed theoretical framework in this research. These statements aim to measure hospitals' service quality performance; that were grouped into six dimensions: (1) Availability & Accessibility (AA), (2) Tangibility (T), (3) Reliability (RL), (4) Responsiveness (RS), (5) Assurance (AS), and (6) Empathy (E). Respondents were asked to answer two phases: First phase, they asked to score and express their satisfaction of each requirement of services regarding the hospital quality performance according to their own judgment and treatment experience in the targeted hospitals using a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). Second phase, they asked to rate the importance of each requirement based on their own perceptions and preferences to identify which requirements are the most important for a hospital to have;

using a five-point Likert scale ranging from "5" most important, "4" important, "3" natural, "2" least important and "1" not important.

### **3.6.2.2 Distribution of Questionnaire and Response Rate**

The proportional stratified sampling was adopted to collect data from the selected governmental hospitals spread out in WB, GS and Dubai. Some questionnaires were distributed and filled directly face to face interview in the accessible hospitals, others were distributed via coordination with contact person in hospitals. Participation in the survey was voluntary. It should be mentioned that the researcher herself personally visited Dubai thalassemia centre, met the staff, presented the research and collected data. She owed to the great cooperation and efforts from heads of this center who showed a great interest regarding the research and welcoming to be a part of the study; thus it has been agreed to work as a joint research and sharing the results. Additionally, the collaboration of specialist nurses in Palestinian thalassemia daycare units, whereas the questionnaires were distributed and collected through their help.

For this research, 325 questionnaires were distributed among all patients treated at the thalassemia daycare units (pediatrics and adults) and were willing to give consent. Outpatients and those patients unwilling to participate in the study will be excluded from the study. However, the total number returned and valid questionnaires are 291 questionnaires. This represented a response rate of 88.9 % as shown in Figure (3.4).



**Figure (3.4): Questionnaire's Response Rate**

### **3.7 Quality Standards for Research Tools**

#### **3.7.1 Pilot Study**

A pilot study allows researchers to conduct a pretest or a preliminary analysis on a limited scale before conducting a full-blown study. Pilot study aims to refine and improve the questionnaire, determine whether the questions are comprehensible so that the participants are able to understand and interpret the questions without facing any problems. It reduces the possibility of getting incomplete answers (Saunders, 2000).

Before distributing the questionnaire, this research tool was reviewed by six experts and arbitrators to test whether the questions are clear, valid and easy to answer. Experts and arbitrators made comments on the contents, and the format of the questionnaire. After the questionnaire was refined, a pilot testing was conducted with eleven participants were selected from different hospitals to review and answer the questionnaires in order to assure simplicity and clarity of the questions. Moreover, the Arabic and English survey were distributed to a sample of six patients who can

speak both languages to ensure that these patients understand both surveys in the same way. The participants who are involved in pilot study were excluded from the research sample and the final analysis.

All the comments and the suggestions from experts, arbitrators, and participants are discussed with the supervisor and then adjustments are made to modify and improve the questionnaires' contents and wordings by omitting, adding or rephrasing items. Questionnaires are refined and became ready for distribution.

### **3.7.2 Reliability and Validity**

Reliability and validity are the yardsticks against which the adequacy and accuracy of the measurement procedures are evaluated in scientific research (Gliem and Gliem, 2003). Consequently, to make sure that the measures were used are consistent, both reliability and validity should be measured.

Reliability is the degree of consistency or repeatability of research tools measures and used to insure internal consistency and to achieve high degree of homogeneity between questionnaire statements. In this research, in order to ensure the internal consistency of Likert scale of the questionnaire and measure the correlation between each item in the questionnaire, Cronbach's Alpha test was used, where a value of 0.7 or more represents a good criterion for scale reliability (Gliem and Gliem, 2003) as shown in Table 3-2.



**Table (3-2): Cronbach's Alpha test**

| Cronbach's Alpha        | Internal Consistency |
|-------------------------|----------------------|
| $\alpha \geq 0.9$       | Excellent            |
| $0.7 \leq \alpha < 0.9$ | Good                 |
| $0.6 \leq \alpha < 0.7$ | Acceptable           |
| $0.5 \leq \alpha < 0.6$ | Poor                 |
| $\alpha < 0.5$          | Unacceptable         |

According to the Cronbach's Alpha test of the questionnaire, the total reliability of the questionnaire is (0.974), which indicates excellent consistency. Therefore, the research tool was considered reliable. Validity refers to the degree to which an instrument measures what it is supposed to be measuring (Polit and Hungler, 1985). The research validity is achieved through the following steps:

- Arbitrators and experts who are specialists in quality engineering and thalassemia fields asked to refine the research tools as well as a pilot testing which conducted with eleven participants from different hospitals. Thus, modifications and adjustments are made and discussed deeply with the supervisor in order to assure the efficiency of research tools in achieving the research objectives.
- Multiple research methods and approaches are utilized in data collection, including quantitative methods represented by the questionnaire survey and qualitative methods represented by the semi-structured interviews.
- Many sources of data are used in data collection, involving primary and secondary data that are credible and reliable.

### **3.7.3 Ethical Consideration**

Ethical standards and considerations are followed in all research stages. An important issue in research is to achieve confidence through preserving participants' anonymity (Smith and Quelch, 1992).

Confidentiality and anonymity was guaranteed for all participants who are surveyed and interviewed. The process of distributing the questionnaires was conducted according to the hospital confidentiality policy. Ethical review and approval for this research was granted by General Directorate of Education in Health in Palestinian Ministry of health and Dubai Scientific Research Ethics Committee in Dubai Health Authority. To ensure the protection of study participants, all patients and providers received and signed an informed consent form. As a result, hospitals and individuals had a complete willingness to participate in this study and there was not any type of coercion to participate in the study.

### **3.8 Data Analysis Approach**

Analyzing process is the way of reasoning (Walliman, 2006). It aims at drawing meaningful conclusions. In this research, statistical calculations and thematic analysis have been used to handle both of quantitative and qualitative data.

The quantitative data acquired from the questionnaires have been analyzed using Statistical Package for the Social Sciences (SPSS) program.

Many statistical descriptive and test have been used to find out descriptive statistical analysis that help in answering the research questions. Such as:

- Means, frequencies, standard deviations and percentages to represent the collected data in meaningful numbers.
- Two independent sample T- test the significance difference between two independent variables.
- One-Way Analysis of Variance (ANOVA) to indicate the significance difference between more than two independent variables and to test the hypotheses.
- Post-hoc test (LSD) to understand the difference in specific independent variable due to certain variable.
- Pearson Correlation matrix to study the relationships between the study factors.

The following scale which was used to represent the estimation level of participants' responses in the research:

**Table (3-3): Scaling Degree or Interval Classification**

| <b>Interval</b>       | <b>Degree</b> |
|-----------------------|---------------|
| <b>1.0 –1.8</b>       | Very Low      |
| <b>&gt; 1.8 – 2.6</b> | Low           |
| <b>&gt; 2.6 – 3.4</b> | Moderate      |
| <b>&gt; 3.4 – 4.2</b> | High          |
| <b>&gt; 4.2 – 5.0</b> | Very High     |

The qualitative data acquired from the pre-study interviews have been analyzed using thematic analysis. According to Braun and Clarke

(2006), thematic analysis is a widely method used for ‘identifying, analyzing, and reporting patterns (themes) within the data’. The full process of analysis followed in this research is illustrated in the following stages (Braun and Clarke, 2006):

- Getting more familiar with data by reading it several times and noting initial data.
- During reading, observing the presence of patterns and in a systematic fashion code the interesting features of data through the entire data set, then gathering data relevant to each code.
- Collecting codes in themes that describe the data accurately.
- Reviewing themes to make sure they support the study.
- Defining and naming themes.
- Validating the chosen themes by building a valid argument.

# **Chapter Four**

## **Data Analysis and Results**

## **Chapter Four**

### **Data Analysis and Results**

#### **4.1 Chapter Overview**

This chapter analyzes and presents the results of the qualitative and quantitative data collected from interviews and questionnaires. The first section explores the SERVQUAL dimensions from the viewpoint of patients who were interviewed. Thereafter, this chapter presents the results of descriptive statistics derived from the Statistical Package for the Social Sciences (SPSS) software, by which this study determines the current situation of healthcare provided to thalassemia patients in Palestinian hospitals. At the end, this chapter presents the results from the professionals' perspectives who were interviewed in order to technical benchmarking analysis.

#### **4.2 Pre-Study Interviews Analysis**

Based on the pre-study data collected through semi-structured interviews; that conducted with ten patients in order to identify patients' perceptions of Palestinian hospital services and shed-light to the problems that thalassemia patients' face while receiving their services in hospitals, thematic analysis has been used to analyze these interviews. The results from the pre-study semi-structured interviews were classified into six themes. Table 4-1 provides a summary of all used codes, basic themes were found and the six central themes were identified.

**Table (4-1): Summary of identified codes, basic themes, and central themes**

| Codes                                                                                                                                                                                                           | Issued discuses                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Basic theme                                                                                                                                    | Center theme                                                               |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------|
| <b>Blood Tests</b><br><b>Drugs doctors</b><br><b>Shortage</b><br><b>Insufficient</b><br><b>Costly</b><br><b>Difficult</b><br><b>lack</b><br><b>Volume</b><br><b>Procedures</b><br><b>Number</b><br><b>Shift</b> | <ul style="list-style-type: none"> <li>• Shortage of treatment supplies</li> <li>• Shortage of necessary drugs</li> <li>• Lack of necessary laboratory tests</li> <li>• quality of blood</li> <li>• Lack of Specialists</li> <li>• Lack of psychologist &amp; social worker</li> <li>• Number of doctors and nurses</li> <li>• Provide specialized units</li> <li>• Sharing the same room with oncology/hemophilia patients</li> <li>• Number of rooms, beds and equipments</li> <li>• High cost of medications and tests</li> <li>• Cost of transportation</li> <li>• Difficulty procedures in referrals</li> <li>• Problematic treatment in emergency and admission at the hospital</li> <li>• Complexity of outside treatment</li> <li>• Follow up &amp; needed tests for bone marrow</li> <li>• Coverage of the health insurance</li> <li>• Insufficient working hours</li> </ul> | <ul style="list-style-type: none"> <li>• Providence of the necessary treatment needs</li> <li>• possibility of getting the services</li> </ul> | <p style="text-align: center;"><i>Availability &amp; Accessibility</i></p> |
| <b>Poorness</b><br><b>convenient</b><br><b>comfort</b><br><b>space</b><br><b>Privacy</b><br><b>Environment</b><br><b>Clean</b><br><b>Equipments</b>                                                             | <ul style="list-style-type: none"> <li>• size of treatment unit</li> <li>• Comfortability of rooms</li> <li>• Poor quality of beds, supplies and equipments</li> <li>• Cleanliness of environment and equipment</li> <li>• Absence of the privacy</li> <li>• Improved construction</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | <ul style="list-style-type: none"> <li>• Convenience of physical facilities and equipments</li> <li>• environmental conditions</li> </ul>      | <p style="text-align: center;"><i>Tangibility</i></p>                      |
| <b>Delays</b><br><b>diagnosis</b><br><b>Follow up</b><br><b>care</b><br><b>Negligence</b><br><b>Expertise</b><br><b>Information</b>                                                                             | <ul style="list-style-type: none"> <li>• Delayed service provision</li> <li>• follow-up system necessity</li> <li>• needed of follower doctors and nurses</li> <li>• needed of periodically Medical examinations</li> <li>• Misdiagnosis cases &amp;</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | <ul style="list-style-type: none"> <li>• dependable &amp; Accurately performance of the service</li> </ul>                                     | <p style="text-align: center;"><i>Reliability</i></p>                      |

|                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                           |                              |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|
|                                                                                                                                                                                     | <ul style="list-style-type: none"> <li>• complications</li> <li>• competencies and expertise of doctors</li> <li>• Skillfulness of personnel</li> <li>• Medical Negligence</li> <li>• Disregarding medical errors</li> <li>• Absence of complaint handling</li> <li>• explanation of illness/treatment</li> <li>• usage of computerized system</li> <li>• keeping records and database</li> </ul>                              | <ul style="list-style-type: none"> <li>• free error Performance</li> <li>• Performance quality</li> </ul>                                 |                              |
| <p><b>Long time</b><br/><b>Promptness</b><br/><b>Urgent</b><br/><b>Delay</b><br/><b>Answer</b></p>                                                                                  | <ul style="list-style-type: none"> <li>• Lengthy waiting time</li> <li>• access to doctors</li> <li>• Busy to response</li> <li>• Needed of prompt reaction in urgent cases</li> <li>• willingness to help</li> <li>• informing to and from patients</li> </ul>                                                                                                                                                                | <ul style="list-style-type: none"> <li>• providing prompt service</li> <li>• flexibility response</li> </ul>                              | <i><b>Responsiveness</b></i> |
| <p><b>Behavior</b><br/><b>Interpersonal</b><br/><b>Maltreatment</b><br/><b>Safety</b><br/><b>Skills</b></p>                                                                         | <ul style="list-style-type: none"> <li>• Friendly and courtesy behavior of doctors/staff</li> <li>• Improved interaction with patients</li> <li>• communication skills necessity</li> <li>• the sufficient knowledge to answer patients' questions</li> <li>• trust and safe feeling</li> </ul>                                                                                                                                | <ul style="list-style-type: none"> <li>• Personnel behavior and attitude</li> <li>• confidence and trust in receiving services</li> </ul> | <i><b>Assurance</b></i>      |
| <p><b>Support</b><br/><b>Kindness</b><br/><b>Feeling</b><br/><b>Attention</b><br/><b>Children</b><br/><b>Boring</b><br/><b>Pain</b><br/><b>Activities</b><br/><b>Depression</b></p> | <ul style="list-style-type: none"> <li>• Limited fun atmosphere</li> <li>• Limited support to solve patients' problems</li> <li>• Improved patient care and attention</li> <li>• The kindness attitude with patients and families</li> <li>• Absence psychosocial Support</li> <li>• necessity of caring patients' feeling</li> <li>• personnel role of encourage patients</li> <li>• Absence feedback from patient</li> </ul> | <ul style="list-style-type: none"> <li>• Care and attention to patient</li> <li>• psychosocial Support</li> </ul>                         | <i><b>Empathy</b></i>        |

The six themes emerged from the in-depth interviews are presented below:



### **Theme One: Availability & Accessibility**

All interviewees revealed that providing necessary treatment needs in appropriate quality and quantity in addition to the accessibility of the services are the most critical challenges they face at hospitals. The major points of this theme can be summarized as follows:

- ✚ All interviewees strongly agreed that there is a shortage of treatment supplies and necessary drugs especially in Gaza hospitals.
- ✚ Most of interviewees argued that some hospitals lacked several laboratory tests that thalassemia patients need as (ferritin, hormones, osteoporosis, hepatitis, etc....) and they had to do it in private centers which are too expensive.
- ✚ Most of interviewees indicated that the blood they need is available but with incomplete quality which could cause allergies to some.
- ✚ Most of interviewees mentioned that there is insufficient number of doctors and nurses to the point that there is no any doctor following the patients as: Jenin hospital, in contrast there are blood specialists in Gaza hospitals.
- ✚ All interviewees agreed that there are specialized units in hospitals but in some cases they had to share the rooms with other patients e.g. oncology/hemophilia. Additionally, the number of equipments and beds are not enough.

- ✚ Most of interviewees suffer from the difficulty to access the hospital due to the costly transportation.
- ✚ Few interviewees face the difficulty of hospital procedures related to emergency, admission and referrals.
- ✚ All interviewees agreed that the health insurance covered the services provided at hospitals.
- ✚ Most of interviewees longed to increase the work hours to fit their needs.

### **Theme two: Tangibility**

According to this theme which is related to the physical facilities and environmental conditions, most of interviewees mentioned that the quality of beds and equipments is poor in addition to the absence of privacy consequently; the environment is uncomfortable which need to expand and improve the building.

### **Theme three: Reliability**

According to this theme which related to the necessity of providing perfect performance of the promised services, interviewees expressed that as follows:

- ✚ All interviewees strongly declared their need to a regular following-up system for medical examinations and an appropriate appointment schedules for regular blood transfusions.

- ✚ Most of interviewees agreed on the necessity of accurate diagnosis especially in complicated cases. Whereas some of them mentioned a few misdiagnosis which could result from the limited competences and experts or negligence and disregarding medical errors.
- ✚ Most of interviewees shown their need to a clear explanation of the illness and full medical instruction.
- ✚ Most of interviewees are satisfied with the available information that accurately documented.

#### **Theme four: Responsiveness**

According to this theme which is related to the flexibility of response, most of interviewees mentioned the wasting of time through long hours waiting until the service is performed. Furthermore, they asserted to the necessity of prompt response to their requests and taking immediately actions in emergent cases consequently; readability and willingness to help are highly needed.

#### **Theme five: Assurance**

According to this theme which is related to the medical staff behavior and attitude, all interviewees emphasized the significant effect of the staff interaction and attitudes toward them which is considered as a half of the treatment as well as instilling confidence and trust. On the other hand, some of them mentioned the unfriendly treatment of the staff in Gaza hospitals towards patients as being tough with them instead of respect.

Moreover, most of interviewees declared that the secure and confidence come from the staffs' answers on patients' questions which revealed the wide knowledge they have as well as their skills in performing the service.

### **Theme six: Empathy**

According to this theme that is related to the care and attention to patients, interviewees expressed that as follows:

- ✚ All interviewees highly agreed on the limited emotional and psychosocial support.
- ✚ All interviewees argued on the necessity of paying attention to their feelings and pains.
- ✚ All of them declared that the kindness of the staff played a specific role in encouraging patients to continue.
- ✚ Most of interviewees indicated that the fun events and entertainment activates that support and recreate the patients are also limited so they felt bored specially children.
- ✚ Most of interviewees argued about the absence of complaint handling and solving their needs seriously.

### **4.3 Questionnaire Analysis**

Based on the data obtained from the quantitative survey developed for patients in order to assess the hospitals' service quality performance and

importance from the patients' point of view, many statistical descriptive tests have been used to find out descriptive statistical analysis that help in answering the research questions.

On the whole, a specific number of questionnaires were distributed in several governmental hospitals which selected from different trends and locations located in West Bank, Gaza and Dubai for the purpose of competitive benchmarking. Accordingly, the 291 valid questionnaires have been analyzed and divided into three groups resulted in 140 patients in West Bank which represent the **first group** in the analysis, while 55 out of 291 treated in Gaza and called the **second group** and 96 patients treated in Dubai called the **third group** in the analysis. Table (1) in Appendix B shows the details of participants in each hospital, Figure (4.1) shows the distribution of participants by regions in this research.

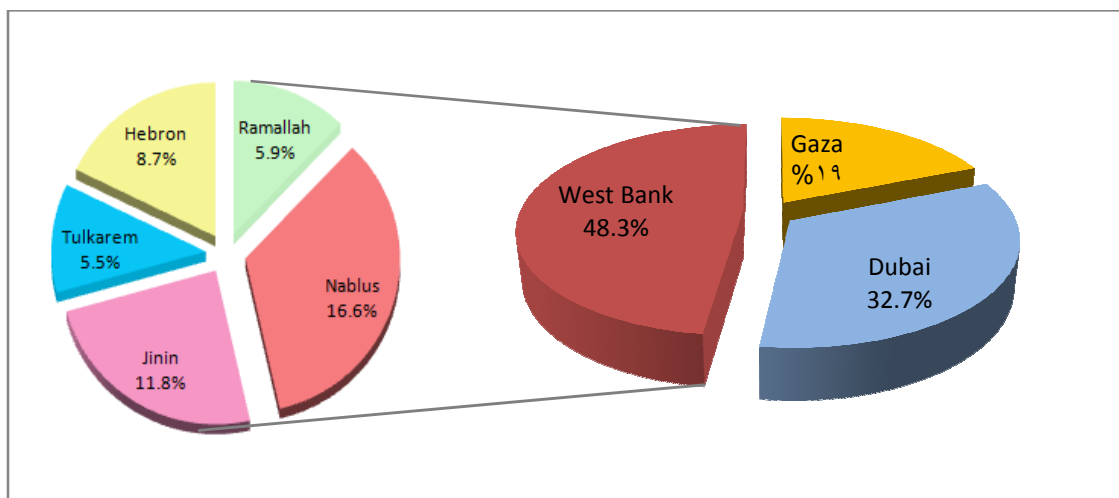
#### **4.3.1 Demographic and Descriptive Statistics**

The participants varied in term of personal characteristics such as: location, gender, age, education level, having a job, monthly income, hemoglobin level and ferritin level that affect the patient's health status. The following figures show these personal characteristics distribution for the three groups in this research.

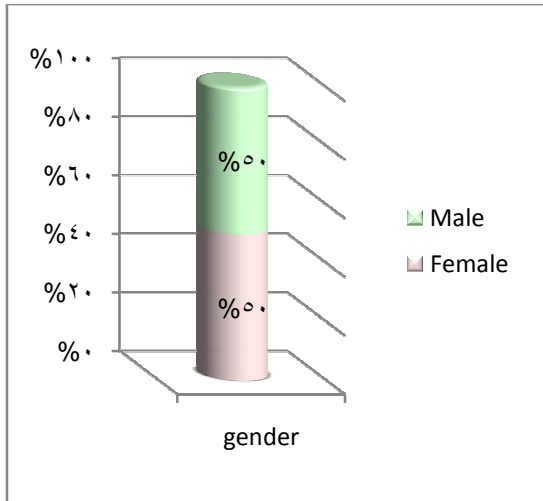
##### **First group: West Bank**

The results of the analysis of personal characteristics data as shown below in Figure (4.1) represents the distribution of WB participants'

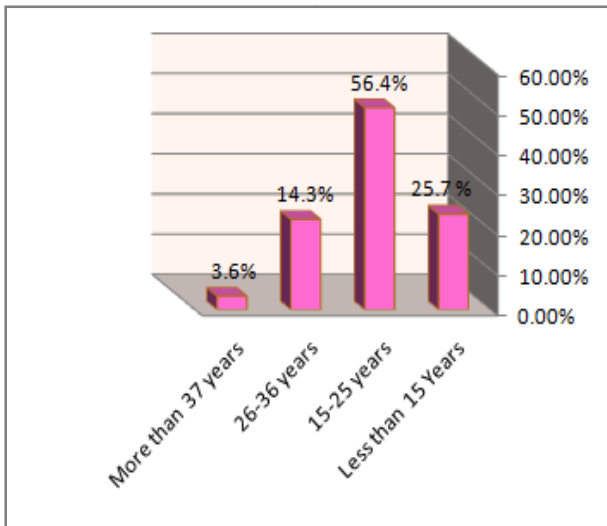
patients based on location, most of the patients 16.6% are located in Nablus city. It also shows that 11.8% of the patients are located in Jenin, 8.7% are located in Hebron and 5.9% located in Ramallah while only 5.5% of the patients are located in Tulkarem. Further, the following figures {(4.2) to (4.8)} illustrate WB hospitals patients are equal; 50% are females and 50% are males, and 56.4% of participants are adults aging between 15 -25 years old. In addition, about 83.9% of patients are jobless with 42.1% has primary degree, 26.4% has secondary degree while 17.9% and 13.6% has B.A and Diploma degree respectively. Also, 43.6% their monthly income between 1500-3000 NIS and 40.7% under 1500 NIS while only 15.7% more than 3000 NIS. Overall a majority of survey respondents rated their health status as being fair with 66.4% their hemoglobin level between [7.1- 8.9], 17.9% less than 7, while 12.9% between [9.0- 10.9] and only 2.9% more than 11. Furthermore, 46.4% their ferritin level between [1000 -2999], 22.9% between [3000-4999], 16.4% less than 1000 while 14.3% more than 5000.



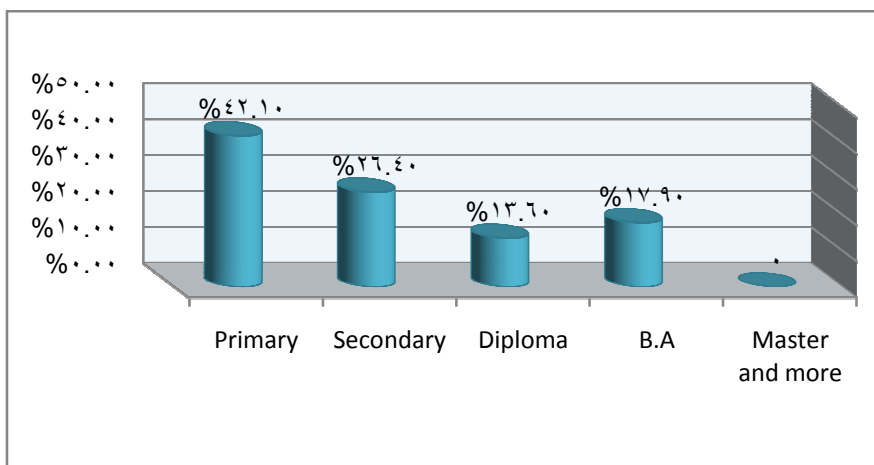
**Figure (4.1): Distribution of Hospital Location**



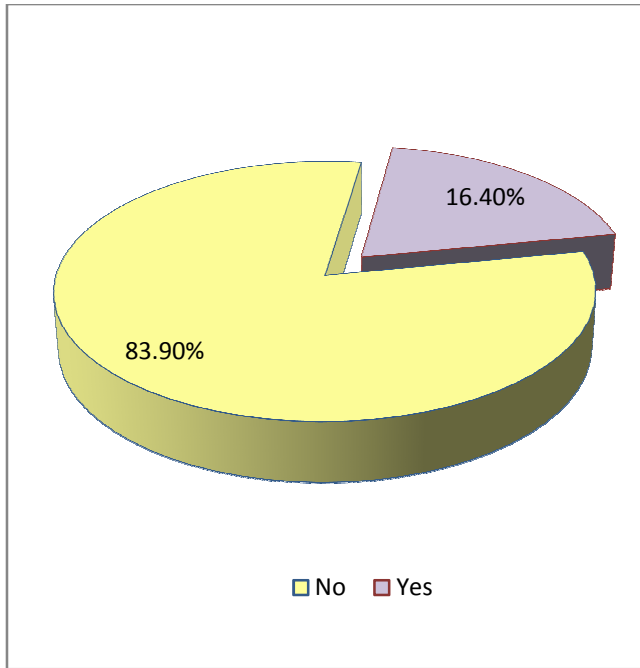
**Figure (4.2): Distribution of Gender in WB**



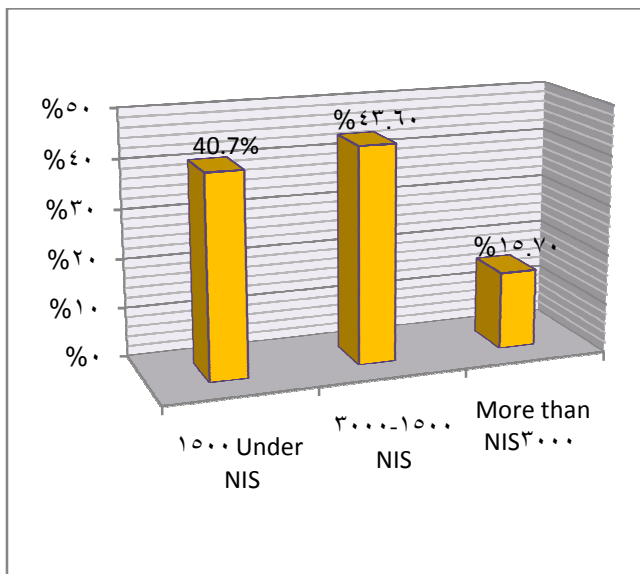
**Figure (4.3): Distribution of Age in WB**



**Figure (4.4): Distribution of Educational Level in WB**

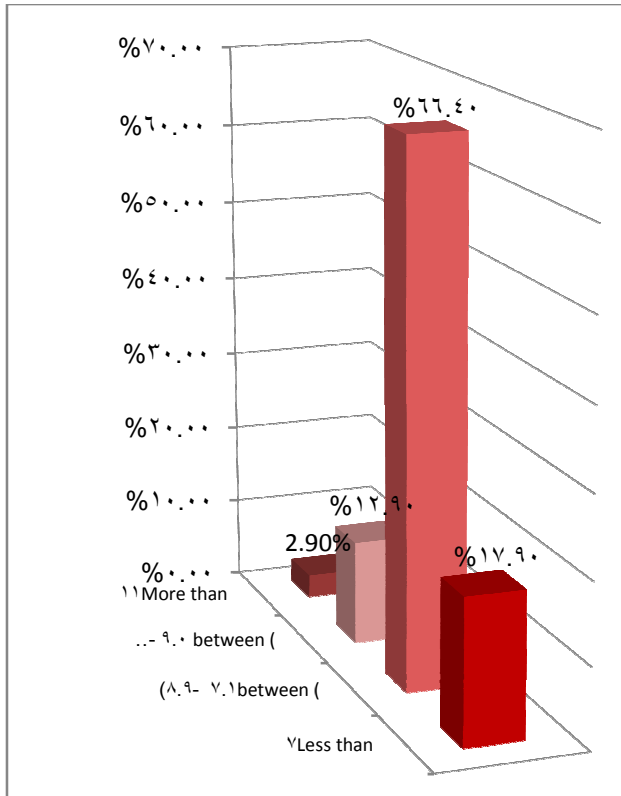


**Figure (4.5): Distribution of Having a Job in WB**

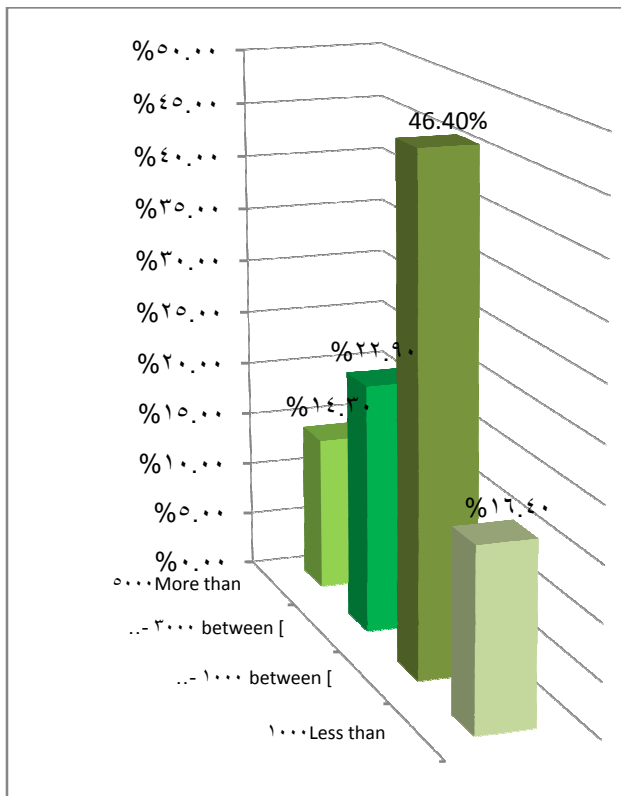


**Figure (4.6): Distribution of Monthly Income in WB**





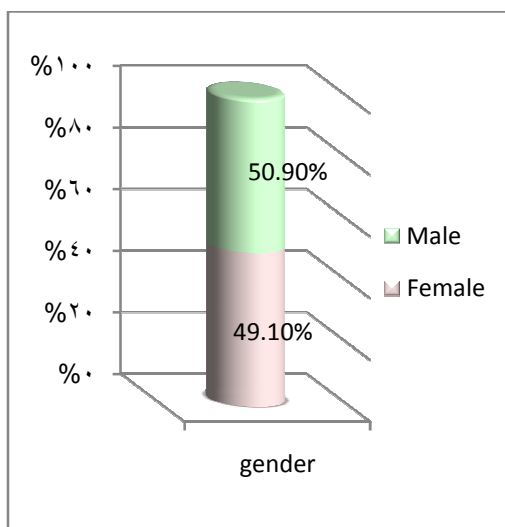
**Figure (4.7): Distribution of Hemoglobin Level in WB**



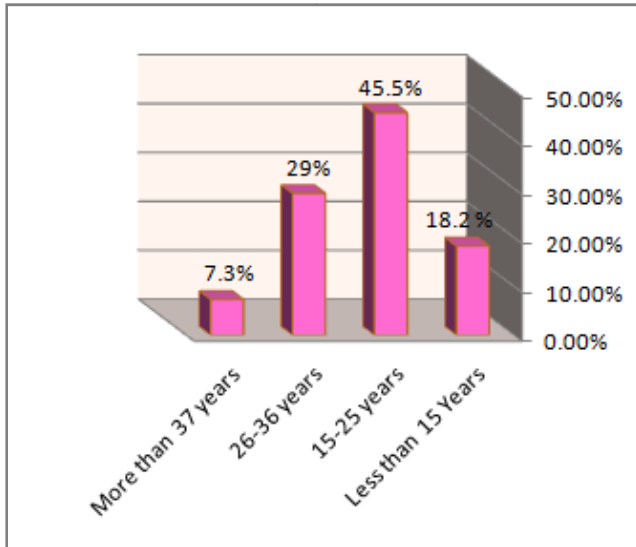
**Figure (4.8): Distribution of Ferritin Level in WB**

## Second group: Gaza

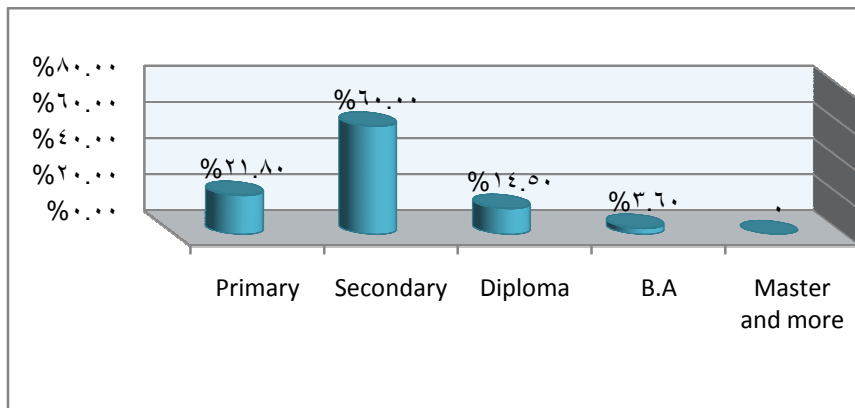
The results of the analysis personal characteristics data as shown in following Figures {(4.9) to (4.15)} illustrate those GS hospitals patients are males who form 50.9% of respondents while 49.1% are females and 45.5% of participants are adults aging between 15 -25 years old. In addition, about 85.5% of patients are jobless with 60% has secondary degree, 21.8% has primary degree while 14.5% has Diploma and only 3.6% has B.A degree. Also, 49% their monthly income under 1500 NIS and 45.5% between 1500-3000 NIS while only 5.5% more than 3000 NIS. Overall a majority of survey respondents rated their health status as being somewhat fair with 61.8% their hemoglobin level between [7.1- 8.9], 30.9% between [9.0- 10.9], while only 5.5% less than 7 and 1.8% more than 11. Furthermore, the majority of GS patients rated their ferritin level as being poor with 43.6% between [3000-4999] and 34.5% more than 5000, while 14.5% between [1000 -2999] and only 7.4% less than 1000.



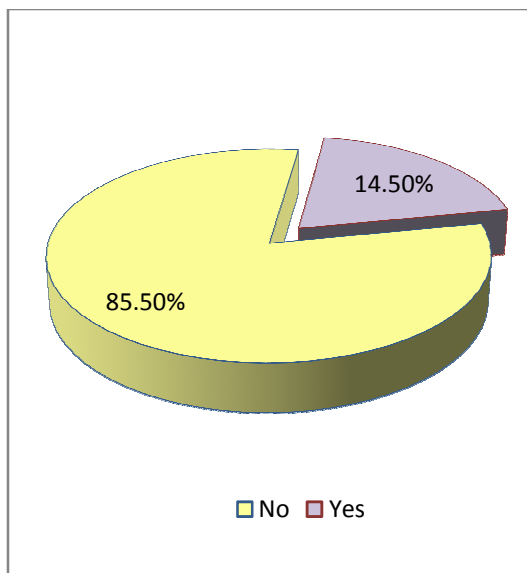
**Figure (4.9): Distribution of Gender in GS**



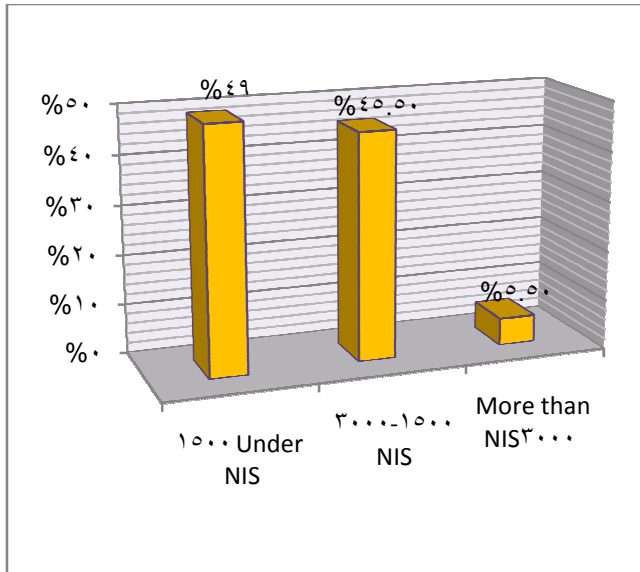
**Figure (4.10): Distribution of Age in GS**



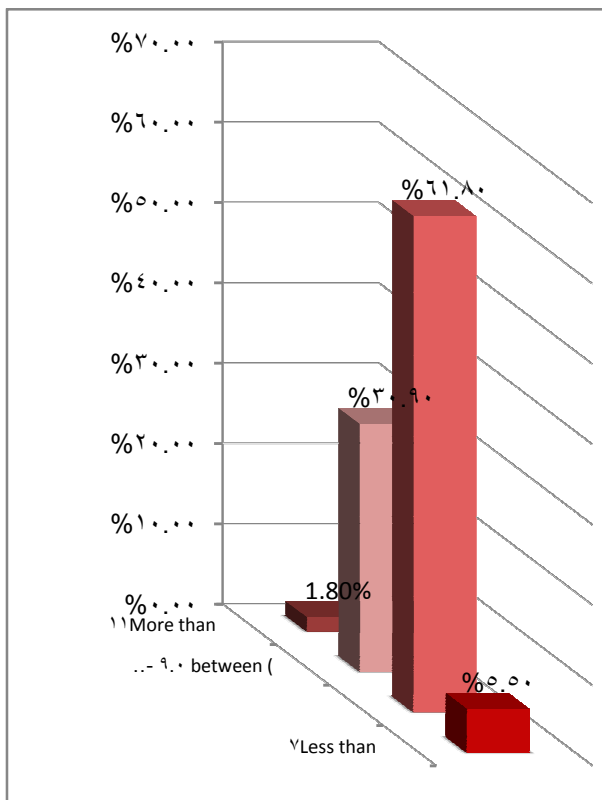
**Figure (4.11): Distribution of Educational Level in GS**



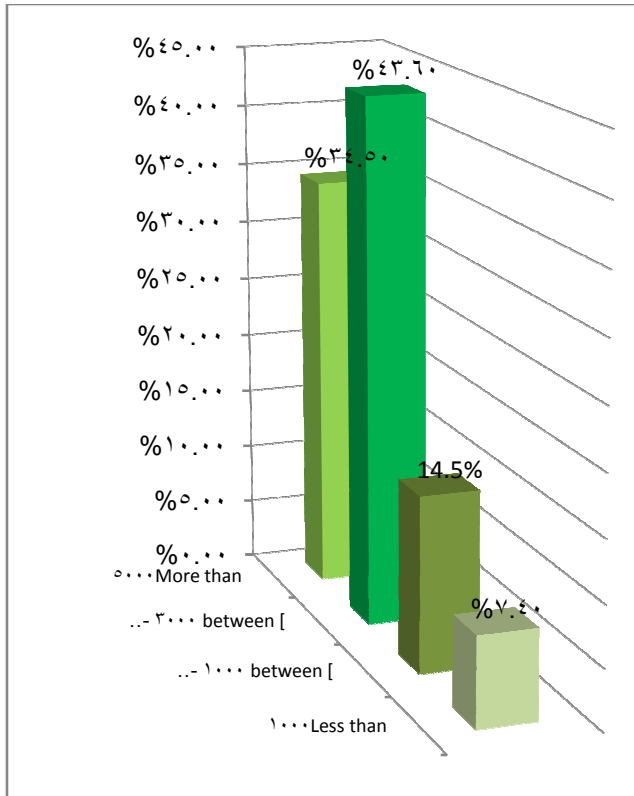
**Figure (4.12): Distribution of Having a Job in GS**



**Figure (4.13): Distribution of Monthly Income in GS**



**Figure (4.14): Distribution of Hemoglobin Level in GS**

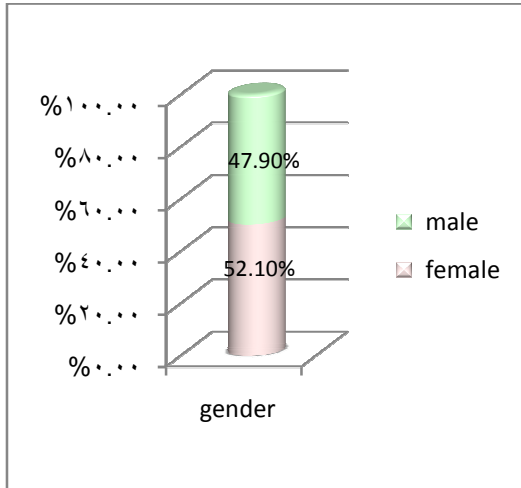


**Figure (4.15): Distribution of Ferritin Level in GS**

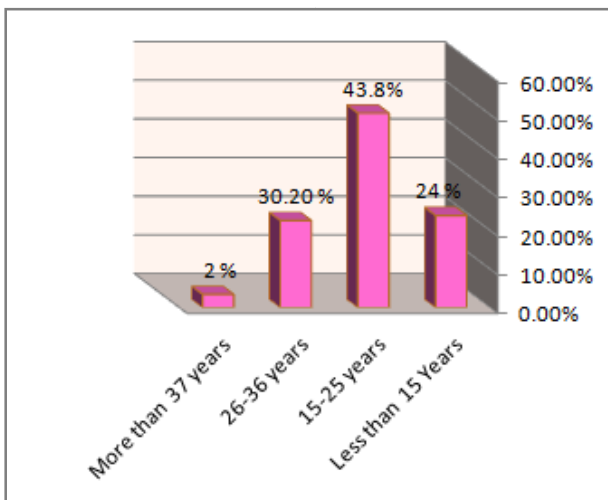
### **Third group: Dubai**

The results of the analysis personal characteristics data as shown in following Figures {(4.16) to (4.22)} illustrate that Dubai hospital patients are females who form 52.1% of respondents while 47.9% are male and 43.8% of participants are adults aging between 15 -25 years old. In addition, about 72.9% of patients are jobless with 46.9% has secondary degree, 27.1% has primary degree while 13.5% and 12.5% has B.A and Diploma degree respectively. In addition, 41.5%, 34.4% of the participants their monthly income between 5000-15000 AED and more than 15000 AED respectively. Overall a majority of survey respondents rated their health status as being good with 63.5% their hemoglobin level between [9.0- 10.9] while only 4.2% less than 7. Further, 51% their ferritin level

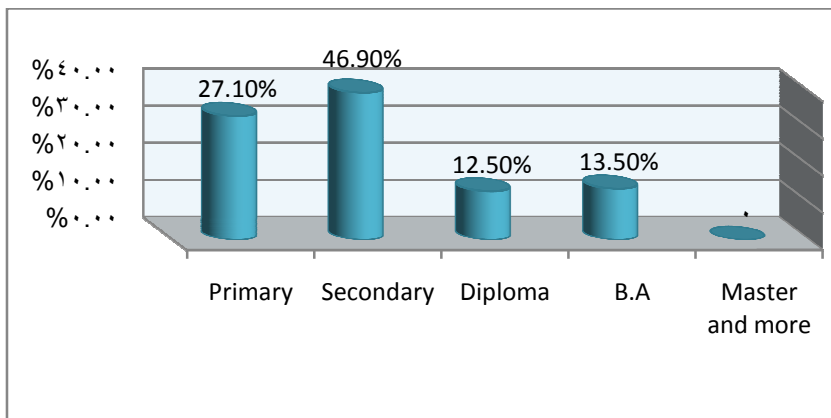
between [1000 -2999], 27.1% less than 1000, 16.7% between, [3000-4999] and only 5.2% more than 5000 which is somewhat acceptable.



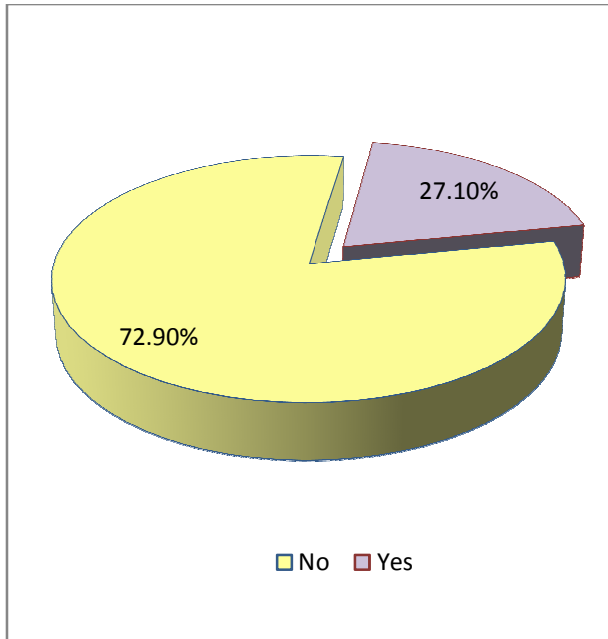
**Figure (4.16): Distribution of Gender in DB**



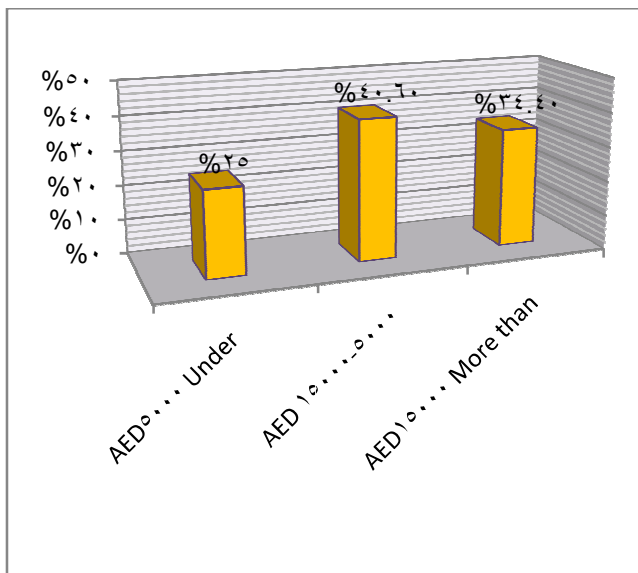
**Figure (4.17): Distribution of Age in DB**



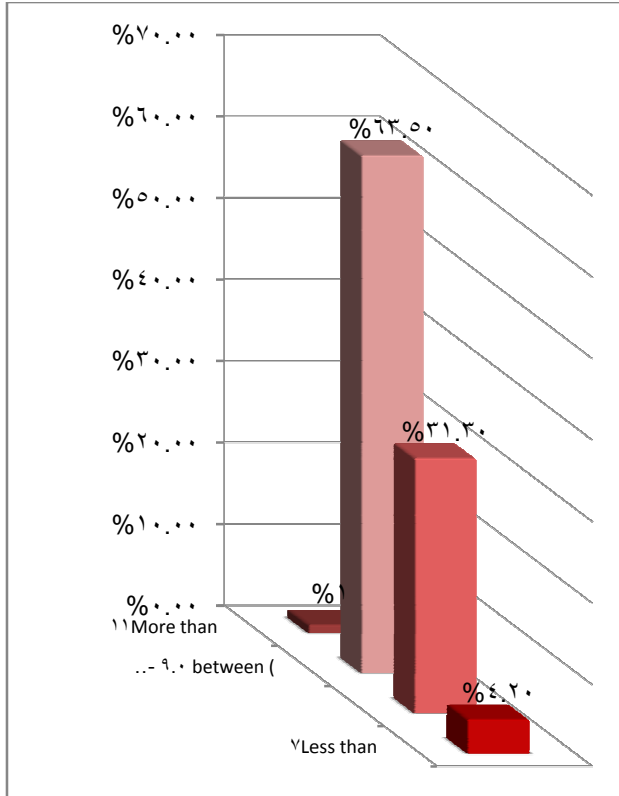
**Figure (4.18): Distribution of Educational Level in DB**



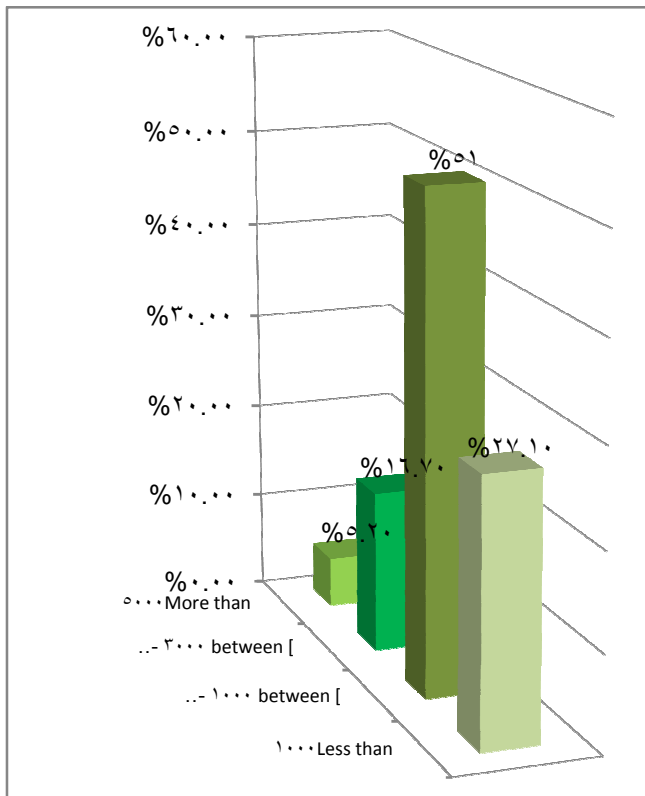
**Figure (4.19): Distribution of Having a Job in DB**



**Figure (4.20): Distribution of Monthly Income in DB**



**Figure (4.21): Distribution of Hemoglobin Level in DB**



**Figure (4.22): Distribution of Ferritin Level in DB**



### **4.3.2 Measuring the Hospitals' Service Quality Performance and the Relative Importance along the SERVQUAL Dimensions**

As previously mentioned the survey was conducted in order to assess the hospitals' quality performance along the SERVQUAL dimensions as perceived by patients and identify strengths and detect weaknesses of hospitals' performance through benchmarking the best practices among competitors. From questionnaire responses, a clear image about the reality of the medical services provided to thalassemia patients within different hospitals is obtained. Moreover, the most influential dimensions on health service quality can be easily determined. On the other hand, since hospitals have limited resources, it is often necessary for a hospital to be selective in the choice of patient requirements it wishes to meet at any time. However, not all requirements are equally important to the patients. Therefore, it is necessary to prioritize these requirements systematically. Consequently, in order to analyze the responses, the means, the standard deviations, and the estimation levels are calculated; the main findings for the three main groups, WB, GS and Dubai, are shown below:

#### **First group: West Bank**

Respondents were asked to rate the main requirements of medical services in their respective dimensions on a five-point scale, with 5 being “Strongly Agree” and 1 being “Strongly Disagree” according to the degree of their satisfaction and agreement about the service quality performance at West Bank hospitals. Table 4-2 presents the total mean ratings of the WB

hospitals' quality performance and importance along the SERVQUAL dimensions. Tables (10) and Table (11) in Appendix B outline the descriptive analysis of all patients' requirements (each dimension and individual statement) under their related group.

**Table (4-2): Mean level of the WB hospitals' quality performance and importance along the SERVQUAL dimensions**

| No           | SERVEQUAL dimensions           | Performance |             |              |                  | Importance  |             |              |      |
|--------------|--------------------------------|-------------|-------------|--------------|------------------|-------------|-------------|--------------|------|
|              |                                | Means       | SD          | Percentage % | Estimation Level | Means       | SD          | Percentage % | Rank |
| 1            | Availability and Accessibility | 3.57        | 0.68        | 71.4%        | High             | 4.57        | 0.55        | 91.4%        | 1    |
| 2            | Tangibility                    | 3.76        | 0.80        | 75.2%        | High             | 4.34        | 0.58        | 86.8%        | 6    |
| 3            | Reliability                    | 3.56        | 0.83        | 71.2%        | High             | 4.46        | 0.55        | 89.2%        | 4    |
| 4            | Responsiveness                 | 3.49        | 0.90        | 69.8%        | High             | 4.56        | 0.60        | 91.2%        | 2    |
| 5            | Assurance                      | 3.69        | 0.88        | 73.8%        | High             | 4.51        | 0.55        | 90.2%        | 3    |
| 6            | Empathy                        | 3.21        | 1.11        | 64.2%        | Moderate         | 4.37        | 0.69        | 87.4%        | 5    |
| <b>Total</b> |                                | <b>3.54</b> | <b>0.74</b> | <b>70.9%</b> | <b>High</b>      | <b>4.47</b> | <b>0.46</b> | <b>89.4%</b> |      |

From the summary of the result in Table 4-2 above, the total degree for the quality performance of medical services provided to the thalassemia patients at WB hospitals was (3.54) which suggest as a moderate to high levels of estimation. It can be observed that the "Tangibility" has the highest mean equals (3.76) regarding to the WB hospitals' quality performance along the SERVQUAL dimensions. The second one was "Assurance" with a mean equals (3.69), followed by "Availability and Accessibility" with the mean equals (3.57) in third place and "Reliability" with the mean equals (3.56) in fourth place. The least two places for "responsiveness" with a mean equals (3.49) while the "Empathy" has the lowest mean equals (3.21).

On the other hand, based on the responses as shown in Table 4-2, almost all of the requirements of medical services are important from patients' point of view and have a mean rating greater than 3 on the five-point scale, but it is worth to notice that the mean rating is very close. "Availability and Accessibility" was ranked first as the most important quality dimension for patients with mean equals (4.57). Closely followed by "Responsiveness" with a mean equals (4.56). "Assurance" in third place which scored (4.51), in the time "Reliability" took fourth place with the mean equals (4.46). The least two places were for Empathy" with a mean equals (4.37), followed by "Tangibility" with the lowest mean scored (4.34).

### **Second group: Gaza**

Respondents were asked to rate the main requirements of medical services in their respective dimensions on a five-point scale, with 5 being "Strongly Agree" and 1 being "Strongly Disagree" according to the degree of their satisfaction and agreement about the service quality performance in Gaza hospital. Table 4-3 presents the total mean ratings of the GS hospital's quality performance and importance along the SERVQUAL dimensions. Tables (12) and (13) in Appendix B outline the descriptive analysis of all patients' requirements (each dimension and individual statement) under their related group.

**Table (4-3): Mean level of the GS hospitals' quality performance and importance along the SERVQUAL dimensions**

| No    | SERVEQUAL dimensions           | Performance |      |              |                  | Importance |      |              |      |
|-------|--------------------------------|-------------|------|--------------|------------------|------------|------|--------------|------|
|       |                                | Means       | SD   | Percentage % | Estimation Level | Means      | SD   | Percentage % | Rank |
| 1     | Availability and Accessibility | 2.43        | 0.63 | 48.6%        | Low              | 4.63       | 0.75 | 92.6%        | 1    |
| 2     | Tangibility                    | 2.77        | 0.66 | 55.4%        | Moderate         | 4.43       | 0.51 | 88.6%        | 2    |
| 3     | Reliability                    | 2.68        | 0.50 | 53.6%        | Moderate         | 4.16       | 0.59 | 83.2%        | 3    |
| 4     | Responsiveness                 | 2.88        | 0.53 | 57.6%        | Moderate         | 4.12       | 0.68 | 82.4%        | 4    |
| 5     | Assurance                      | 2.92        | 0.58 | 58.4%        | Moderate         | 4.01       | 0.66 | 80.2%        | 6    |
| 6     | Empathy                        | 2.64        | 0.78 | 52.8%        | Moderate         | 4.03       | 0.86 | 80.6%        | 5    |
| Total |                                | 2.72        |      | 54.4%        | Moderate         | 4.23       |      | 84.6%        |      |

From the summary of the result in Table 4-3 above, the total degree for the quality performance of medical services provided to the thalassemia patients at GS hospital was (2.72). It can be observed that the "Assurance" has the highest mean equals (2.92) regarding to the GS hospital's quality performance along the SERVQUAL dimensions. The second one was "Responsiveness" with a mean equals (2.88), followed by "Tangibility" with the mean equals (2.77) in third place and "Reliability" with the mean equals (2.68) in fourth place. The least two places for "Empathy" with a mean equals (2.64) while the "Availability and Accessibility" has the lowest mean equals (2.43).

On the other hand, based on the responses as shown in Table 4-3, almost all of the requirements of medical services are important from patients' point of view and have a mean rating greater than 3 on the five-point scale. "Availability and Accessibility" was ranked first as the most important quality dimension for patients with mean equals (4.63). Followed

by “Tangibility” with a mean equals (4.43). “Reliability” in third place which scored (4.16), in the time “Responsiveness” took fourth place with the mean equals (4.12). The least two places were for "Empathy” with a mean equals (4.03), followed by “Assurance” with the lowest mean scored (4.01).

### **Third group: Dubai**

Respondents were asked to rate the main requirements of medical services in their respective dimensions on a five-point scale, with 5 being “Strongly Agree” and 1 being “Strongly Disagree” according to the degree of their satisfaction and agreement about the service quality performance in Dubai hospital. Table 4-4 presents the total mean ratings of the Dubai hospital's quality performance and importance along the SERVQUAL dimensions. Tables (14) and (15) in Appendix B outline the descriptive analysis of all patients' requirements (each dimension and individual statement) under their related group.

From the summary of the result in Table 4-4 above, the total degree for the quality performance of medical services provided to the thalassemia patients at Dubai hospital was (4.60) which shows a very high level of estimation where almost all of the requirements of medical services are highly ranked in case of performance from patients' point of view, also it is worth to notice that the mean rating is very close. It can be observed that the "Assurance" has the highest mean equals (4.69) regarding to the Dubai hospital's quality performance along the SERVQUAL dimensions.

**Table (4-4): Mean level of the DB hospitals' quality performance and importance along the SERVQUAL dimensions**

| No    | SERVEQUAL dimensions           | Performance |      |              |                  | Importance |      |              |      |
|-------|--------------------------------|-------------|------|--------------|------------------|------------|------|--------------|------|
|       |                                | Means       | SD   | Percentage % | Estimation Level | Means      | SD   | Percentage % | Rank |
| 1     | Availability and Accessibility | 4.61        | 0.55 | 92.2%        | Very High        | 4.51       | 0.45 | 90.2%        | 3    |
| 2     | Tangibility                    | 4.61        | 0.56 | 92.2%        | Very High        | 4.31       | 0.63 | 86.2%        | 6    |
| 3     | Reliability                    | 4.57        | 0.61 | 91.4%        | Very High        | 4.48       | 0.57 | 89.6%        | 5    |
| 4     | Responsiveness                 | 4.56        | 0.64 | 91.2%        | Very High        | 4.60       | 0.46 | 92%          | 2    |
| 5     | Assurance                      | 4.69        | 0.58 | 93.8%        | Very High        | 4.61       | 0.57 | 92.2%        | 1    |
| 6     | Empathy                        | 4.60        | 0.59 | 92%          | Very High        | 4.50       | 0.59 | 90%          | 4    |
| Total |                                | 4.60        |      | 92%          | Very High        | 4.50       |      | 90%          |      |

The second two dimensions were "Tangibility" and "Availability and Accessibility" with a mean equals (4.61), closely followed by "Empathy" with the mean equals (4.60) in third place and "Reliability" with the mean equals (4.57) in fourth place while the "Responsiveness" has the lowest mean equals (4.56).

On the other hand, based on the responses as shown in Table 4-4, almost all of the requirements of medical services are important from patients' point of view and have a mean rating greater than 3 on the five-point scale, but it is worth to notice that the mean rating is very close. "Assurance" was ranked first as the most important quality dimension for patients with mean equals (4.61). Closely followed by "Responsiveness" with a mean equals (4.60). "Availability and Accessibility" in third place which scored (4.51), in the time "Empathy" took fourth place with the mean equals (4.50). The least two places were for "Reliability" with a mean equals (4.48), followed by "Tangibility" with the lowest mean scored (4.31).

### 4.3.3 Statistical Differences among Survey Respondents

This section outlines the statistical differences between participants according to their personal characteristics for the three groups in this research. Independent Samples Test (t-test for Equality of Means) and One-way ANOVA Test are used to explain these differences if they are presented; these two tests are used because correlations between qualitative and quantitative factors will be tested.

#### **First group: West Bank**

The results in Table 4-5 show that there are no statistical significant differences between participants according to their: gender, age, education level, having a job, monthly income, hemoglobin level and ferritin level in recognizing all factors affecting the quality *performance* of medical service where (P-value  $\geq$  0.05). In contrast, statistical differences between participants only appear in their location were (P-value  $<$  0.05). On the other hand, there are no statistical significant differences between participants according to their: gender, age, education level, having a job and hemoglobin level in recognizing all factors affecting the *importance* rating of medical service where (P-value  $\geq$  0.05), while there are statistical differences between participants according to their location, monthly income and ferritin level were (P-value  $<$  0.05).

**Table (4-5): Summarized T- Test and ANOVA Test for personal characteristics Differences among Participants in WB**

| Variables        | Performance |        | Importance |        |
|------------------|-------------|--------|------------|--------|
|                  | T           | Sig.   | t          | Sig.   |
| Gender           | -1.024      | 0.308  | - 0.426    | 0.671  |
| Having a job     | 0.039       | 0.969  | - 1.695    | 0.092  |
| Variables        | F           | Sig.   | F          | Sig.   |
| Location         | 17.01       | 0.000* | 3.517      | 0.009* |
| Age              | 1.903       | 0.132  | 1.364      | 0.257  |
| Education level  | 0.602       | 0.615  | 0.957      | 0.415  |
| Monthly income   | 1.113       | 0.332  | 3.610      | 0.030* |
| Hemoglobin level | 1.694       | 0.171  | 0.545      | 0.652  |
| Ferritin level   | 0.744       | 0.528  | 3.639      | 0.015* |

\* The mean difference is significant at the  $\alpha = 0.05$  level

The results from the one-way ANOVA test do not indicate which of the groups differ from one another. To understand the differences, LSD test for post hoc comparisons was conducted to test variation between the groups.

According to the **location**, ANOVA and LSD tests show the participants who located in Tulkarem have the highest percentage toward perceived factors affecting the quality performance of medical service and more satisfied (mean equals 4.26) than who located in Nablus, Ramallah and Jenin (mean respectively 3.72, 3.62 and 3.50), whereas participants who located in Hebron have the lowest percentage toward perceived factors affecting the quality performance of medical service and the least satisfied (mean equals 2.75). (Appendix B: Table (5)). On the other hand, ANOVA and LSD test shows the participants who located in Nablus and Hebron have the highest percentage toward perceived importance of the factors affecting the quality of medical service (mean respectively 4.59 and 4.54)



than who located in Tulkarem and Ramallah (mean respectively 4.51 and 4.43). Whereas participants who located in Jenin have the lowest percentage toward perceived importance of the factors affecting the quality of medical service (mean equals 4.23) (Appendix B: Table (5)).

According to the **monthly income**, ANOVA and LSD tests show the participants whose monthly income under 1500 NIS have the highest percentage toward perceived importance of the factors affecting the quality of medical service (mean equals 4.57), whereas the participants whose their monthly income between 1500- 3000 NIS and more than 3000 NIS (mean respectively 4.35 and 4.52) have the lowest percentage toward perceived importance of the factors affecting the quality of medical service (Appendix B: Table (6)).

According to the **ferritin level**, ANOVA and LSD tests show that the participants having ferritin levels more than 5000 have the highest percentage toward perceived importance of the factors affecting the quality of medical service (mean equals 4.69) than who have ferritin levels less than 1000 and between [1000- 2999] (mean respectively 4.60 and 4.42), whereas participants who have ferritin levels between [3000- 4999] have the lowest percentage toward perceived importance of the factors affecting the quality of medical service (mean equals 4.32) (Appendix B: Table (7)).

### **Second group: Gaza**

The results in the following Table 4-6 show that there are no statistical significant differences between participants according to their:

gender, age, education level, having a job and ferritin level in recognizing all factors affecting the quality *performance* of medical service where (P-value  $\leq$  0.05) for all. While there are statistical differences between participants according to their hemoglobin level and monthly income were (P-value  $<$  0.05). On the other hand, there are no statistical significant differences between participants according to their: gender, age, education level, having a job, monthly income and ferritin level in recognizing all factors affecting the *importance* rating of medical service where (P-value  $\leq$  0.05). However, statistical differences between participants only appear in the hemoglobin level were (P-value  $<$  0.05).

**Table (4-6): Summarized T- Test and ANOVA Test for personal characteristics Differences among Participants in GS**

| Variables        | Performance |        | Importance |        |
|------------------|-------------|--------|------------|--------|
|                  | t           | Sig.   | T          | Sig.   |
| Gender           | -1.085      | 0.283  | - 0.661    | 0.511  |
| Having a job     | -0.452      | 0.653  | 1.035      | 0.305  |
| Variables        | F           | Sig.   | F          | Sig.   |
| Age              | 1.001       | 0.400  | 0.532      | 0.662  |
| Education level  | 0.253       | 0.859  | 0.416      | 0.742  |
| Monthly income   | 4.855       | 0.012* | 1.864      | 0.165  |
| Hemoglobin level | 4.110       | 0.011* | 5.792      | 0.002* |
| Ferritin level   | 1.038       | 0.384  | 1.574      | 0.207  |

\* The mean difference is significant at the  $\alpha = 0.05$  level

To understand the differences, LSD test for post hoc comparisons was conducted to test variation between the groups.

According to the **monthly income**, ANOVA and LSD tests show the participants having monthly incomes more than 3000 NIS have the highest percentage toward perceived factors affecting the quality performance of

medical service and more satisfied (mean equals 3.46) than having monthly income between 1500- 3000 NIS and under 1500 NIS (mean respectively 2.74 and 2.61) (Appendix B: Table (8)).

According to the **hemoglobin level**, ANOVA and LSD test shows the one participant who their hemoglobin level more than 11 and formed this variance; has the highest percentage toward perceived factors affecting the quality performance of medical service and more satisfied (mean equals 4.23) than who their hemoglobin levels between [7.01- 8.9] and between [9.0- 10.9] (mean respectively 2.66 and 2.77), whereas participants who their hemoglobin levels less than 7 have the lowest percentage toward perceived factors affecting the quality performance of medical service and the least satisfied (mean equals 2.57) (Appendix B: Table (9)). On the other hand, ANOVA and LSD test shows the one participant who their hemoglobin level more than 11 has the lowest percentage toward perceived importance of the factors affecting the quality of medical service (mean equals 2.55). Whereas participants who their hemoglobin levels less than 7 have the highest percentage toward perceived importance of the factors affecting the quality of medical service (mean equals 4.52) than who their hemoglobin levels between [7.01- 8.9] and between [9.0- 10.9] (mean respectively 4.21 and 4.32) (Appendix B: Table (9)).

### **Third group: Dubai**

The results in Table 4-7 shows that there are no statistical significant differences between participants according to their: gender, age, education

level, having a job, monthly income, hemoglobin level and ferritin level in recognizing all factors affecting the quality *performance* and *importance* rating of medical service where (P-value  $\leq$  0.05) for all.

**Table (4-7): Summarized T- Test and ANOVA Test for personal characteristics Differences among Participants in DB**

| Variables        | Performance |       | Importance |       |
|------------------|-------------|-------|------------|-------|
|                  | T           | Sig.  | t          | Sig.  |
| Gender           | -0.288      | 0.774 | - 0.631    | 0.529 |
| Having a job     | 0.281       | 0.779 | - 0.671    | 0.504 |
| Variables        | F           | Sig.  | F          | Sig.  |
| Age              | 0.223       | 0.880 | 0.906      | 0.441 |
| Education level  | 0.155       | 0.926 | 0.521      | 0.669 |
| Monthly income   | 2.319       | 0.104 | 2.314      | 0.105 |
| Hemoglobin level | 0.255       | 0.858 | 1.530      | 0.212 |
| Ferritin level   | 2.201       | 0.093 | 1.997      | 0.120 |

\* The mean difference is significant at the  $\alpha = 0.05$  level

The following points summarize the most important results that have been obtained above:

- The results show that there are no statistical significant differences between participants according to their: gender, age, education level and having a job in all targeted hospitals; whereas all medical services provided equitably for all patients at the same level without any discrimination.
- Regarding to the results, there are statistical differences between hospitals in WB according to their locations, it can be assumed that, though all hospitals in WB are within the same geographical area and under the same political, and economical conditions, these differences may be due to the overloaded number of patients there and how to

concern in caring thalassemia and managing their requirements efficiently.

- Findings demonstrate that monthly income has effect on the assessment of quality performance and importance in WB and GS hospitals, these results are not surprising at all, frankly patients with low incomes are strongly caring to be provided by all the necessary services they needed since they can't be treated in private hospitals and centers to the point that some of them cannot afford the transportation costs.
- Findings illustrate that patient's health status has affected the assessment of quality performance and importance in WB and GS hospitals, while patients with lower hemoglobin level and higher ferritin level may be lead to severe complications required frequent admissions to hospital thus let patients highly sought the problems occurred while receiving their services so caused more dissatisfaction. This result is consistent with findings at Sharif (2008) who showed that patients with poor health were more dissatisfied.

#### **4.3.4 Correlation Analysis**

In order to determine if there is a significant relationship between the factors and whether they influence the performance quality of medical services provided at hospitals; the questionnaires responses are analyzed in accordance with the research. For this purpose, Pearson Correlation Matrix is used. The results of Pearson Correlation value ( $\rho$ ) and the significant

value (P-value) between the study factors for the three groups are shown below:

**First group: West Bank**

The following Table 4-8 shows the test results which represent the correlation among six SERVQUAL dimensions: (1) Availability & Accessibility (AA), (2) Tangibility (T), (3) Reliability (RL), (4) Responsiveness (RS), (5) Assurance (AS), and (6) Empathy (E). The results of Pearson's correlation coefficient test show that SERVQUAL dimensions have a significant correlation with each other since all of the P-values are below  $\alpha = 0.05$ . These correlations can be described as positively strong since all of the Pearson correlation coefficients is above  $\rho=0.5$ . Based on Pearson correlation analysis for first group [WB], the strongest relation is between Assurance and Reliability were ( $\rho=0.811$ ), on the other side, the weakest correlation is between Tangibility and Availability and Accessibility where ( $\rho=0.498$ ).

**Table (4-8): Pearson Correlation Matrix between the SERVQUAL dimensions for WB**

| Domain                                  |                     | T       | RL      | RS      | AS      | E       |
|-----------------------------------------|---------------------|---------|---------|---------|---------|---------|
| <b>Availability &amp; Accessibility</b> | Pearson Correlation | 0.498** | 0.709** | 0.658** | 0.549** | 0.579** |
|                                         | Sig. (2-tailed)     | 0.000   | 0.000   | 0.000   | 0.000   | 0.000   |
| <b>Tangibility</b>                      | Pearson Correlation |         | 0.673** | 0.555** | 0.638** | 0.673** |
|                                         | Sig. (2-tailed)     |         | 0.000   | 0.000   | 0.000   | 0.000   |
| <b>Reliability</b>                      | Pearson Correlation |         |         | 0.692** | 0.811** | 0.788** |
|                                         | Sig. (2-tailed)     |         |         | 0.000   | 0.000   | 0.000   |
| <b>Responsiveness</b>                   | Pearson Correlation |         |         |         | 0.668** | 0.725** |
|                                         | Sig. (2-tailed)     |         |         |         | 0.000   | 0.000   |
| <b>Assurance</b>                        | Pearson Correlation |         |         |         |         | 0.766** |
|                                         | Sig. (2-tailed)     |         |         |         |         | 0.000   |
| <b>Empathy</b>                          | Pearson Correlation |         |         |         |         |         |
|                                         | Sig. (2-tailed)     |         |         |         |         |         |

\*\* Correlation is significant at the 0.01 level (2-tailed)

\* Correlation is significant at the 0.05 level (2-tailed)

### Second group: Gaza

The results of Pearson's correlation coefficient test as shown in the following Table 4-9 show that SERVQUAL dimensions have a significant correlation with each other since all of the P-values are below  $\alpha = 0.05$ . These correlations can be described as positively strong since all of the Pearson correlation coefficients is above  $\rho=0.5$ . Based on Pearson correlation analysis for second group [GS], the strongest relation is between Reliability and Tangibility were ( $\rho=0.770$ ), on the other side, the

weakest correlation is between Assurance and Availability and Accessibility where ( $p=0.305$ ).

**Table (4-9): Pearson Correlation Matrix between the SERVQUAL dimensions for GS**

| Domain                                  |                     | T       | RL      | RS      | AS      | E       |
|-----------------------------------------|---------------------|---------|---------|---------|---------|---------|
| <b>Availability &amp; Accessibility</b> | Pearson Correlation | 0.373** | 0.415** | 0.310*  | 0.305*  | 0.531** |
|                                         | Sig. (2-tailed)     | 0.005   | 0.002   | 0.021   | 0.024   | 0.000   |
| <b>Tangibility</b>                      | Pearson Correlation |         | 0.770** | 0.508** | 0.623** | 0.543** |
|                                         | Sig. (2-tailed)     |         | 0.000   | 0.000   | 0.000   | 0.000   |
| <b>Reliability</b>                      | Pearson Correlation |         |         | 0.570** | 0.633** | 0.560** |
|                                         | Sig. (2-tailed)     |         |         | 0.000   | 0.000   | 0.000   |
| <b>Responsiveness</b>                   | Pearson Correlation |         |         |         | 0.737** | 0.634** |
|                                         | Sig. (2-tailed)     |         |         |         | 0.000   | 0.000   |
| <b>Assurance</b>                        | Pearson Correlation |         |         |         |         | 0.733** |
|                                         | Sig. (2-tailed)     |         |         |         |         | 0.000   |
| <b>Empathy</b>                          | Pearson Correlation |         |         |         |         |         |
|                                         | Sig. (2-tailed)     |         |         |         |         |         |

\*\* Correlation is significant at the 0.01 level (2-tailed)

\* Correlation is significant at the 0.05 level (2-tailed)

### Third group: Dubai

The results of Pearson's correlation coefficient test as shown in the following Table 4-10 show that SERVQUAL dimensions have a significant correlation with each other since all of the P-values are below  $\alpha = 0.05$ . These correlations can be described as positively strong since all of the



Pearson correlation coefficients is above  $\rho=0.5$ . Based on Pearson correlation analysis for third group [Dubai], the strongest relation is between Empathy and Assurance were ( $\rho=0.907$ ), on the other side, the weakest correlation is between Empathy and Availability and Accessibility where ( $\rho=0.778$ ).

Regarding to the results found positively strong correlation between all SERVQUAL dimensions with each other in all targeted hospitals; it can be assumed that, service providers can understand that focusing on any SERVEQUAL dimensions will help leverage the others which will result in a better quality performance of medical service. This approach helps to identify the priorities and which dimensions support each other; whereas working to improve one will cause to improve the other therefore the service development efficiency can be increased without duplicate effort.

**Table (4-10): Pearson Correlation Matrix between the SERVQUAL dimensions for DB**

| Domain                                  |                     | T       | RL      | RS      | AS      | E       |
|-----------------------------------------|---------------------|---------|---------|---------|---------|---------|
| <b>Availability &amp; Accessibility</b> | Pearson Correlation | 0.805** | 0.872** | 0.827** | 0.810** | 0.778** |
|                                         | Sig. (2-tailed)     | 0.000   | 0.000   | 0.000   | 0.000   | 0.000   |
| <b>Tangibility</b>                      | Pearson Correlation |         | 0.807** | 0.838** | 0.858** | 0.810** |
|                                         | Sig. (2-tailed)     |         | 0.000   | 0.000   | 0.000   | 0.000   |
| <b>Reliability</b>                      | Pearson Correlation |         |         | 0.848** | 0.830** | 0.821** |
|                                         | Sig. (2-tailed)     |         |         | 0.000   | 0.000   | 0.000   |
| <b>Responsiveness</b>                   | Pearson Correlation |         |         |         | 0.869** | 0.892** |
|                                         | Sig. (2-tailed)     |         |         |         | 0.000   | 0.000   |
| <b>Assurance</b>                        | Pearson Correlation |         |         |         |         | 0.907** |
|                                         | Sig. (2-tailed)     |         |         |         |         | 0.000   |
| <b>Empathy</b>                          | Pearson Correlation |         |         |         |         |         |
|                                         | Sig. (2-tailed)     |         |         |         |         |         |

\*\* Correlation is significant at the 0.01 level (2-tailed)

\* Correlation is significant at the 0.05 level (2-tailed)

#### 4.4 After-Study Interviews Analysis

Based on the after-study semi-structured interviews that conducted with ten professionals working in targeted hospitals in order to understand the factors related to each hospital's technical performance which have been grouped under four aspects: (1) Staffing, (2) Physical facilities, (3) Information, and (4) Care delivery, also to assist in obtaining a competitive benchmarking of hospitals from a technical perspective and identifying the difficulty or probability to improve the medical services, Table (16) in Appendix C shows the details of the specialists' viewpoints in each

hospital in an organized condensed manner. The major points of these interviews can be summarized as follows:

### **Aspect One; Staffing**

- ✚ According to the results, Dubai centre has the most qualified staff and the most careful of developing it by adopting several education courses and training programs. On the other hand, the qualification level of staff in Palestine is lower than Dubai. While Ramallah is the lowest; [Nablus, Hebron, and Gaza] seem good. As well as hospitals of [Nablus, Tulkarem, Jenin and Hebron] are capable to adopt some training programs but low in [Ramallah and Gaza].
- ✚ For the availability of multi-disciplinary doctors and enough full-time staff, in Dubai it is very high, e.g. there are seven hematologists and large number of staff nurses besides psychologist and social worker all working as a team. Similarly in Gaza there are five hematologists with 10-15 years experience but there is no psychologist or social worker. While most hospitals in West Bank argued that there is a shortage of hematologists besides no full-time doctors to the point that in needed cases a doctor has being called from other departments especially in [Jenin and Ramallah].
- ✚ Approximately 85.7% of targeted hospital setting mechanisms and roles to ensure staff accountability for mistakes; but a little low in Gaza. However, all interviewees in Palestine agreed that there are no incentives that play a considerable role in raising the motivation skills

level of the staff as involving them in decision making on the contrast it is better in Dubai.

- ✚ Regarding to the staff's behaviors and attitudes, all hospitals seen high but differ in their knowledge and communication skills.

### **Aspect Two; Physical facilities**

- ✚ According to the space size of the daycare units, it seems that Dubai is the largest one with 28 beds, while it is acceptable in [ Nablus, Tulkarem, Jenin, Ramallah] but in [ Hebron and Gaza ] need to be enlarged because it is crowded with patients sharing the same room with others e.g. oncology/ hemophilia patients.
- ✚ Most of interviewees indicated that the buildings structure and its layout conditions are high except in [Tulkarem, Hebron, and Gaza].
- ✚ The results show a high level of hygiene and cleanness of the facilities with excellent housekeeping except in Hebron.
- ✚ For the availability of equipments and supplies, modernity, accuracy rate and frequent maintenance; in Dubai it's very high while it is acceptable in some Palestinian hospitals and low in others.

### **Aspect Three; Information**

- ✚ According to the availability of information, there is a high quality documentation of medical records in all hospitals but lower in Gaza since there is limited use of a computerized information system especially in [Tulkarem, Jenin, and Gaza].

#### **Aspect Four; Care delivery**

- ✚ For the availability of blood units, most of interviewees declared that it is high, due to the awareness campaigns for voluntary blood donation. Moreover, they argued that a high level of storage capacity in quantities, safety conditions and accurate expiry date either in blood banks or medical warehouses.
- ✚ Regarding the availability of drugs, needed materials and medical consumables, some of interviewees indicated that the reliability of suppliers is acceptable. In addition, the pharmacy fill rate and monitoring the buffer stock of drugs differ from hospital to another; whereas it is high in [Dubai, Nablus, Tulkarem and Hebron]; it's low in [Ramallah and Gaza] where there is a shortage of medicines especially EXJADE to the degree that there is no EXJADE for many months in Gaza and if it's available just given to the children under 12 years besides lacks of DESFERAL bumps.
- ✚ The results show a high level of scheduling patients for treatments whereas the patients are heavily committed to the appointments of blood transfusion in West Bank hospitals, in contrast with Gaza is low. Furthermore, the routine monitoring of medical examinations and following up the patients' health are high in [Dubai and Nablus] but low in [Jenin, Ramallah, Gaza] since there is no full-time doctor in them and the priority for others oncology patients in Gaza.

- ✚ All interviewees mentioned that there are policies and clinical procedures for thalassemia in all hospitals but it is low in Gaza. Moreover, doctors in all hospitals are curious to follow correct protocols of treatments which help to develop the capacity for accurate diagnosis.
- ✚ The results show that the cost-effectiveness system is acceptable in most hospitals.
- ✚ Most of interviewees agreed that the workload of the staff is suitable in [Dubai, Nablus, Tulkarem, and Jenin] that can cover patients' needs while overloaded in [Hebron and Gaza].
- ✚ The existence of quality culture orientation is high in all hospitals but less in Gaza. Moreover, they are highly committed with safety and quality controls.
- ✚ The results show that the administrative procedures are high in [Dubai, Nablus, Tulkarem] but somewhat low in Ramallah.
- ✚ According to the staff response speed, Dubai is the highest and acceptable in [Nablus, Tulkarem, Jenin, and Gaza] but less in [Ramallah and Hebron].
- ✚ Most of interviewees agreed that all hospitals in Palestine lacked of a psychosocial support programs and entertainment activities to patients, in contrast with Dubai which is high.

# **Chapter Five**

## **QFD Model Development**

## **Chapter Five**

### **QFD Model Development**

#### **5.1 Chapter Overview**

This chapter presents the step-by-step development of the proposed QFD model and the construction of the conceptual HOQ matrices based on the results of the analysis. It also discusses the achieved results and puts the proposed model in practice to aid Palestinian healthcare organizations in planning process of quality improvement.

#### **5.2 Development of the proposed QFD model**

Based on the findings obtained from data analysis and observations within research environment; a clear image about the current situation of the medical services provided to thalassemia patients has been given. The study explored the problems that thalassemia patients' face and identified strengths/weaknesses that create gaps in medical service provision thus affecting hospitals' performance. It is indicated that the basic problems in health care organizations today are the great demand for more advanced health care for the patients, the existing inefficiencies in the health care delivery systems and the escalating costs of health care services as available resources are limited so an unsatisfactory medical care at the end. As a result of the above and in order to achieve the research goals and answer the main questions of the study, a holistic QFD model, which aimed to improve service quality using patients' needs priorities that will be translated into technical attributes needed to satisfy patient requirements,



exceed their satisfaction as suitable for the Palestinian healthcare industry is developed.

The construction of each section in the HOQ is discussed in the following six steps. The house was built utilizing a spreadsheet program (MS Excel).

### **5.2.1 Step 1: Identifying the patients' requirements PR (WHATs/VOP)**

The strength of QFD is in the identification of patients' requirements during the beginning of the process. The patients' requirements are without controversy the most crucial part of this model. Without them, there would be no available criteria to analyze or to improve upon; it is the grounds to build the HOQ and the basis for optimization (Maewall and Dumas, 2012). Accordingly, the first step of HOQ is to elicit and capture the basic needs and requirements of the patients- or WHAT the patients' wants.

There are many methods to collect patients' requirements. In this study, the voice of thalassemia patients was captured by personal interviews and focus group discussion with patients as illustrated previously in Chapter Three. After the VOP had been gathered via the interview process and according to the results from patients' interviews analysis, the patients may express their requirements on too generally or too detailed service attributes; additionally as mentioned earlier, the patients may state their needs and requirements in vague and ambiguous terms. Therefore, these data need to be organized and distilled into handful statements that express

significant patients' requirements (Alrabghi, 2013). To help manage the massive requirements, affinity diagramming is a useful tool to assist with this effort. Brief statements which capture key patients' requirements are transcribed onto cards. These cards are organized into logical groupings or related needs (Alrabghi, 2013; Burge, 2007). This will make it easier to identify any redundancy and serves as a basis for organizing the patients' needs for the first QFD matrix.

In this research, as illustrated earlier, SERVQUAL's structure for identifying the key requirements of the medical services that any thalassemia patient aspiring to get from the hospital were used. A total of 48 thalassemia patients' requirements were grouped into six categories, and each category was given a title. The left side of the HOQ was completed with patients' requirements as shown in Appendix D. The affinity diagram is shown in Figure (5.1):

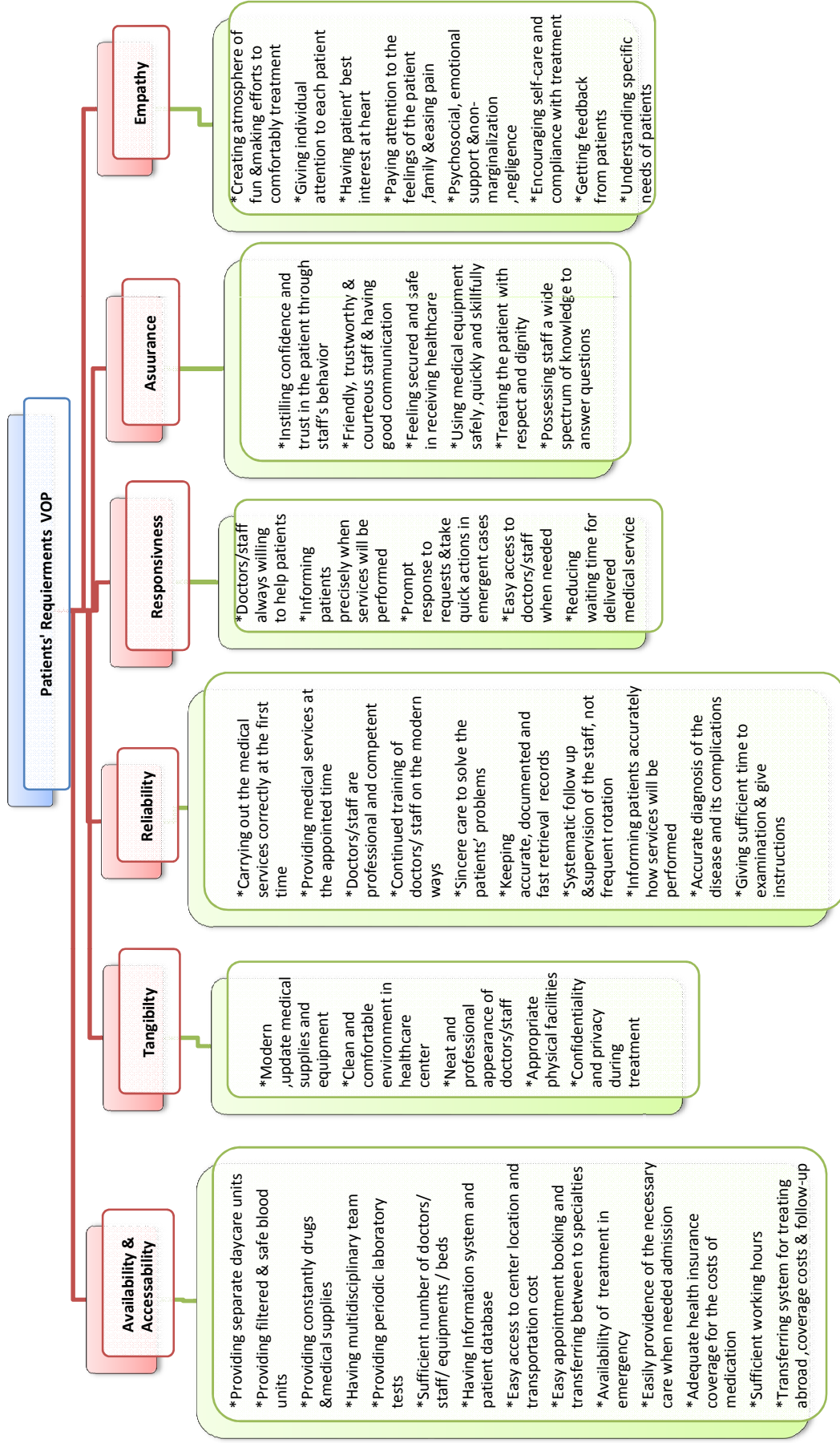


Figure (5.1): Affinity diagram of patients' requirements (VOP)

### **5.2.2 Step 2: Planning Matrix**

After stating patients' requirements, the next step of QFD was to determine the planning matrix within the HOQ. Two tasks were involved in this step: prioritizing patient needs (importance) and conducting competitive benchmarking (performance). This planning matrix is a very important part of the HOQ diagram that helps to determine the most important features to ensure patient satisfaction with a medical service – in other words the WHYs are used to determine how the patient needs (WHATs) will be prioritized, and to determine how a healthcare organizations are seen by its patients (Maewall and Dumas, 2012). By assessing the competitive edge, they are able to examine their current service performance and they can look at the ratings of itself and its key competitors and see what they need to improve upon to have the best service. And if their service performance is low compared to other competitors, they should re-evaluate their performance including their perception about customer needs. Also, they can look at how the patients rate other hospitals and implement some of what the other hospitals are doing that is helping them to achieve a better service in the patient's eyes (Maewall and Dumas, 2012). This competitive assessment helps the hospital create a strategic plan to achieve better patient satisfaction.

Based on the basic data obtained from the first step, the planning matrix in this study was accomplished through a structured questionnaire which was designed and distributed among thalassemia patients who were

asked on a 5-point scale for quantifying the importance and performance rating on each patient requirement (WHAT); for these selected competitors: WB hospitals, GS hospital and Dubai centre, as discussed previously. After gathering the feedbacks from the questionnaires and analyzing data, the right side of the HOQ was established. The '*VOP Importance rating*' column as shown in Table 5.1 contains the weight of importance for each requirement which was calculated by descriptive analysis as illustrated in Chapter Four. It should be noted, the findings of the importance ratings of WB hospitals have been taken in building this matrix.

**Table (5-1): Mean Level of Importance for each VOP**

| Categories                   | Level of Importance                                                  | West Bank Hospitals | Gaza Hospital | Dubai Thalassaemia Centre |
|------------------------------|----------------------------------------------------------------------|---------------------|---------------|---------------------------|
| Availability & Accessibility | Providing separate daycare units                                     | 4.69                | 4.76          | 4.46                      |
|                              | Providing filtered & safe blood units                                | 4.82                | 4.71          | 4.84                      |
|                              | Providing constantly drugs and medical supplies                      | 4.68                | 4.78          | 4.83                      |
|                              | Having multidisciplinary team                                        | 4.57                | 4.56          | 4.67                      |
|                              | Providing periodic laboratory tests                                  | 4.81                | 4.69          | 4.73                      |
|                              | Sufficient number of doctors/ staff/ equipments / beds               | 4.56                | 4.51          | 4.55                      |
|                              | Information system and patient database                              | 4.17                | 4.43          | 4.26                      |
|                              | Easy access to center location and transportation cost               | 4.05                | 4.40          | 4.15                      |
|                              | Easy appointment booking and transferring between to specialties     | 4.48                | 4.47          | 4.43                      |
|                              | Availability of treatment in emergency                               | 4.53                | 4.51          | 4.56                      |
|                              | Easily providence of the necessary care when needed admission        | 4.47                | 4.45          | 4.46                      |
|                              | Adequate health insurance coverage for the costs of medication       | 4.66                | 4.51          | 4.34                      |
|                              | Sufficient working hours                                             | 4.43                | 4.40          | 4.56                      |
|                              | Transferring system for treating abroad & coverage costs & follow-up | 4.43                | 4.76          | 4.30                      |
| <b>Total</b>                 | <b>4.57</b>                                                          | <b>4.63</b>         | <b>4.51</b>   |                           |
| Tangibility                  | Modern ,update medical supplies and equipment                        | 4.48                | 4.65          | 4.42                      |
|                              | Clean and comfortable environment in healthcare center               | 4.51                | 4.49          | 4.47                      |
|                              | Neat and professional appearance of doctors/staff                    | 3.88                | 4.43          | 3.94                      |
|                              | Appropriate physical facilities                                      | 4.21                | 4.31          | 4.14                      |
|                              | Confidentiality and privacy during treatment                         | 4.62                | 4.25          | 4.60                      |
| <b>Total</b>                 | <b>4.34</b>                                                          | <b>4.43</b>         | <b>4.31</b>   |                           |
| Reliability                  | Carrying out the medical services correctly at the first time        | 4.56                | 4.20          | 4.66                      |
|                              | Providing medical services at the appointed time                     | 4.60                | 4.16          | 4.50                      |
|                              | Doctors/staff are professional and competent                         | 4.53                | 4.11          | 4.50                      |
|                              | Continued training of doctors/ staff on the modern ways              | 4.38                | 4.16          | 4.19                      |
|                              | Sincere care to solve the patients' problems                         | 4.31                | 4.27          | 4.28                      |

|                |                                                                         |             |             |             |
|----------------|-------------------------------------------------------------------------|-------------|-------------|-------------|
|                | Keeping accurate, documented and fast retrieval records                 | 4.30        | 4.22        | 4.34        |
|                | Systematic follow up &supervision of the staff, not frequent rotation   | 4.32        | 4.14        | 4.45        |
|                | Informing patients accurately how services will be performed            | 4.40        | 4.07        | 4.57        |
|                | Accurate diagnosis of the disease and its complications                 | 4.57        | 4.16        | 4.66        |
|                | Giving sufficient time to examination & give instructions               | 4.64        | 4.11        | 4.62        |
| <b>Total</b>   |                                                                         | <b>4.46</b> | <b>4.16</b> | <b>4.48</b> |
| Responsiveness | Doctors/staff always willing to help patients                           | 4.51        | 4.14        | 4.64        |
|                | Informing patients precisely when services will be performed            | 4.50        | 4.11        | 4.54        |
|                | Prompt response to requests &take quick actions in emergent cases       | 4.63        | 4.29        | 4.67        |
|                | Easy access to doctors/staff when needed                                | 4.54        | 4.05        | 4.59        |
|                | Reducing waiting time for delivered medical service                     | 4.61        | 4.02        | 4.54        |
| <b>Total</b>   |                                                                         | <b>4.56</b> | <b>4.12</b> | <b>4.60</b> |
| Assurance      | Instilling confidence and trust in the patient through staff's behavior | 4.43        | 4.07        | 4.58        |
|                | Friendly, trustworthy & courteous staff & having good communication     | 4.49        | 4.04        | 4.55        |
|                | Feeling secured and safe in receiving healthcare                        | 4.47        | 4.04        | 4.54        |
|                | Using medical equipment safely ,quickly and skillfully                  | 4.51        | 3.96        | 4.60        |
|                | Treating the patient with respect and dignity                           | 4.63        | 4.02        | 4.80        |
|                | Possessing staff a wide spectrum of knowledge to answer questions       | 4.54        | 3.98        | 4.61        |
| <b>Total</b>   |                                                                         | <b>4.51</b> | <b>4.02</b> | <b>4.61</b> |
| Empathy        | Creating atmosphere of fun &making efforts to comfortably treatment     | 4.38        | 4.02        | 4.41        |
|                | Giving individual attention                                             | 4.27        | 4.03        | 4.45        |
|                | Having patient' best interest at heart                                  | 4.40        | 4.07        | 4.38        |
|                | Paying attention to the feelings of the patient, family &easing pain    | 4.49        | 4.02        | 4.64        |
|                | Psychosocial, emotional support &non-marginalization ,negligence        | 4.46        | 4.09        | 4.71        |
|                | Encouraging self-care and compliance with treatment                     | 4.56        | 4.05        | 4.65        |
|                | Getting feedback from patients                                          | 4.19        | 4.03        | 4.32        |
|                | Understanding specific needs of patients                                | 4.23        | 3.96        | 4.40        |
| <b>Total</b>   |                                                                         | <b>4.37</b> | <b>4.03</b> | <b>4.50</b> |

In detail, based on all results obtained from calculations and data analysis, the findings demonstrate that the '*Availability and Accessibility*' dimension is considered as the most important SERVQUAL dimension for the thalassemia patients in WB besides GS. It was remarked that: 'providing filtered and safe blood units', 'providing periodic laboratory tests', 'providing separate daycare units', 'providing constantly drugs/medical supplies' and 'adequate health insurance coverage for the costs of medication' were the most important and first priority requirements in the 'availability and accessibility' category. These results are logical considering those requirements represent all lifesaving treatment and consistent with interviews analysis results. It should be noted; the result associated with 'transferring system for treating abroad & coverage costs & follow-up' is with lower importance for WB patients on the contrary for GS patients who considered it as the most priority; may be due to the strongly suffering from constraints related to the political conditions which forbid them from getting their rights to be treated abroad. Second priority should be given to the following requirements: 'having multidisciplinary team', 'sufficient number of doctors/ staff/ equipments /beds', 'available treatment in emergency' and 'easy appointment booking and transferring between to specialties'. These requirements clearly help patients to ease the suffering from difficulty procedures during receiving medical service. On the other hand, the 'sufficient working hours', 'information system and database' and 'easy access to center location and transportation cost' were the least important requirements in the same category.



It was also noticed that ‘prompt response to requests and take quick actions in emergent cases’ was the most important requirement in the *'Responsiveness'* category that is considered as the second most important SERVQUAL dimension for patients in this study. This finding is consistent with Lim and Tang (1999) who found prompt services were the most important aspect in the responsiveness dimension and noted that the reason for this may be due to the medical condition of the patients. Other following requirements that patients expressed were: ‘reducing waiting time for delivered medical service’ and ‘easy access to doctors/staff when needed’; on the other hand, ‘doctors/staff always willing to help patients’ and ‘informing patients precisely when services will be performed’ were the least important requirements within the same category.

In the *'Assurance'* dimension that is considered as the third most important SERVQUAL dimension for patients in this study; ‘treating with respect and dignity’ was rated the most essential requirement in this category. Other following requirements where priority should be given: ‘possessing staff a wide spectrum of knowledge to answer questions’, ‘using medical equipment safely, quickly and skillfully’ and ‘friendly, trustworthy, courteous staff & having good communication’. On the other hand, ‘feeling secured and safe in receiving healthcare’ and ‘instilling confidence and trust in the patient through staff's behavior’ were the least important requirements within the same category.

Overall, this finding is consistent with Lim and Tang (1999) who pointed the patients' choices clearly show that Assurance and

Responsiveness are from the most critical dimensions of hospital services. The results when considered collectively imply an important message from patients to hospital managers: "Be responsive, be friendly, be courteous, treat patients with dignity and respect and most of all, possessing a wide spectrum of knowledge to answer questions ". Fourthly, in the '*Reliability*' dimension, it was observed that the 'giving sufficient time to examination & give instructions', 'providing medical services at the appointed time', 'accurate diagnosis of the disease and its complications', 'carrying out the medical services correctly at the first time' and 'doctors/staff are professional and competent' were the most important and first priority requirements in the '*Reliability*' category. Other following requirements that patients stated were: 'informing patients accurately how services will be performed', 'continued training of doctors/ staff on the modern ways', 'systematic follow up &supervision of the staff, not frequent rotation'; on the other hand, 'keeping accurate, documented and fast retrieval records' was the least important requirements within the same category. It should be noted; the result associated with 'sincere care to solve the patients problems' is with lower importance for WB patients on the contrary for GS patients who considered it as the most priority; this is may be due to the significant role of TPFS that carry and support patients' needs in WB which is still in its initial stage in GS.

It was remarked that the 'encouraging self-care and compliance with treatment', 'paying attention to the feelings of the patient, family and easing pain', 'psychosocial, emotional support and non-marginalization,

negligence' were the most important requirements in the '*Empathy*' category. On the other hand, 'getting feedback from patients' was the least important requirements within the same category. This, however, was contrary to the findings of Lim and Tang (2000) who found the Empathy dimension is the second most important category while scored as fifth category in this study. This is due to the patients' expectations focusing on the "What is done" besides "how it should be done".

Moreover, the findings demonstrate that the '*Tangibility*' dimension is considered as the last important SERVQUAL dimension in the study. It was remarked that the 'confidentiality and privacy during treatment', 'clean and comfortable environment in healthcare center' and 'modern, update medical supplies and equipment' were the most important requirements in the '*Tangibility*' category. On the other hand, 'neat and professional appearance of doctors/staff' was the least important requirement within the same category. These findings illustrate that patients were mostly younger and became interested in the privacy issues because of the traditions and culture which defiantly suppose them to be separated in order to be treated in more comfortably.

The next part of this matrix is competitive benchmarking; the average rank for each hospital under each requirement was calculated via descriptive analysis as mentioned in Chapter four. The average number is useful for direct comparison to judge the aspect of strength and weakness for each hospital, to determine what aspects need to be changed to surpass

the competitors, what aspects need to be changed to equal the competitors, and what aspects will be left unchanged. The optimal combination is desired. Large numbers indicate that the hospital has an excellent performance; small numbers indicate that the hospital has a poor performance.

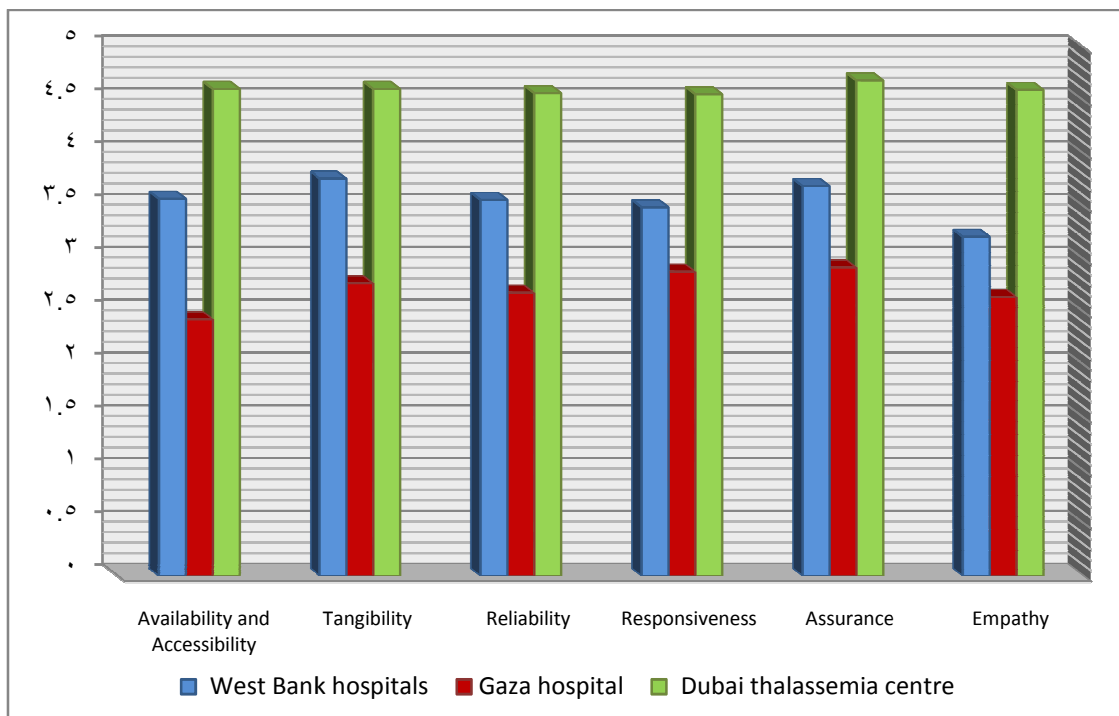
Benchmarking analysis was performed based on the level of patient satisfaction about hospitals' quality performance. Amongst the three selected competitors, the highest rated hospital was Dubai thalassemia centre, followed by West Bank hospitals as shown in Table 5-2. Gaza hospital's overall quality was the lowest. This ranking is not surprising, considering that Dubai thalassemia centre has granted accreditation from the Joint Commission International Accreditation (JCIA), in addition was awarded "The Shiekh Hamdan Excellency Award for medical sciences". In fact, as shown in Figure (5.2), almost service quality dimensions: Availability and Accessibility, Tangibility, Reliability, Responsiveness, Assurance and Empathy; Dubai thalassemia centre attained the highest rate of satisfaction where almost all of the requirements are highly ranked ranging [86% - 96%] as the excellent performance from patients' perspective. Therefore, it could be used as the standard to be achieved.

**Table (5-2): Competitive Benchmarking Analysis for Hospitals' Quality Performance**

| Categories                   | Level of satisfaction about hospitals' quality performance           | West Bank Hospitals | Gaza Hospital | Dubai Thalassaemia Centre |
|------------------------------|----------------------------------------------------------------------|---------------------|---------------|---------------------------|
| <b>Overall quality</b>       |                                                                      | <b>3.54</b>         | <b>2.72</b>   | <b>4.60</b>               |
| Availability & Accessibility | Providing separate daycare units                                     | 4.16                | 2.49          | 4.80                      |
|                              | Providing filtered & safe blood units                                | 3.90                | 2.53          | 4.69                      |
|                              | Providing constantly drugs and medical supplies                      | 3.55                | 2.11          | 4.81                      |
|                              | Having multidisciplinary team                                        | 3.17                | 2.36          | 4.73                      |
|                              | Providing periodic laboratory tests                                  | 3.68                | 2.09          | 4.71                      |
|                              | Sufficient number of doctors/ staff/ equipments / beds               | 3.37                | 2.54          | 4.54                      |
|                              | Information system and patient database                              | 3.95                | 2.84          | 4.60                      |
|                              | Easy access to center location and transportation cost               | 2.56                | 2.49          | 4.57                      |
|                              | Easy appointment booking and transferring between to specialties     | 3.42                | 2.45          | 4.42                      |
|                              | Availability of treatment in emergency                               | 3.65                | 2.69          | 4.33                      |
|                              | Easily providence of the necessary care when needed admission        | 4.10                | 2.58          | 4.47                      |
|                              | Adequate health insurance coverage for the costs of medication       | 4.23                | 2.62          | 4.79                      |
|                              | Sufficient working hours                                             | 3.73                | 2.54          | 4.58                      |
|                              | Transferring system for treating abroad & coverage costs & follow-up | 2.54                | 1.69          | 4.54                      |
| <b>Total</b>                 |                                                                      | <b>3.57</b>         | <b>2.43</b>   | <b>4.61</b>               |
| Tangibility                  | Modern ,update medical supplies and equipment                        | 3.19                | 2.47          | 4.66                      |
|                              | Clean and comfortable environment in healthcare center               | 3.98                | 2.82          | 4.79                      |
|                              | Neat and professional appearance of doctors/staff                    | 4.17                | 2.93          | 4.80                      |
|                              | Appropriate physical facilities                                      | 3.27                | 2.73          | 4.44                      |
|                              | Confidentiality and privacy during treatment                         | 4.17                | 2.89          | 4.34                      |
| <b>Total</b>                 |                                                                      | <b>3.76</b>         | <b>2.77</b>   | <b>4.61</b>               |

|                |                                                                         |             |             |             |
|----------------|-------------------------------------------------------------------------|-------------|-------------|-------------|
| Reliability    | Carrying out the medical services correctly at the first time           | 3.81        | 2.83        | 4.68        |
|                | Providing medical services at the appointed time                        | 3.83        | 2.80        | 4.57        |
|                | Doctors/staff are professional and competent                            | 3.50        | 2.89        | 4.60        |
|                | Continued training of doctors/ staff on the modern ways                 | 3.36        | 2.71        | 4.46        |
|                | Sincere care to solve the patients' problems                            | 2.91        | 2.38        | 4.53        |
|                | Keeping accurate, documented and fast retrieval records                 | 3.89        | 2.82        | 4.58        |
|                | Systematic follow up & supervision of the staff, not frequent rotation  | 3.65        | 2.65        | 4.54        |
|                | Informing patients accurately how services will be performed            | 3.63        | 2.58        | 4.57        |
|                | Accurate diagnosis of the disease and its complications                 | 3.61        | 2.54        | 4.53        |
|                | Giving sufficient time to examination & give instructions               | 3.44        | 2.64        | 4.60        |
| <b>Total</b>   |                                                                         | <b>3.56</b> | <b>2.68</b> | <b>4.57</b> |
| Responsiveness | Doctors/staff always willing to help patients                           | 3.86        | 2.94        | 4.68        |
|                | Informing patients precisely when services will be performed            | 3.41        | 2.96        | 4.57        |
|                | Prompt response to requests & take quick actions in emergent cases      | 3.65        | 2.78        | 4.54        |
|                | Easy access to doctors/staff when needed                                | 3.33        | 2.85        | 4.60        |
|                | Reducing waiting time for delivered medical service                     | 3.19        | 2.85        | 4.39        |
| <b>Total</b>   |                                                                         | <b>3.49</b> | <b>2.88</b> | <b>4.56</b> |
| Assurance      | Instilling confidence and trust in the patient through staff's behavior | 3.28        | 2.94        | 4.63        |
|                | Friendly, trustworthy & courteous staff & having good communication     | 3.82        | 2.92        | 4.79        |
|                | Feeling secured and safe in receiving healthcare                        | 3.78        | 2.89        | 4.67        |
|                | Using medical equipment safely, quickly and skillfully                  | 3.76        | 2.87        | 4.69        |
|                | Treating the patient with respect and dignity                           | 3.90        | 2.94        | 4.70        |
|                | Possessing staff a wide spectrum of knowledge to answer questions       | 3.62        | 2.93        | 4.67        |
| <b>Total</b>   |                                                                         | <b>3.69</b> | <b>2.92</b> | <b>4.69</b> |

|              |                                                                       |             |             |             |
|--------------|-----------------------------------------------------------------------|-------------|-------------|-------------|
| Empathy      | Creating atmosphere of fun & making efforts to comfortably treatment  | 3.23        | 2.76        | 4.54        |
|              | Giving individual attention                                           | 3.31        | 2.78        | 4.62        |
|              | Having patient' best interest at heart                                | 3.41        | 2.63        | 4.61        |
|              | Paying attention to the feelings of the patient, family & easing pain | 3.18        | 2.64        | 4.62        |
|              | Psychosocial, emotional support & non-marginalization ,negligence     | 3.00        | 2.53        | 4.58        |
|              | Encouraging self-care and compliance with treatment                   | 3.52        | 2.58        | 4.66        |
|              | Getting feedback from patients                                        | 2.88        | 2.63        | 4.64        |
|              | Understanding specific needs of patients                              | 3.15        | 2.54        | 4.57        |
| <b>Total</b> |                                                                       | <b>3.21</b> | <b>2.64</b> | <b>4.60</b> |



**Figure (5.2): Benchmarking of SERVQUAL Dimensions**

Furthermore, Figure (5.2) shows that Gaza hospital is the weakest in the service dimension of Availability and Accessibility. Since the Availability and Accessibility dimension is the first most important dimension for thalassemia patients in Palestine as shown by the high importance value in Table 5-1, efforts should therefore be made in

improving following requirements due to the lowest rate of satisfaction (see Table 5-2) and highest importance rate for Gaza patients. It was observed that Gaza hospital providing constantly drugs and medical supplies with a rate of 42.2%, providing periodic laboratory tests with a rate of 41.8% and the transferring system for treating abroad facilitated only with a rate of 33.8%. Additionally, only 50.6% of patients satisfied with quality of blood units, only 49.8% satisfied with the daycare unit and 47.2% show that the hospital having multidisciplinary team. While 53.8% admitted that they are provided treatment in emergency. (See Appendix B: Table (12))

Also, Gaza Hospital performance is weaker in Empathy and Reliability dimensions compared to other rest dimensions as shown in Figure (5.2). It was remarked that 50.6% of participants recognized that the GS hospital offering psychosocial and emotional support and encouraging self-care with a rate of 51.6%. On the other hand, patients indicated that hospital's doctors diagnosing the disease and its complications accurately with only a rate of 50.8% and giving sufficient time to examination with a percentage of 52.8%. Also, findings show that GS hospital has the lowest sincere caring to solve patients' problem with rate of 47.6%. On the other hand, Gaza Hospital performed better in Assurance, Responsiveness and Tangibility dimensions.

Regarding the importance results, assurance as illustrated was the third most important dimension for patients. However, WB Hospitals performed better in this dimension. Whereas 78% of participants admitted



that they are treated with respect and dignity and 76.4% of patients indicated that the staff was kind and friendly. On the other hand, 65.6% of participants noted those hospitals' doctors and staff promoted confidence in patients because they possess a wide spectrum of knowledge whereas 72.4% of them admitted that besides their attitudes. (See Appendix B: Table (10)). As a result, WB hospitals have the opportunity to make significant strides in this dimension.

Also, WB Hospitals performed better in Tangibility dimension. The results indicated that 83.4% of patients' responses clearly show those hospitals' doctors and staff were perceived to be neat and professional in appearance, and the confidentiality and privacy during treatment were provided. Also, WB hospitals were perceived by 63.8% of patients to have modern, update equipment and supplies while 65.4% of participants recognize the physical facilities are appropriate and 79.6% of them perceived the hospitals' environment are clean and comfortable. Thus, WB Hospitals have the opportunity to make significant strides in these areas.

On the other hand, since the responsiveness dimension was the second most important dimension for patients. However, WB Hospitals' performance is weaker in this dimension compared with others as shown in Figure (5.2). The results show the prompt response scored with 73% percent and 77% of participants recognized the willingness of staff to help; in contrast reducing waiting time for delivered services and easy access to doctors scored the lowest mean with 63.8% and 66.6% respectively.

In addition, the findings demonstrate that the WB hospitals have the weakest performance in Empathy dimension as shown in Figure (5.2). It was remarked that 68.2% of participants admitted that the WB hospitals having patients' best interest at heart and they are encouraging self-care with 70.4% percent. On the other hand, psychosocial and emotional support offered with 60% and 57.6% getting feedback from patients. Moreover, the WB hospitals performed acceptably in Availability and Acceptability dimension and Reliability dimension. The results indicated that 84.6% of participants satisfied with the health insurance and say that it covered the services provided at hospitals; this consistent with interviews results and literature. It was observed that WB hospitals providing blood units with a rate of 78%, providing constantly drugs and medical supplies with a rate of 71%, providing periodic laboratory tests with a rate of 73.6% and also, 83.2% of participants admitted that WB hospitals providing separate daycare units and they are provided the necessary care when needed admission with a percentage of 82%. On the other hand, findings demonstrated that 51.2% of participants say that the accessibility to center location is not easy and perceived the transferring system for treating abroad facilitated with a rate of 50.8%.

On the other hand, patients show those hospitals' doctors are professional and competent with a rate of 70% and giving sufficient time to examination with a percentage of 68.8%. Also, findings show that WB hospitals have lower sincere caring to solve patients' problem with rate of 58.2%. It was remarked that 76.2% of participants admitted that the WB

hospitals carrying out the service correctly at the first time and providing services at appointed time with a percentage of 76.6%. Finally, importance weights and competitive benchmarking are graphically represented to visualize the importance of patient needs and the current performance of the hospitals as compared to that of its competitors. Blue color line shows “West-Bank hospitals”, Red color line shows “Gaza hospital” and light green color line shows “Dubai thalassemia centre”. Appendix D shows the planning matrix in the HOQ.

### **5.2.3 Step 3: Identifying the technical requirements TR (HOWs/VOE)**

After completing the patient’s requirements list (WHATs), the next step is to determine the technical requirement or service quality specifications which must be optimized to assure patient satisfaction. The technical requirements are called the (HOWs) and are placed on the top of the house. They are also referred to as “The Voice of Engineer”. Technical requirements are necessary to define how each patient requirement will be satisfied by the medical service; where these technical or engineering characteristics are showed the subjective patient requirements translating qualitative requirements into objective quantitative characteristics.

These technical requirements should be controllable, meaningful and measurable characteristics of the service and the units of measurement must be defined (Alrabghi, 2013; Al-Bashi et al., 2012). Also, they can be evaluated and benchmarked against the competition at the end of the improvement and development processes, without them there is no way to

know what should be done or what is required to meet the needs of the patients (Maewall and Dumas, 2012). At least one technical attribute should be identified for each patient requirement, even though each single technical attribute may affect more than one patient requirement. If a technical attribute does not affect any patient requirement it may be redundant. Table 5-3 identifies the technical requirements that are chosen by looking at the patients' requirements and thinking of ways that allow the achievement of these requirements. This is done through a brainstorming among experts together with literature reviews and taking the advantage of the information from previous publications, along with various internet sources for references to healthcare industry standards; which may be used to spark brainstorming and creativity to develop technical requirements.

On the other hand, the second part of the technical requirements is to determine the direction of improvement (Maewall and Dumas, 2012). This is where the target value which will be talked about later and see if the hospital has to minimize the improvements, maximize the improvements, or stay and remain constant as it is; for each requirement, then these are represented by symbols. In this model, all the requirements should be maximized in order to improve medical services provided by WB and GS hospitals except one attribute; it can maintain the current level. At the end, a total of 45 technical requirements were grouped into four related categories, and each category was given a title. The top side of the HOQ was completed with technical requirements and direction of improvement as shown in Appendix D.

**Table (5-3): Technical Requirements (VOE), units of measurement and target value**

| No               | Technical Requirement                                | Measurement Unit                                                                     | Scale                                                                                                             | Target value                                                                                                               |
|------------------|------------------------------------------------------|--------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------|
| <b>STAFFING:</b> |                                                      |                                                                                      |                                                                                                                   |                                                                                                                            |
| 1.               | Doctors/ staff qualification & experience level      | - Degree<br>- Number of years                                                        | - Low (High school)/<br>Inadequate (Diploma)/<br>Adequate (BSc) /<br>High (MSc)/<br>Excessive (PhD)<br>- 3/5/7/10 | ≥ (BSc) degree ,<br>≥ 5 years<br>experience in<br>THAL field                                                               |
| 2.               | Staff training, education and development programs   | - type<br>- Available percentage for all staff<br>- Hour(s) in quarterly period      | - External or internal courses<br>-L+ (0-19%)/ L (20-39%)/ M (40-59%)/ H (60-79%)/H+(80-100%)<br>- 8/16/24/32/40  | Advanced external training for 3 seniors, quarterly internal courses with 32 training hours for more than 60% of all staff |
| 3.               | Having Multi-disciplinary doctors in the hospital    | - Number of doctors accordance field of disciplines<br>- Types of discipline variety | Number                                                                                                            | Recruiting hematologists, and work as a team include: Hematologist / Internist, Endocrinologist and psychologist           |
| 4.               | Hiring Enough full-time doctors/staff                | No of doctors/staff accordance average No. of patients                               | Number                                                                                                            | Hiring at least 1 full-time doctor in each unit with 4 personnel                                                           |
| 5.               | Mechanisms to ensure staff accountability            | - set of roles<br>- Percentage of implementation                                     | ----<br>L+ (0-19%)/ L (20-39%)/ M (40-59%)/ H (60-79%)/H+ (80-100%)                                               | 100% implementation                                                                                                        |
| 6.               | Staff motivation skill level                         | Scale                                                                                | (Unmotivated/Somewhat motivated /Motivated/Well motivated/Highly motivated)                                       | Adapting staff motivation policy                                                                                           |
| 7.               | Staff empowerment and involvement in decision making | Percentage                                                                           | L+ (0-19%)/ L (20-39%)/ M (40-59%)/ H (60-79%)/H+ (80-100%)                                                       | Involving 65% of staff                                                                                                     |

|                             |                                                                |                                                                                              |                                                                  |                                                                                                                  |
|-----------------------------|----------------------------------------------------------------|----------------------------------------------------------------------------------------------|------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------|
| 8.                          | Behavior and attitude of staff                                 | Scale                                                                                        | ( Excellent / Good / Bad)                                        | Excellent                                                                                                        |
| 9.                          | Teamwork, knowledge and communication excellence skills level  | Percentage                                                                                   | L+ (0-19%) / L (20-39%) / M (40-59%) / H (60-79%) / H+ (80-100%) | Very high skills (80- 100%)                                                                                      |
| <b>PHYSICAL FACILITIES:</b> |                                                                |                                                                                              |                                                                  |                                                                                                                  |
| 10.                         | Space of facility                                              | Size area (m <sup>2</sup> ) per patient bed proportional the average No. of patients per day | Number of beds                                                   | Size area of the care unit proportional with 10 beds                                                             |
| 11.                         | Facility layout and ambient conditions                         | Capacity                                                                                     | (Volume)                                                         | Provide 2 big separate rooms for patients (Male-Female) in the unit where possible, Very high capacity level 90% |
| 12.                         | Hygiene and cleanness of facility                              | Scale                                                                                        | (Unclean/Somewhat unclean/ Clean/Highly clean/Extremely clean)   | Extremely clean & neat                                                                                           |
| 13.                         | Closeness of facility location                                 | Geographical location and size of the patient population                                     | -----                                                            | Maintain current level                                                                                           |
| 14.                         | Building structure safety                                      | Safety Rate                                                                                  | L+ (0-19%) / L (20-39%) / M (40-59%) / H (60-79%) / H+ (80-100%) | Very high safety rate 100%                                                                                       |
| 15.                         | Excellent housekeeping                                         | Scale                                                                                        | Very low/ Low /Medium /High /Very high                           | Very high                                                                                                        |
| 16.                         | Having enough equipments & treatment supplies at point of care | No of equipments and supplies accordance average No. of patients                             | Number                                                           | Need to increase the quantities                                                                                  |
| 17.                         | Technical equipments strength                                  | Strength and accuracy Rate                                                                   | L+ (0-19%) / L (20-39%) / M (40-59%) / H (60-79%) / H+ (80-100%) | Choosing the best device with very high accuracy 100%, {need to activate MRI: T2*}                               |

|                       |                                                   |                                                                                                                    |                                                                                    |                                                                                                         |
|-----------------------|---------------------------------------------------|--------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------|
| 18.                   | Frequency of equipments & facilities maintenance  | Periodic basis                                                                                                     | (Month-Week-Days)                                                                  | 90% in compliance with maintenance schedules on periodic basis                                          |
| 19.                   | Uniforms and dress code for staff                 | Percentage                                                                                                         | L+ (0-19%)/ L (20-39%)/ M (40-59%)/ H (60-79%)/H+ (80-100%)                        | 100% in compliance                                                                                      |
| <b>INFORMATION:</b>   |                                                   |                                                                                                                    |                                                                                    |                                                                                                         |
| 20.                   | Quality documentation and record-keeping          | -Accuracy rate<br>- Updated records on timely basis as consumption varies                                          | -L+ (0-19%)/ L (20-39%)/ M (40-59%)/ H (60-79%)/H+(80-100%)<br>- (month-week-days) | Very high accuracy 100% , Updating on timely basis                                                      |
| 21.                   | Computerized information system                   | Use effectiveness rate                                                                                             | Very low/ Law /Medium /High /Very high                                             | Very high level of effective utilization                                                                |
| 22.                   | Frequent patient contact and information exchange | Scale                                                                                                              | Very low/ Law /Medium /High /Very high                                             | Very high                                                                                               |
| <b>CARE DELIVERY:</b> |                                                   |                                                                                                                    |                                                                                    |                                                                                                         |
| 23.                   | Voluntary blood donation                          | Average of donations per year                                                                                      | L+ (0-19%)/ L (20-39%)/ M (40-59%)/ H (60-79%)/H+ (80-100%)                        | Increase donor pool to 45-50%, opportunity for 3000 person to donate blood at a rate of once every year |
| 24.                   | Storage capacity                                  | - No. of stored items accordance monthly consumption/patient<br>- Reliability & safety conditions<br>- Expiry date | Very low/ Law /Medium /High /Very high                                             | Very high level quality and quantity of storage capacity                                                |
| 25.                   | Reliability of suppliers                          | Reliability rate                                                                                                   | L+ (0-19%)/ L (20-39%)/ M (40-59%)/ H (60-79%)/H+ (80-100%)                        | 75%                                                                                                     |
| 26.                   | Medication adherence                              | Pharmacy fill rate accordance monthly consumption /patient                                                         | L+ (0-19%)/ L (20-39%)/ M (40-59%)/ H (60-79%)/H+ (80-100%)                        | 85% pharmacy fill rate accordance monthly consumption /patient                                          |

|     |                                                                                          |                                                                                                                                                                                 |                                                                                                                         |                                                                                          |
|-----|------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------|
| 27. | frequency requisition of drugs, needed materials and medical consumables                 | <ul style="list-style-type: none"> <li>- Level of items in stock accordance monthly consumption/patient</li> <li>- Percentage of delivered items on time (lead time)</li> </ul> | L+ (0-19%)/ L (20-39%)/ M (40-59%)/ H (60-79%)/H+ (80-100%)                                                             | 90% On time delivery, the stock should never reach “zero level” before a request is made |
| 28. | Buffer stock of drugs , needed materials and medical consumables scheduling & monitoring | <ul style="list-style-type: none"> <li>- Level of items in stock accordance monthly consumption/patient</li> <li>- Periodic basis</li> </ul>                                    | <ul style="list-style-type: none"> <li>- Very low/ Low /Medium /High /Very high</li> <li>- (month-week-days)</li> </ul> | Monthly monitoring for consumption, maintaining high buffer stocks                       |
| 29. | Patients scheduling for treatment                                                        | Average No. of patients visits per day once per month                                                                                                                           | Number                                                                                                                  | 5 ≤ No. of patients visits per day once per month < 15                                   |
| 30. | Routine monitoring                                                                       | Periodic basis                                                                                                                                                                  | (Month-Week-Days-Hours)                                                                                                 | 90% implementation on regular basis                                                      |
| 31. | Documentation of well-aligned policies and procedures                                    | Set of procedures                                                                                                                                                               | -----                                                                                                                   | Must adopting documented policies for THAL in MOH                                        |
| 32. | Capacity for expert diagnosis                                                            | Percentage                                                                                                                                                                      | L+ (0-19%)/ L (20-39%)/ M (40-59%)/ H (60-79%)/H+ (80-100%)                                                             | 95%                                                                                      |
| 33. | Cost-effectiveness system                                                                | Optimal use rate of resources                                                                                                                                                   | L+ (0-19%)/ L (20-39%)/ M (40-59%)/ H (60-79%)/H+ (80-100%)                                                             | Rationalizing 85% expenditure of resources                                               |
| 34. | Staff Workload                                                                           | Number of work shifts                                                                                                                                                           | 1/2/3                                                                                                                   | Arrange another afternoon, evening or weekend shift work where possible                  |
| 35. | Quality & safety controls                                                                | Compliance rate                                                                                                                                                                 | L+ (0-19%)/ L (20-39%)/ M (40-59%)/ H (60-79%)/H+ (80-100%)                                                             | 100% in compliance                                                                       |
| 36. | Quality culture orientation                                                              | Percentage                                                                                                                                                                      | L+ (0-19%)/ L (20-39%)/ M (40-59%)/ H (60-79%)/H+ (80-100%)                                                             | Very high 100%                                                                           |



|     |                                          |                                                          |                                                                              |                                              |
|-----|------------------------------------------|----------------------------------------------------------|------------------------------------------------------------------------------|----------------------------------------------|
| 37. | Following correct protocols of treatment | Percentage                                               | L+ (0-19%)/ L (20-39%)/ M (40-59%)/ H (60-79%)/H+ (80-100%)                  | 85%                                          |
| 38. | Patient complaint handling               | Percentage                                               | L+ (0-19%)/ L (20-39%)/ M (40-59%)/ H (60-79%)/H+ (80-100%)                  | handling 70%                                 |
| 39. | Swiftness of Administrative Procedures   | - Time of administrative procedures<br>- Difficulty rate | - Hour(s)<br>- (Difficult /Somewhat difficult /Easy /Very easy/ highly easy) | Highly easy ,<br>{less than half hour}       |
| 40. | Staff response speed                     | Speed rate                                               | Very low/ Low /Medium /High /Very high                                       | Very high                                    |
| 41. | Time saving setup                        | Delivered on time                                        | Hour(s)                                                                      | Waiting time of not more than one hour       |
| 42. | Entertainment activities                 | Type & time                                              | ---                                                                          | Adopting Social Work policy at the hospitals |
| 43. | psychosocial support programs            | Type & hours                                             | ---                                                                          | Adopting Social Work policy at the hospitals |
| 44. | Patients and family education programs   | Type & hours                                             | ---                                                                          | Adopting Social Work policy at the hospitals |
| 45. | patient feedback Surveys                 | Time                                                     | Quarterly                                                                    | Quarterly                                    |

#### 5.2.4 Step 4: Relationship matrix between WHATs and HOWs

Once the patient requirements and the technical requirements were developed, a relationship matrix was constructed. The main function of the relationship matrix is to establish a connection between the Patients' service requirements and the technical requirements designed to improve the medical service (Alrabghi, 2013). Furthermore, this matrix identifies the technical requirements that satisfy most patient requirements and help to determine the appropriate investment of resources for each. Therefore, these technical requirements that address the most patient requirements

should be a main priority in the design process to ensure a service that satisfies the stated patient expectations (Uppalanchi, 2010). This matrix occupies the middle portion of the HOQ diagram which is the largest portion. It is an essential step in the QFD process since the concluding analysis stage relies heavily on the relationship of (WHATs) versus (HOWs) (Alrabghi, 2013).

Practically, each of the service design/management requirements is correlated individually to each of the patients' requirements by considering to what extent a requirement contributes to meeting Patients' requirements. Relationships are portrayed by symbols, indicating weak, moderate, or strong relationships, where a double circle or filled circle (●) is used for a strong relationship, a single circle (○) for a moderate relationship, and a triangle (▽) for a weak relationship and carry a numeric value of 9, 3 or 1, respectively. When no relationship is evident between a pair, a zero value is assigned or leaving a blank (Alrabghi, 2013). The relationship symbol is written in the intersection cell and accomplished by a brainstorming based on expert opinion, whereas the degree of the relationship is imprecise; and the values used to determine the strength of relationships are absolute. The body of the HOQ was completed with relationship matrix as shown in Appendix D.

It was noticed from the HOQ model that the patients' requirements related to Availability and accessibility dimension interrelated strongly with most of technical requirements related to staffing, Information and

care delivery categories and medium linked with some technical requirements related to physical facilities. For instance: patients' requirement of 'providing periodic laboratory tests' in the (WHATs) list, is strongly correlated with the following specifications: 'doctors/staff qualification level', 'staff training programs', 'mechanisms to ensure staff accountability', 'having enough equipments', 'technical equipments' strength' and 'frequency maintenance'. Also, it is strongly correlated with: 'quality documentation and recordkeeping', 'computerized information system', 'storage capacity', 'reliability of suppliers', 'frequency requisition of needed materials/consumables', 'buffer stock scheduling and monitoring', 'documentation of policies and procedures', 'quality and safety controls', 'staff response speed', 'time saving setup'; in the (HOWs) list.

Since this dimension was the first most important dimension for thalassemia patients in Palestine, it required a high level design processes such as: trained and high competences of staff, appropriate infrastructure, effective information system and efficient supply chain processes besides well-aligned policies, instructions and protocols in order to provide the necessary treatment in the highest quality and quantity.

Furthermore, (WHATs) in Tangibility dimension have strong relationships with (HOWs) concerning physical facilities category and weak to no relationships with (HOWs) related to staffing and care delivery categories. On the other hand, it was observed that the relationship between

patients' requirements related to Reliability, Responsiveness, Assurance and Empathy dimensions and technical requirements related to Staffing category was strong, and somewhat strong to medium with some technical requirements related to Care delivery and Information; while weak to no relationships with (HOWs) related to Physical facilities. It may be due to these requirements within these dimensions relay more on training and qualification levels of medical staff besides their expertise in handling and communicating.

### **5.2.5 Step 5: Correlation matrix**

Following the completion of the relationship and planning matrices, the technical correlations are determined. These correlations are depicted in the roof of the HOQ. The roof maps the relationships and interdependencies among the technical requirements (Uppalanchi, 2010). Relationships among the technical requirements are important to evaluate, as one technical requirement could either aid or hinder the success of another crucial technical requirement in meeting patient requirement. Whereas the objective is to identify which requirements support each other and which are in conflict. The analysis of which informs the development process, revealing the existence and nature of design bottlenecks (Uppalanchi, 2010). This part, as Cohen (1995) mentions, is probably the least used and the most underexploited part of QFD, yet its potential benefits are great. Working to improve one technical requirement can indirectly or directly affect another technical requirement positively or negatively or vice versa.

To establish the roof in this study, symbols were used to represent the strength of the relationship between the technical requirements and are assigned through a brainstorming. It has been worked through the cells of triangular matrix considering the pairings of technical requirements. Each (HOW) is compared to others, one by one. For each pair of (HOWs), the key question was to be answered: In the case of improving one requirement, will that deteriorate or improve in the other technical requirements? (Alrabghi, 2013) If the answer was that will deteriorate, an engineering trade-off existed and a symbol (-) was entered into the cell to represent this answer. On the other hand if the answer was that will improve; a symbol (+) was entered into the cell to represent this answer, otherwise leaving a blank if there is no correlation. The roof of the HOQ was completed with correlation matrix as shown in Appendix D.

As shown in HOQ model, it was observed many positive correlations between technical requirements were assigned; these positive correlations mean that the service development efficiency can be increased without competing or duplicating effort. Deciding which features are absolutely necessary to the service is aided by negative correlations; by increasing one feature, there is a decrease in another and vice versa; such as: the negative correlations between some (HOWs) and 'cost- effectiveness system' attribute, this finding is logical considering those inevitable resource constraints often restrict the number of improvements possible within one planning period (Lim et al., 1999). Eventually, this approach helps identify the minimum set of technical requirements of hospitals to meet the various

patient requirements, in turn leading to a cost-effective means of improving quality (Camgöz-Akdağ et al., 2013).

### **5.2.6 Step 6: Technical matrix**

The sixth and final step of Quality Function Deployment's House of Quality Diagram is the technical matrix. There are four important parts within this step. Those would be: the technical priorities, competitive technical benchmarking, target value and difficulty value. The first part of this matrix was prioritizing the technical requirements and computes the final absolute importance rating of each (HOW). The goal of this step of QFD is to find the most important issues and work on those issues to give the highest level of patient satisfaction (Maewall and Dumas, 2012). These weights were placed in a row at the bottom of the HOQ.

A final absolute importance rating is a comprehensive measure that indicates the degree to which a specific technical requirement is related to all patient requirements (Alrabghi, 2013). The absolute importance as shown in Table 5.4 depends on the average importance of each patient requirement and also on the strength of the relationship matrix between the patient requirement (VOP) and the technical requirement (VOE). The numerical calculation of absolute importance is the multiplication of the patient importance rating and the associated relationship cell value. Numbers are then added up in their respective columns to determine the absolute importance for each technical requirement. Absolute importance

weights are calculated for each (HOW) by the formula given (Shrivastava and Verma, 2014):

$$\text{Absolute weights for each HOW} = \text{Total sum of (Importance weight of WHAT} \times \text{relationship value of the corresponding cell between WHAT and the HOW)}$$

Finally, the absolute weights are presented in graph to provide quick insight into key requirements as shown in Appendix D.

**Table (5-4): Final Absolute Importance Weight for each VOE**

| Categories                        | Technical Requirements (VOE)                                   | Absolute Weight |
|-----------------------------------|----------------------------------------------------------------|-----------------|
| STAFFING                          | Doctors/ staff qualification & experience level                | 393.18          |
|                                   | Staff training, education and development programs             | 923.67          |
|                                   | Having Multi-disciplinary doctors in the hospital              | 294.14          |
|                                   | Hiring Enough full-time doctors/staff                          | 437.63          |
|                                   | Mechanisms to ensure staff accountability                      | 353.58          |
|                                   | Staff motivation skill level                                   | 323.2           |
|                                   | Staff empowerment and involvement in decision making           | 374.02          |
|                                   | Behavior and attitude of staff                                 | 555.21          |
| PHYSICAL FACILITIES               | Teamwork, knowledge and communication excellence skills level  | 882.93          |
|                                   | Space of facility                                              | 129.15          |
|                                   | Facility layout and ambient conditions                         | 247.23          |
|                                   | Hygiene and cleanness of facility                              | 120.51          |
|                                   | Closeness of facility location                                 | 97.03           |
|                                   | Building structure safety                                      | 167.31          |
|                                   | Excellent housekeeping                                         | 232.87          |
|                                   | Having enough equipments & treatment supplies at point of care | 276.34          |
|                                   | Technical equipments strength                                  | 256.19          |
|                                   | Frequency of equipments & facilities maintenance               | 137.91          |
| Uniforms and dress code for staff | 39.49                                                          |                 |

| Categories                             | Technical Requirements (VOE)                                                | Absolute Weight |
|----------------------------------------|-----------------------------------------------------------------------------|-----------------|
| INFORMATION                            | Quality documentation and record-keeping                                    | 369.25          |
|                                        | Computerized information system                                             | 375.46          |
|                                        | Frequent patient contact and information exchange                           | 775.45          |
| CARE DELIVERY                          | Voluntary blood donation                                                    | 43.38           |
|                                        | Storage capacity                                                            | 128.79          |
|                                        | Reliability of suppliers                                                    | 90.23           |
|                                        | Medication adherence                                                        | 64.41           |
|                                        | frequency requisition of drugs, needed materials and medical consumables    | 128.79          |
|                                        | Buffer stock of drugs , materials/consumables scheduling & monitoring       | 128.79          |
|                                        | Patients scheduling for treatment                                           | 243.06          |
|                                        | Routine monitoring                                                          | 600.3           |
|                                        | Documentation of well-aligned policies and procedures for clinical pathways | 439.21          |
|                                        | Capacity for expert diagnosis                                               | 417.47          |
|                                        | Following correct protocols of treatment                                    | 650.7           |
|                                        | Staff Workload                                                              | 251.19          |
|                                        | Cost- effectiveness system                                                  | 169.45          |
|                                        | Quality & safety controls                                                   | 505.33          |
|                                        | Quality culture orientation                                                 | 381.18          |
|                                        | Swiftness of Administrative Procedures                                      | 351.42          |
|                                        | Staff response speed                                                        | 563.1           |
|                                        | Time saving setup                                                           | 358.74          |
|                                        | Patient complaint handling                                                  | 578.76          |
|                                        | Entertainment activities                                                    | 52.8            |
| psychosocial support programs          | 166.09                                                                      |                 |
| Patients and family education programs | 161.46                                                                      |                 |
| patient feedback Surveys               | 291.36                                                                      |                 |
| <b>Total</b>                           |                                                                             | <b>14531.18</b> |

Regarding the overall importance weighting as shown in Table (5.3), the most significant technical specifications categories are: Staffing, Information and Service delivery. Eventually, the high and utmost on



priority list of technical requirements that should be improved and developed to satisfy the patients' priorities are:

- ❖ Staff training, education and development programs (923.7)
- ❖ Teamwork, knowledge and communication excellence skills level (883)
- ❖ Frequent patient contact and information exchange (775.5)
- ❖ Following correct protocols of treatment (650.7)
- ❖ Routine monitoring (600.3)
- ❖ Patient complaint handling (578.7)
- ❖ Staff response speed (563.1)
- ❖ Behavior and attitude of staff (555.2)
- ❖ Quality & safety controls (505.3)
- ❖ Documentation of well-aligned policies and procedures for clinical pathways (439.2)

Next part of this matrix was competitive technical benchmarking. To better understand the competition, a competitive technical assessment was conducted to compare the hospital's technical performance and its competitors' performance on each (HOW) from a technical perspective. This analysis illustrates the relative technical position of the existing

medical service and shows which hospital or competitor is better in adapting the correct technical specifications to satisfy the patient demands. It shows the strength and weakness of a particular hospital or competitor which can be improved by implementing the suitable methods to achieve the satisfaction of patients (Shrivastava and Verma, 2014). During this step, a scale from 1-5 was used to determine specific values about the technical performance achieved by competitors (WB hospitals, GS hospital and Dubai centre). These values were determined through interviews that conducted with professionals working in targeted hospitals, as illustrated previously in Chapters Three and Four; and they depicted graphically as shown in Appendix D. Large numbers indicate that the hospital has an excellent technical performance; small numbers indicate that the hospital has a poor technical performance.

After prioritizing the technical requirements and assessing technical competitiveness, the final output of the HOQ was a set of the desired target values for the technical requirements that are defined to achieve patient satisfaction. These are also called “HOW MUCHs” of the technical “HOWs” items. Desired target values are indications as to the degree of performance of the technical requirements to satisfy patient requirements. In other words, a target for a HOW represents a level of performance or guidance on the HOW the hospital believes is required to be achieved for its service to become competitive in the market as well as objectively measure progress (Alrabghi, 2013). The targets can act as a baseline against which to compare. A goal for a technical requirement should be set high to

increase the level of patient satisfaction with respect to competitors; likewise if hospital performance on this HOW is weak compared with the performance of its competitors' services or if this HOW has initially high relative importance (meaning high impact on the patient requirement). These goals are specific and measurable. Further, the targets should be reasonable based on the hospital's technical resources (Alrabghi, 2013).

Accordingly, the desired target values determined taking into account the hospital difficulty, both absolute and relative importance of each requirement, the competitors' performance and the hospitals current performance. It was needed to draw on all this information when deciding on these values, in addition the measurement units and scales need used. For example as shown in Table 5-3: the desired measurable targets for improving these following service quality specifications 'having multi-disciplinary doctors' and 'hiring enough full-time staff' are: hiring at least 1 full-time doctor in each unit with 4 personnel; with at least 5 years experience in thalassemia field in addition recruiting hematologists and work as a team with other specialists. These were determined regarding to the patients' priorities of those aspects besides the benchmarking results that indicated the Dubai center have 7 hematologists and large number of staff nurses besides psychologist and social worker all working as a team. Similarly, in Gaza; there are 5 hematologists with 10-15 years experience; while most hospitals in West Bank argued that there is a shortage of hematologists besides no full-time doctors to the point that; in needed cases a doctor has been called from other departments.

The related degree of difficulty in achieving the desired target value is also determined. In some cases, WB hospitals are not able to create the most optimum design because of constraints related to cost, technology, capabilities, capacity and political situation. WB hospitals difficulties are determined based on the WB hospitals professionals' expert judgments gathered through interviews as mentioned above, based on a scale from 1-5. Large numbers indicate that it is very difficult to WB hospitals to develop and improve certain requirement; small numbers indicates that it is very easy to WB hospitals to develop and improve certain requirement.

It was observed these difficulties as presented in HOQ are: 'having multi-disciplinary doctors in the hospital', 'staff motivation skill level', 'having enough equipments and treatment supplies at point of care', 'reliability of suppliers', 'following correct protocols of treatment' and 'patients and family education programs'. After completing all these phases the HOQ model is now ready to use it within the planning and improvement of healthcare services provided for thalassemia patients in Palestinian hospitals. The final HOQ model is shown in the appendix D.

**Chapter Six**  
**Conclusions and**  
**Recommendations**

## **Chapter Six**

### **Conclusions and Recommendations**

#### **1.6 Chapter Overview**

This chapter finalizes the thesis by providing conclusions of the research, recommendations to the healthcare industry practitioners and suggestions for future research.

#### **6.2 Conclusions**

This thesis aims to apply a holistic QFD model in order to improve the medical services quality provided to thalassemia patients in Palestine to meet their needs and exceed their satisfaction. This has been done by; firstly: listening to the voice of patients and exploring the critical patients' requirements that have been translated into meaningful technical characteristics and finding the priorities of these requirements using HOQ matrix. The modified version of SERVQUAL was used. It has been found that the 'Availability & Accessibility', 'Responsiveness' and 'Assurance' dimensions were the most important SERVQUAL dimension for the thalassemia patients in WB besides GS.

The second issue that the research focused on; is investigating the current situation of the medical services provided to thalassemia patients in Palestinian hospitals, measuring the level of patient satisfaction with the services and assessing the hospitals' service quality performance from the viewpoints of patients through benchmarking the best practices among three selected competitors: WB hospitals, GS hospital and Dubai

thalassemia center. It has been found that the GS hospital needs to enhance all patients' requirements because in all cases, patients' evaluations are under average and lagging behind the competitors especially in the service dimension of Availability and Accessibility. Further, WB hospitals performed better in Assurance and Tangibility but weaker in responsiveness and empathy.

Furthermore, other factors related to the patients' characteristics may influence a patient's assessment of hospital performance have been included and tested. The results outlined that there are no significant differences between participants according to their: gender, age, education level and having a job in all targeted hospitals, while found statistical differences according to hospital locations, monthly income and health status of patients. In addition, it was found that there is a positive correlation between all SERVQUAL dimensions with each other in all targeted hospitals. Based on the data collected and all results obtained from calculations and data analysis, this study concludes to establish the QFD models as well as six step-by-step matrices of HOQ have been constructed. It has been found that the 'Staffing' and 'Service delivery' were the most significant technical activities categories. At the end, the desired target values have been determined to achieve patient satisfaction. In conclusion, HOQ has demonstrated those following results:

- ✓ Almost all of the requirements of medical services are important from patients' point of view and have a mean rating greater than 3 on the five-point scale.

- ✓ The weakest performance in the Palestinian hospitals according to the patients' requirements that unmet patients expectations are: 'transferring system for treating abroad & coverage costs & follow-up', 'getting feedback from patients', 'sincere care to solve the patients' problems', 'having multidisciplinary team', 'modern, update medical supplies and equipment' and 'psychosocial, emotional support'.
- ✓ The most important technical requirements that should be improved and developed to satisfy the patients' priorities are: 'staff training, education and development programs', followed by 'teamwork, knowledge and communication excellence skills level', 'frequent patient contact and information exchange', 'following correct protocols of treatment', 'routine monitoring', 'patient complaint handling', 'staff response speed', 'behavior and attitude of staff', 'quality and safety controls', 'documentation of well-aligned policies and procedures for clinical pathways', 'hiring Enough full-time doctors/staff' and 'capacity for expert diagnosis'.
- ✓ The best performance in Palestinian hospitals according to the technical requirements are: 'quality culture orientation', 'voluntary blood donation', 'closeness of facility location', 'hygiene and cleanness of facility', 'excellent housekeeping' while the weakest performance found in 'staff motivation skill level (incentives)', 'psychosocial support programs' and 'patients and family education



programs' for both WB and GS. On the other hand, the 'staff empowerment and involvement in decision making' and 'having Multi-disciplinary doctors in the hospital' is the weakest in WB while the 'staff training, education and development programs' is the weakest in GS.

### **6.3 Research Contributions**

This research contributes to the literature by introducing a powerful and helpful managerial planning tool to support the successful implementation of TQM in the healthcare system in Palestine; so far achieves its competitive advantage in the Palestinian healthcare service industry. This study is one of the recent studies and may be considered one of the first; applying QFD model in healthcare sector in Palestine, where the research results have demonstrated that, although QFD was traditionally developed to assist product design, with some modifications the QFD technique could be applied in service industry even in labour intensive establishments such as hospitals.

This thesis has presented a unique QFD application which aims to increase the enhancement of quality healthcare delivery for thalassemia patients in Palestine and assist to provide guidelines for a nationwide and government-led encouragement on the provision of total quality healthcare to thalassemia patients. Further, this empirical study has a significant contribution to support the Palestinian Ministry of Health in developing

strategies and in the enactment of regulations and public policies for the promoting healthcare quality provided for thalassemia patients.

In addition, a unique feature of the proposed methodology is the employment of the SERVQUAL structure for identifying the key requirements of thalassemia patients. The study has demonstrated that the integrated usage of two methods gives a systematic and efficient approach in translating patients' needs into technical requirements and creates some methodological and practical advantages. In this context, the approach provides hospitals with a deep understanding of their service quality levels from patients' satisfaction perspective, identifying the relevant factors related to QFD process and highlighting the most important requirements which are highly attractive for their patients. This approach helps hospitals to develop innovative ideas in both strategic and tactical point-of-views. Moreover, the research gives a clear investigation of the current situation of the medical services provided to thalassemia patients in many governmental hospitals reside at WB, GS and Dubai and gives an assessment for service quality performance in the hospitals along the SERVQUAL besides that it applies the competitive benchmarking analysis to detect strengths and weaknesses in the performance for each hospital. The researchers in these selected locations can benefit upon this study and applying the same methodology separately.

#### **6.4 Recommendations**

This study has shown that hospitals with high level of medical services quality for thalassemia patients are more likely to have higher

patients' satisfaction. Thus, the study proposes a set of recommendations to the healthcare industry practitioners to improve their quality management performance:

1. Developing public policies and formulating strategies concerning thalassemia disease and to be included within action plans of national health strategy in Palestinian MOH for the advancement of the healthcare quality provided to thalassemia patients.
2. Patients' points of view about the health services are very important to consider when intending any improvement in the health sector.
3. Adopting the centralization approach in healthcare provision to thalassemia patients and attempting to establish an integrated specialized center for blood disorders. This approach is more cost-effective, offers better access to services and can make diagnosis more accurate.
4. Adopting the competitive benchmarking analysis in QFD model which affords to exchange and take advantage of experiences of other areas and countries in the thalassemia management.
5. Patients' feedback surveys should be carried out routinely in all aspects of healthcare to improve quality of services. If a hospital had to collect regularly this type of information, it would provide clinicians, management and trustees with focused usable information about areas in which care could be improved.

6. Decision makers and top managers must be aware about the positive impacts of quality improvement of the healthcare provision for thalassemia (especially from financial aspects) and actively participate in its implementation rather than resist it.
7. Introducing valid quality measures or key performance indicators whether based on process or outcomes of care; in order to keep tracking the quality level of health care.
8. The importance and necessity of requiring professionals and training the healthcare staff regarding the proper management protocols of the disease besides the empowering and involving them in decision-making process. This allows productive interaction among staff and gives opportunities to address problems smartly, through cross learning and knowledge transfer, and internal communications.
9. The improvement process of the healthcare quality provided to thalassemia patients; is a shared responsibility between the healthcare providers and patients due to how can they take appropriate responsibility for their own health. So it is important to empower the patients in decisions about their conditions and care decisions.

## **6.5 Limitations**

Although this research is considered relatively large in terms of its comprehensive nature, it does have some limitations. The challenges in applying the QFD started when searching for best-in-class hospitals outside

Palestine in order to competitive benchmarking analysis in addition the challenges associated with data collection; where gathered from different locations.

Other limitation faced this research inquiry is, the assigning measurable units and quantifiable scales to the service technical specifications, further the dealing with a huge amount of data and too many items in each side of the matrix; the matrix becomes large and hard to manage.

## **6.6 Future Research**

Future research can benefit from this study by expanding the scope from healthcare industry to other type of service industries in order to analyze the applicability of the proposed model; and applying the same methodology to other kinds of health services; such as medical clinics, clinical laboratories, and also the private hospitals besides to other type of diseases. Furthermore, it would also be helpful to conduct the same study in hospitals of other countries; such studies would enable inter-country comparison to be made. Further research can be improved upon the current research findings by employing a comparative study in a wider application in samples of governmental hospitals to get more validity regarding the patients' satisfaction levels and need assessment.

From the findings of this study it is recommended that future studies should be more focused toward integration of some existing tools in the

QFD literature such as: SEVQUAL structure, Kano model, fuzzy concept, AHP, etc ...; which could improve the functioning of traditional QFD.

To bring this research one step further, the financial side should be taken into consideration then the merits of the use of QFD through cost/benefit analysis can be evaluated. Moreover, whereas this research focused on the HOQ represented as the first phase of QFD, it is recommended future studies to extend beyond HOQ and develop the subsequent QFD phases. In this way, the research project would be more complete. Last but not least, this research proposes QFD model for MOH to adopt, there is a need for further study that evaluates and assesses the QFD performance and its validity in case it was applied by the hospitals.

***In the Last Word,***

***There is no Magic Formula to Success in the Quality Journey.***

***It is Hard Work, but it is Fun! (Sage and Rouse, 2009)***

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# Appendices

**Appendix (A)**

**Interview and Questionnaire**

**The interview**

**Al-Najah National University**

**Faculty of Graduate Studies**

**Engineering Management Program**



***Improvement of Available Medical Services Quality for Thalassemia  
Patients in Palestine***

**By**

**Aysha Sohail Atweh**

**This interview is submitted in Fulfillment of the Requirements for the  
Degree of Masters of Engineering Management, Faculty of Graduate  
Studies at An-Najah National University, Nablus- Palestine.**

**This interviews aims to answering the following questions:**

1. Could you please describe the current healthcare situation of thalassemia in the hospital?
2. Is there a specialized department for thalassemia in hospital?
3. Are you satisfied with the healthcare services provided by hospital?
4. What are the problems and obstacles that you face while receiving the medical services in hospital?
5. What are the needed requirements that thalassemia patient aspiring to get from the hospital?
6. Are you satisfied with provided drugs and tests by hospital? Why?
7. Are you satisfied with available information within hospital? Why?
8. Are you satisfied with available equipments and buildings within hospitals? Why?
9. Are you satisfied with current system within hospital for appointment and follow up? Why?
10. Are you satisfied with the medical staff performance in the diagnosis & treatment and in dealing with disease complications? Why?
11. What about staff behavior and attitudes?
12. What about the time of service delivery?
13. Is there a support from the hospital administration and staff to solve the patients' problems?

**Thank You**



## **Questionnaire about**

### **Quality of medical service provided to Thalassemia patients**

Dear patients,

After greeting, thank you for your cooperation and your patience, I highly appreciate your valuable efforts in supporting this scientific research.

A student researcher in engineering management master's program from An-Najah National University is working on a thesis entitled **"Improvement of Available Medical Services Quality for Thalassemia Patients in Palestine"** by knowing the level of patient satisfaction of the services provided.

Please kindly answer the questionnaire and select the appropriate answer; Note that all information provided will be treated confidentially, and all data will be used for academic research purpose only.

Researcher: Aysha Atweh

Email: aysheh\_atweh@hotmail.com

**Part One: Basic Information:****Answer questions**

This form is addressed to: Adult thalassemia patients and the Parents of thalassemia children


- 1- Gender:  Male  Female
- 2- Age:  Less than 15 years  15-25 years  
 26-36 years  More than 37 years
- 3- Level of education:  Primary  Secondary  
 Diploma  Bachelor  Master and more
- 4- Do you have a job?  Yes  No
- 5- Monthly income of the family NIS  Under 1500 NIS  1500 – 3000  
 More than 3000 NIS
- 6- Hemoglobin level (According the last test)  Less than 7  [7.1 - 8.9]  
 [9 - 10.9]  More than 11
- 7- Ferritin level (According the last test)  Less than 1000  1000 - 2999  
 3000- 4999  More than 5000

**Part Two: Patients' Requirements Questionnaire**

The table below includes a list of main requirements that thalassemia patient aspiring to get from the hospital, please: **First:** mark just one appropriate box that shows how much you agree with the following statements. **Second:** choose a value "5-1" for each requirement to indicate how important this element to you; based on your own perceptions and preference, so that:

**5= most important**      **4= important**      **3=natural**      **2= least important**  
**1= not important**



| Measure        | Patients' Requirements |                                                                                                                                  | Strongly Agree | Agree | Natural | I Don't Agree | Strongly Disagree | Importance degree for you Choose No.                                                |
|----------------|------------------------|----------------------------------------------------------------------------------------------------------------------------------|----------------|-------|---------|---------------|-------------------|-------------------------------------------------------------------------------------|
|                |                        |                                                                                                                                  |                |       |         |               |                   |  |
| Tangibility    | 15.                    | Modern ,update medical supplies and equipment                                                                                    |                |       |         |               |                   |                                                                                     |
|                | 16.                    | Clean and comfortable environment in healthcare center                                                                           |                |       |         |               |                   |                                                                                     |
|                | 17.                    | Neat and professional appearance of doctors/staff                                                                                |                |       |         |               |                   |                                                                                     |
|                | 18.                    | Appropriate physical facilities (buildings and equipment) for the type of medical service                                        |                |       |         |               |                   |                                                                                     |
|                | 19.                    | Confidentiality and privacy during treatment                                                                                     |                |       |         |               |                   |                                                                                     |
| Reliability    | 20.                    | Carrying out the medical services correctly at the first time (blood / tests / drugs /diagnostics / etc ...)                     |                |       |         |               |                   |                                                                                     |
|                | 21.                    | Providing medical services at the appointed time ( no delay)                                                                     |                |       |         |               |                   |                                                                                     |
|                | 22.                    | Doctors/staff are professional and competent                                                                                     |                |       |         |               |                   |                                                                                     |
|                | 23.                    | Continued training of doctors/ staff on the modern ways                                                                          |                |       |         |               |                   |                                                                                     |
|                | 24.                    | Sincere care to solve the patients' problems                                                                                     |                |       |         |               |                   |                                                                                     |
|                | 25.                    | Keeping accurate, documented and fast retrieval medical records                                                                  |                |       |         |               |                   |                                                                                     |
|                | 26.                    | Systematic follow up and supervision of the healthcare staff, not the frequent rotation one                                      |                |       |         |               |                   |                                                                                     |
|                | 27.                    | Informing patients accurately how medical services will be performed                                                             |                |       |         |               |                   |                                                                                     |
|                | 28.                    | Accurate diagnosis of the disease and its complications                                                                          |                |       |         |               |                   |                                                                                     |
|                | 29.                    | Keening of doctors to give sufficient time to examine the patient and give medical instructions                                  |                |       |         |               |                   |                                                                                     |
| Responsiveness | 30.                    | Doctors/staff always willing to help patients                                                                                    |                |       |         |               |                   |                                                                                     |
|                | 31.                    | Informing patients precisely when medical services will be performed                                                             |                |       |         |               |                   |                                                                                     |
|                | 32.                    | Prompt response to patients' requests and take immediately actions in emergent cases resulting from complications of the disease |                |       |         |               |                   |                                                                                     |



| Measure   | Patients' Requirements |                                                                                                     |  |  |  | Strongly Agree | Agree | Natural | I Don't Agree | Strongly Disagree | Importance degree for you Choose No.<br>① ② ③ ④ ⑤ |
|-----------|------------------------|-----------------------------------------------------------------------------------------------------|--|--|--|----------------|-------|---------|---------------|-------------------|---------------------------------------------------|
|           |                        |                                                                                                     |  |  |  |                |       |         |               |                   |                                                   |
|           | 33.                    | Easy access to doctors/staff when needed                                                            |  |  |  |                |       |         |               |                   |                                                   |
|           | 34.                    | Reducing waiting time for delivered medical service                                                 |  |  |  |                |       |         |               |                   |                                                   |
| Assurance | 35.                    | Instilling confidence and trust in the patient through staff's behavior                             |  |  |  |                |       |         |               |                   |                                                   |
|           | 36.                    | Friendly, trustworthy and courteous doctors/ staff and having good communication with the patient   |  |  |  |                |       |         |               |                   |                                                   |
|           | 37.                    | Feeling secured and safe in receiving healthcare                                                    |  |  |  |                |       |         |               |                   |                                                   |
|           | 38.                    | Using medical equipment safely ,quickly and skillfully                                              |  |  |  |                |       |         |               |                   |                                                   |
|           | 39.                    | Treating the patient with respect and dignity                                                       |  |  |  |                |       |         |               |                   |                                                   |
|           | 40.                    | Possessing doctors/staff a wide spectrum of knowledge to answer patients' questions                 |  |  |  |                |       |         |               |                   |                                                   |
| Empathy   | 41.                    | Creating an atmosphere of fun and making efforts to help the patient receives treatment comfortably |  |  |  |                |       |         |               |                   |                                                   |
|           | 42.                    | Giving individual attention to each patient                                                         |  |  |  |                |       |         |               |                   |                                                   |
|           | 43.                    | Having patient' best interest at heart                                                              |  |  |  |                |       |         |               |                   |                                                   |
|           | 44.                    | Paying attention to the feelings of the patient and his family and easing their pain                |  |  |  |                |       |         |               |                   |                                                   |
|           | 45.                    | Psychosocial and emotional support and non-marginalization and negligence                           |  |  |  |                |       |         |               |                   |                                                   |
|           | 46.                    | Encouraging self-care and compliance with treatment                                                 |  |  |  |                |       |         |               |                   |                                                   |
|           | 47.                    | Getting feedback from patients                                                                      |  |  |  |                |       |         |               |                   |                                                   |
|           | 48.                    | Understanding specific needs of patients                                                            |  |  |  |                |       |         |               |                   |                                                   |

**Thanks for your corporation**



## استبيان حول جودة الخدمات الطبيه المقدمه لمرضى التلاسيميا

عزيزي/عزيزتي المريض/ة:

بعد التحية ، اتقدم بجزيل الشكر للمساهمه بجزء من وقتكم وجهدكم لتعبئة هذا الاستبيان

تسعى الباحثة وهي طالبة في برنامج ماجستير الادارة الهندسيه من جامعة النجاح الوطنيه بعمل دراسه بعنوان " تطوير جودة توفير الخدمات الطبيه المقدمه لمرضى التلاسيميا في فلسطين" من خلال قياس مستوى رضا المرضى عن الخدمات المقدمه، امين ان تؤدي هذه النتائج الى تحسين جوده الخدمات الطبيه وتحقيق التميز في تقديم الرعاية الصحيه لمرضى التلاسيميا في فلسطين .

الرجاء من حضرتكم التكرم بتقديم المساعدة من خلال تعبئة هذا الاستبيان والاجابة عن الاسئلة بكل موضوعيه وحياديه ، مؤكداين لكم ان مايحويه الاستبيان من معلومات لن تستخدم الا لاغراض البحث العلمي فقط وسوف يتم التعامل معها ببدأ السريه التامه .

الباحثة : عائشه عطوه

### الجزء الاول: معلومات عامه

الاجابه عن اسئله الاستبيان :

هذه الاستماره موجهه الى كل من : مرضى التلاسيميا  
البالغين واهالي مرضى التلاسيميا الاطفال

1- الجنس

( ) ذكر ( ) انثى

2- العمر

( ) اقل من 15 سنه ( ) 15 - 25 سنه ( ) 26 - 36 سنه ( ) 37سنه فاكثر

3- المستوى التعليمي

( ) ابتدائي ( ) ثانوي ( ) دبلوم ( ) بكالوريوس

( ) ماجستير فاعلى

4- هل تعمل او لديك وظيفة ما ؟

( ) نعم ( ) لا

5- الدخل الشهري (للعائلة)

( ) اقل من 1500 شيكل ( ) من 1500-3000 شيكل ( ) اعلى من 3000 شيكل

6- مستوى الدم (حسب اخر فحص)

( ) اقل من 7 ( ) [ 8.9 - 7.1 ] ( ) [ 9 - 10.9 ] ( ) 11 فاكثر

7- مستوى الحديد (حسب اخر فحص)

( ) اقل من 1000 ( ) 1000 - 2999 ( ) 3000 - 4999 ( ) 5000 فاكثر

### الجزء الثاني : استبيان متطلبات المريض

يشمل الجدول التالي على قائمة من المتطلبات الرئيسية التي يطمح أي مريض ثلاثيميا

للحصول عليها من المستشفى، يرجى :

(1) - وضع اشارة (x) في المكان المناسب الذي يدل على مدى موافقتك على العبارات التالية  
(راضي عنه ام غير راضي)

(2) - بالاضافه الى وضع قيمه من 1- 5 لكل متطلب حسب أهميته بالنسبة لك ، بحيث أن :

5=مهم كثيرا 4=مهم 3=متوسط 2=مهم قليلا 1=غير مهم

| المجال               | متطلبات المريض                                                                                                                                                                                                          | موافق بشده | موافق | متوسط | معارض | معارض بشده | كم هو مهم هذا العنصر بالنسبة لك؟؟ |
|----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|-------|-------|-------|------------|-----------------------------------|
|                      |                                                                                                                                                                                                                         |            |       |       |       |            | 5 4 3 2 1                         |
| التوفر وسهولة الوصول | 1. تعمل ادارة المستشفى على/ توفير وحدة يوميه منفصله وخاصه لمرضى التلاسيميا                                                                                                                                              |            |       |       |       |            |                                   |
|                      | 2. تعمل ادارة المستشفى على/ توفير وحدات الدم اللازمه مفلتره وامنه وذات جوده عاليه "داخل المستشفى"                                                                                                                       |            |       |       |       |            |                                   |
|                      | 3. تلتزم ادارة المستشفى/ بتوفير الادويه الضروريه والمستلزمات الطبيه بشكل دائم دون انقطاع داخل صيدلة المستشفى مثل: فلاتر الدم ، مضخة الديسفرال ، الاكسجيد..... وغيرها من الادويه (هل تحتاج لشراء ادويه من خارج المستشفى) |            |       |       |       |            |                                   |
|                      | 4. تعمل ادارة المستشفى على/ توفير طاقم طبي متعدد التخصصات مؤلف من : اخصائي دم، ممرضات ، اخصائي نفسي ، اخصائي اجتماعي                                                                                                    |            |       |       |       |            |                                   |
|                      | 5. تعمل ادارة المستشفى على/ توفير الفحوصات المخبريه اللازمه بشكل دوري داخل المستشفى [الحديد، الهرمونات، هشاشة العظام، الكبد الفيروسي، القلب.... وغيرها من الفحوصات] (هل تحتاج لعمل فحوصات في مختبرات خاصه)              |            |       |       |       |            |                                   |
|                      | 6. تعمل ادارة المستشفى على/ توفير عدد كافي من : الاطباء/ والعاملين/ والمعدات/ والاسره/ مقابل اعداد المرضى                                                                                                               |            |       |       |       |            |                                   |
|                      | 7. تهتم ادارة المستشفى/ بتوفير نظام معلومات وقاعدة بيانات شاملة عن المريض وحالته الصحيه                                                                                                                                 |            |       |       |       |            |                                   |
|                      | 8. تولي ادارة المستشفى/ الاهتمام بتسهيل الوصول الى موقع المركز الصحي وتكلفة المواصلات                                                                                                                                   |            |       |       |       |            |                                   |
|                      | 9. تعمل ادارة المستشفى على/ تسهيل الاجراءات والتحويلات الداخليه للعيادات الاخرى                                                                                                                                         |            |       |       |       |            |                                   |
|                      | 10. تعمل ادارة المستشفى على/ تسهيل الحصول على العلاج الطبي في الطوارئ                                                                                                                                                   |            |       |       |       |            |                                   |

|  |  |  |  |  |                                                                                                                                                |     |                          |
|--|--|--|--|--|------------------------------------------------------------------------------------------------------------------------------------------------|-----|--------------------------|
|  |  |  |  |  | تلتزم ادارة المستشفى/ بتوفير العلاج والعناية اللازمه والسماح بالدخول والمبيت بالمستشفى عند الحاجه                                              | 11. |                          |
|  |  |  |  |  | تهتم ادارة المستشفى /بتوفير التأمين الصحي المجاني لتغطية تكاليف العلاج والفحوصات الطبيه والعمليات الجراحيه                                     | 12. |                          |
|  |  |  |  |  | تعمل ادارة المستشفى بساعات دوام كافية تتلائم مع احتياجات المرضى                                                                                | 13. |                          |
|  |  |  |  |  | تعمل ادارة المستشفى على/ تسهيل نظام التحويلات للعلاج بالخارج (عمليات زرع النخاع) وتغطية التكاليف المرتفعه لها/ وتوفير العلاج/ والمتابعه الخاصه | 14. |                          |
|  |  |  |  |  | تقوم ادارة المستشفى/ بتوفر الاجهزه والمستلزمات الطبيه حديثه ومتطوره (ام قديمه وتحتاج لتطوير)                                                   | 15. |                          |
|  |  |  |  |  | تلتزم ادارة المستشفى/ بالمحافظة على بيئة مركز الرعاية نظيفه ومريحه (تعقيم المعدات، نظافة الاسره والشراشف والممرات)                             | 16. | الجوانب المادية الملموسة |
|  |  |  |  |  | تهتم ادارة المستشفى/ بطريقة وهيئة ملابس العمل للطباء والطاقم الطبي                                                                             | 17. |                          |
|  |  |  |  |  | تعمل ادارة المستشفى على/ ملائمة المرافق الماديه (المباني والتجهيزات) لنوع الخدمه الطبيه (هل بحاجه الى توسيع وتحسين مبنى الوحده)                | 18. |                          |
|  |  |  |  |  | تحرص ادارة المستشفى على/ السريه والمحافظة على الخصوصيه اثناء العلاج                                                                            | 19. |                          |
|  |  |  |  |  | تلتزم ادارة المستشفى/ بتقديم الخدمات الطبيه بشكل صحيح من المره الاولى وعدم وجود اخطاء (الدم /الفحوصات / الادويه/ التشخيص/... الخ)              | 20. | الاعتمادية               |
|  |  |  |  |  | تلتزم ادارة المستشفى/ بتقديم الخدمات الطبيه في الوقت المحدد المتفق عليه والالتزام بالمواعيد (هل هناك تاخير )                                   | 21. |                          |
|  |  |  |  |  | تعمل ادارة المستشفى على/ توفير اطباء وطاقم الطبي متخصص وذو خبره عاليه                                                                          | 22. |                          |

|  |  |  |  |  |                                                                                                                            |     |               |
|--|--|--|--|--|----------------------------------------------------------------------------------------------------------------------------|-----|---------------|
|  |  |  |  |  | تعمل ادارة المستشفى على/ استمرار تدريب<br>الاطباء والطاقم الطبي على احدث الوسائل                                           | 23. |               |
|  |  |  |  |  | تهتم ادارة المستشفى/ بحل مشاكل المرضى<br>وسماع شكاويهم                                                                     | 24. |               |
|  |  |  |  |  | تلتزم ادارة المستشفى/ بالاحتفاظ بسجلات طبيه<br>دقيقة وموثقة وسهلة الاسترجاع                                                | 25. |               |
|  |  |  |  |  | تعمل ادارة المستشفى على/ المتابعه والاشراف<br>المنتظم على الرعايه الصحيه وعدم كثرة تناوب<br>العاملين                       | 26. |               |
|  |  |  |  |  | تلتزم ادارة المستشفى/ باخبار المرضى بدقة<br>كيفية تنفيذ الخدمه الطبيه (تشرح لك حالتك<br>الصحيه وكيف ستعالجك)               | 27. |               |
|  |  |  |  |  | تهتم ادارة المستشفى/ بدقة التشخيص الطبي<br>للمرض ومضاعفاته                                                                 | 28. |               |
|  |  |  |  |  | تلتزم ادارة المستشفى /بفحص المريض واعطاء<br>الوقت الكافي لفحصه واعطائه التعليمات الطبيه<br>وشرح واضح عن حالته              | 29. |               |
|  |  |  |  |  | تحرص ادارة المستشفى على/ استعداد العاملين<br>دوما لمساعدة المريض                                                           | 30. | الاستجابة     |
|  |  |  |  |  | تلتزم ادارة المستشفى/ بابلاغ المرضى بشكل<br>محدد عن اوقات تقديم الخدمه (يتم ابلاغك ام انت<br>يجب ان تسال )                 | 31. |               |
|  |  |  |  |  | تقوم ادارة المستشفى/ بالاستجابة السريعه لطلبات<br>المرضى واتخاذ اجراءات مباشره في اي حالة<br>طارئه ناتجة عن مضاعفات المرض  | 32. |               |
|  |  |  |  |  | تهتم ادارة المستشفى /بتمكين الوصول الى<br>الاطباء والعاملين عند الحاجه                                                     | 33. |               |
|  |  |  |  |  | تهتم ادارة المستشفى/ بتقليل وقت انتظار<br>المريض للحصول على الخدمه الطبيه وعدم<br>تاخيرها ( الدم، نتائج الفحوصات،، وغيرها) | 34. |               |
|  |  |  |  |  | تعمل ادارة المستشفى على/ غرس الثقه<br>والطمأنينه في نفس المريض من قبل الاطباء<br>والعاملين                                 | 35. | الامان والثقة |

|  |  |  |  |  |                                                                                                          |     |         |
|--|--|--|--|--|----------------------------------------------------------------------------------------------------------|-----|---------|
|  |  |  |  |  | تولي ادارة المستشفى /الاهتمام بلباقة وحسن خلق<br>الاطباء والعاملين وايجاد لغة تفاهم وتواصل مع<br>المريض  | 36. |         |
|  |  |  |  |  | تلتزم ادارة المستشفى / بتامين السلامة والشعور<br>بالامان في تلقي الرعاية الصحيه                          | 37. |         |
|  |  |  |  |  | تعمل ادارة المستشفى على/ استخدام المعدات<br>الطبية بأمان وسرعه ومهاره                                    | 38. |         |
|  |  |  |  |  | تحرص ادارة المستشفى على ان/ يتم علاج<br>المريض باحترام وكرامه                                            | 39. |         |
|  |  |  |  |  | تعمل ادارة المستشفى على ان/ يمتلك الاطباء<br>والعاملين معرفه الكافيه للاجابة على اسئلة<br>المرضى         | 40. |         |
|  |  |  |  |  | تعمل ادارة المستشفى على/ خلق جو من المرح<br>والتسلية وبذل جهد لجعل المريض يتلقي خدمة<br>العلاج بشكل مريح | 41. | التعاطف |
|  |  |  |  |  | تلتزم ادارة المستشفى/ باعطاء الاهتمام الفردي<br>لكل مريض                                                 | 42. |         |
|  |  |  |  |  | تضع ادارة المستشفى مصلحة المرضى في<br>صلب اهتمامها قلبا وقالبا                                           | 43. |         |
|  |  |  |  |  | تهتم ادارة المستشفى بمشاعر المريض وعائلته<br>وتخفيف الالم عنهم                                           | 44. |         |
|  |  |  |  |  | تقوم ادارة المستشفى/ بتقديم الدعم النفسي<br>والاجتماعي وتمنع التهميش والاهمال                            | 45. |         |
|  |  |  |  |  | تعمل ادارة المستشفى على/ تشجيع الرعاية<br>الذاتيه والالتزام بالعلاج                                      | 46. |         |
|  |  |  |  |  | تعمل ادارة المستشفى على/ الحصول على تقييم<br>من المرضى عن رضاهم عن الخدمة الطبية بعد<br>تلقيها           | 47. |         |
|  |  |  |  |  | تعمل ادارة المستشفى على فهم احتياجات<br>المريض الخاصه                                                    | 48. |         |

## Appendix (B)

| Variable                  | Characteristic of the Variable | Frequency | Percentage % |
|---------------------------|--------------------------------|-----------|--------------|
| Hospital<br>s<br>Location | Dubai                          | 96        | 32.7 %       |
|                           | Gaza                           | 55        | 19 %         |
|                           | Nablus                         | 48        | 16.6 %       |
|                           | Ramallah                       | 17        | 5.9 %        |
|                           | Jinin                          | 34        | 11.8 %       |
|                           | Tulkarem                       | 16        | 5.5 %        |
|                           | Hebron                         | 25        | 8.7 %        |
|                           | Total                          | 291       | 100 %        |

### Tables

**Table (1): Distribution of Hospitals Location**

**Table (2): Personal characteristics distribution for first group (WB)**

| Variable         | Characteristic of the Variable | Frequency | Percentage % |
|------------------|--------------------------------|-----------|--------------|
| Gender           | Male                           | 70        | 50%          |
|                  | Female                         | 70        | 50%          |
| Age              | Less than 15 Years             | 36        | 25.7%        |
|                  | 15-25 years                    | 79        | 56.4%        |
|                  | 26-36 years                    | 20        | 14.3%        |
|                  | More than 37 years             | 5         | 3.6%         |
| Education level  | Primary                        | 59        | 42.1%        |
|                  | Secondary                      | 37        | 26.4%        |
|                  | Diploma                        | 19        | 13.6%        |
|                  | B.A                            | 25        | 17.9%        |
|                  | Master and more                | 0         | 0            |
| Having a Job     | Yes                            | 23        | 16.4%        |
|                  | No                             | 117       | 83.9%        |
| Monthly Income   | Under 1500 NIS                 | 57        | 40.7%        |
|                  | 1500-3000 NIS                  | 61        | 43.6%        |
|                  | More than 3000 NIS             | 22        | 15.7%        |
| Hemoglobin level | Less than 7                    | 25        | 17.9%        |
|                  | (7.1- 8.9)                     | 93        | 66.4%        |
|                  | (9.0-10.9)                     | 18        | 12.9%        |
|                  | More than 11                   | 4         | 2.9%         |
| Ferritin level   | Less than 1000                 | 23        | 16.4%        |
|                  | [1000-2999]                    | 65        | 46.4%        |
|                  | [3000-4999]                    | 32        | 22.9%        |
|                  | More than 5000                 | 20        | 14.3%        |
| Total            |                                | 140       | 100%         |



**Table (3): Personal characteristics distribution for second group (GS)**

| Variable         | Characteristic of the Variable | Frequency | Percentage % |
|------------------|--------------------------------|-----------|--------------|
| Gender           | Male                           | 28        | 50.9%        |
|                  | Female                         | 27        | 49.1%        |
| Age              | Less than 15 Years             | 10        | 18.2%        |
|                  | 15-25 years                    | 25        | 45.5%        |
|                  | 26-36 years                    | 16        | 29.1%        |
|                  | More than 37 years             | 4         | 7.3%         |
| Education level  | Primary                        | 12        | 21.8%        |
|                  | Secondary                      | 33        | 60%          |
|                  | Diploma                        | 8         | 14.5%        |
|                  | B.A                            | 2         | 3.6%         |
|                  | Master and more                | 0         | 0            |
| Having a Job     | Yes                            | 8         | 14.5%        |
|                  | No                             | 47        | 85.5%        |
| Monthly Income   | Under 1500 NIS                 | 27        | 49.1%        |
|                  | 1500-3000 NIS                  | 25        | 45.5%        |
|                  | More than 3000 NIS             | 3         | 5.5%         |
| Hemoglobin level | Less than 7                    | 3         | 5.5%         |
|                  | (7.1- 8.9)                     | 34        | 61.8%        |
|                  | (9.0-10.9)                     | 17        | 30.9%        |
|                  | More than 11                   | 1         | 1.8%         |
| Ferritin level   | Less than 1000                 | 4         | 7.4%         |
|                  | [1000-2999]                    | 8         | 14.5%        |
|                  | [3000-4999]                    | 24        | 43.6%        |
|                  | More than 5000                 | 19        | 34.5%        |
| Total            |                                | 55        | 100%         |

**Table (4): Personal characteristics distribution for third group (DB)**

| Variable        | Characteristic of the Variable | Frequency | Percentage % |
|-----------------|--------------------------------|-----------|--------------|
| Gender          | Male                           | 46        | 47.9%        |
|                 | Female                         | 50        | 52.1%        |
| Age             | Less than 15 Years             | 23        | 24%          |
|                 | 15-25 years                    | 42        | 43.8%        |
|                 | 26-36 years                    | 29        | 30.2%        |
|                 | More than 37 years             | 2         | 2.1%         |
| Education level | Primary                        | 26        | 27.1%        |
|                 | Secondary                      | 45        | 46.9%        |
|                 | Diploma                        | 12        | 12.5%        |
|                 | B.A                            | 13        | 13.5%        |
|                 | Master and more                | 0         | 0            |
| Having a        | Yes                            | 26        | 27.1%        |

|                  |                     |    |       |
|------------------|---------------------|----|-------|
| Job              | No                  | 70 | 72.9% |
| Monthly Income   | Under 5000 AED      | 24 | 25%   |
|                  | 5000-15000 AED      | 39 | 40.6% |
|                  | More than 15000 AED | 28 | 34.4% |
| Hemoglobin level | Less than 7         | 4  | 4.2%  |
|                  | (7.1- 8.9)          | 30 | 31.3% |
|                  | (9.0-10.9)          | 61 | 63.5% |
|                  | More than 11        | 1  | 1%    |
| Ferritin level   | Less than 1000      | 26 | 27.1% |
|                  | [1000-2999]         | 49 | 51%   |
|                  | [3000-4999]         | 16 | 16.7% |
|                  | More than 5000      | 5  | 5.2%  |
| Total            |                     | 96 | 100%  |

**Table (5): Descriptive of Statistical Differences among (West Bank) Participants According to their Hospital Location**

| Factor                     | Hospital location | N   | Mean   | Std. Deviation | Std. Error | 95% Confidence Interval for Mean |             | Min  | Max  |
|----------------------------|-------------------|-----|--------|----------------|------------|----------------------------------|-------------|------|------|
|                            |                   |     |        |                |            | Lower Bound                      | Upper Bound |      |      |
| Total SERVQUAL Performance | Ramallah          | 17  | 3.6210 | .70109         | .17004     | 3.2606                           | 3.9815      | 2.88 | 4.93 |
|                            | Nablus            | 48  | 3.7289 | .65574         | .09465     | 3.5385                           | 3.9193      | 1.96 | 4.95 |
|                            | Jenin             | 34  | 3.5040 | .65796         | .11284     | 3.2744                           | 3.7336      | 2.45 | 4.69 |
|                            | Tulkarem          | 16  | 4.2667 | .33479         | .08370     | 4.0883                           | 4.4451      | 3.90 | 4.81 |
|                            | Hebron            | 25  | 2.7536 | .54276         | .10855     | 2.5295                           | 2.9776      | 2.07 | 3.73 |
|                            | Total             | 140 | 3.5485 | .74372         | .06286     | 3.4242                           | 3.6728      | 1.96 | 4.95 |
| Total Importance           | Ramallah          | 17  | 4.4373 | .50459         | .12238     | 4.1779                           | 4.6967      | 3.11 | 5.00 |
|                            | Nablus            | 48  | 4.5942 | .36248         | .05232     | 4.4889                           | 4.6994      | 3.71 | 5.33 |
|                            | Jenin             | 34  | 4.2337 | .61168         | .10490     | 4.0203                           | 4.4471      | 2.96 | 5.00 |
|                            | Tulkarem          | 16  | 4.5177 | .31781         | .07945     | 4.3483                           | 4.6870      | 4.13 | 4.99 |
|                            | Hebron            | 25  | 4.5453 | .35915         | .07183     | 4.3971                           | 4.6936      | 3.67 | 5.00 |
|                            | Total             | 140 | 4.4701 | .46490         | .03929     | 4.3924                           | 4.5478      | 2.96 | 5.33 |

**Table (6): Descriptive of Statistical Differences among (West Bank) Participants According to their Monthly Income**

| Factor           | Monthly Income     | N   | Mean   | Std. Deviation | Std. Error | 95% Confidence Interval for Mean |             | Min  | Max  |
|------------------|--------------------|-----|--------|----------------|------------|----------------------------------|-------------|------|------|
|                  |                    |     |        |                |            | Lower Bound                      | Upper Bound |      |      |
| Total importance | Under 1500 NIS     | 57  | 4.5734 | .36278         | .04805     | 4.4772                           | 4.6697      | 3.31 | 5.33 |
|                  | 1500-3000 NIS      | 61  | 4.3536 | .54970         | .07038     | 4.2128                           | 4.4944      | 2.96 | 5.00 |
|                  | More than 3000 NIS | 22  | 4.5255 | .38034         | .08109     | 4.3568                           | 4.6941      | 3.79 | 5.00 |
|                  | Total              | 140 | 4.4701 | .46490         | .03929     | 4.3924                           | 4.5478      | 2.96 | 5.33 |

**Table (7): Descriptive of Statistical Differences among (West Bank) Participants According to their Ferritin Level**

| Factor           | Ferritin Level | N   | Mean   | Std. Deviation | Std. Error | 95% Confidence Interval for Mean |             | Min  | Max  |
|------------------|----------------|-----|--------|----------------|------------|----------------------------------|-------------|------|------|
|                  |                |     |        |                |            | Lower Bound                      | Upper Bound |      |      |
| Total Importance | Less than 1000 | 23  | 4.6010 | .31870         | .06645     | 4.4632                           | 4.7388      | 3.85 | 5.00 |
|                  | [1000-2999]    | 65  | 4.4256 | .49169         | .06099     | 4.3038                           | 4.5474      | 3.11 | 5.00 |
|                  | [3000-4999]    | 32  | 4.3245 | .52581         | .09295     | 4.1349                           | 4.5141      | 2.96 | 4.99 |
|                  | More than 5000 | 20  | 4.6972 | .28396         | .06350     | 4.5643                           | 4.8301      | 4.13 | 5.33 |
|                  | Total          | 140 | 4.4701 | .46490         | .03929     | 4.3924                           | 4.5478      | 2.96 | 5.33 |

**Table (8): Descriptive of Statistical Differences among (Gaza) Participants According to their Monthly Income**

| Factor                     | Monthly Income     | N  | Mean   | Std. Deviation | Std. Error | 95% Confidence Interval for Mean |             | Min  | Max  |
|----------------------------|--------------------|----|--------|----------------|------------|----------------------------------|-------------|------|------|
|                            |                    |    |        |                |            | Lower Bound                      | Upper Bound |      |      |
| Total SERVQUAL Performance | Under 1500 NIS     | 27 | 2.6101 | .45908         | .08835     | 2.4285                           | 2.7917      | 1.88 | 4.07 |
|                            | 1500-3000 NIS      | 25 | 2.7492 | .43006         | .08601     | 2.5716                           | 2.9267      | 1.94 | 3.56 |
|                            | More than 3000 NIS | 3  | 3.4685 | .68673         | .39648     | 1.7626                           | 5.1745      | 2.90 | 4.23 |
|                            | Total              | 55 | 2.7201 | .48858         | .06588     | 2.5880                           | 2.8522      | 1.88 | 4.23 |

**Table (9): Descriptive of Statistical Differences among (Gaza) Participants According to their Hemoglobin Level**

| Factor                     | Hemoglobin Level | N  | Mean   | Std. Deviation | Std. Error | 95% Confidence Interval for Mean |             | Min  | Max  |
|----------------------------|------------------|----|--------|----------------|------------|----------------------------------|-------------|------|------|
|                            |                  |    |        |                |            | Lower Bound                      | Upper Bound |      |      |
| Total SERVQUAL Performance | Less than 7      | 3  | 2.5712 | .82491         | .47626     | .5220                            | 4.6203      | 1.88 | 3.48 |
|                            | (7.1-8.9)        | 34 | 2.6631 | .46213         | .07925     | 2.5019                           | 2.8244      | 1.94 | 4.07 |
|                            | (9.0-10.9)       | 17 | 2.7714 | .35108         | .08515     | 2.5909                           | 2.9519      | 2.12 | 3.36 |
|                            | More than 11     | 1  | 4.2327 | .              | .          | .                                | .           | 4.23 | 4.23 |
|                            | Total            | 55 | 2.7201 | .48858         | .06588     | 2.5880                           | 2.8522      | 1.88 | 4.23 |
| Total Importance           | Less than 7      | 3  | 4.5214 | .42338         | .24444     | 3.4696                           | 5.5731      | 4.20 | 5.00 |
|                            | (7.1-8.9)        | 34 | 4.2130 | .47089         | .08076     | 4.0487                           | 4.3773      | 2.54 | 5.00 |
|                            | (9.0-10.9)       | 17 | 4.3217 | .32677         | .07925     | 4.1537                           | 4.4897      | 3.89 | 5.00 |
|                            | More than 11     | 1  | 2.5595 | .              | .          | .                                | .           | 2.56 | 2.56 |
|                            | Total            | 55 | 4.2334 | .48269         | .06509     | 4.1029                           | 4.3639      | 2.54 | 5.00 |

**Table (10): Mean, Standard Deviation and Estimation Level of the service quality PERFORMANCE in West Bank hospitals along SERVQUAL**

| Performance                                                         |             |             |              |                  |                                                                   |              |             |              |                         |
|---------------------------------------------------------------------|-------------|-------------|--------------|------------------|-------------------------------------------------------------------|--------------|-------------|--------------|-------------------------|
| Availability and Accessibility                                      | Means       | S.D         | (%)          | Estimation level | Tangibility                                                       | Means        | S.D         | (%)          | Estimation level        |
| Providing separate daycare units                                    | 4.16        | 0.79        | 83.2%        | High             | Modern ,update medical supplies and equipment                     | 3.19         | 1.27        | 63.8%        | Moderate                |
| Providing filtered & safe blood units                               | 3.90        | 1.09        | 78%          | High             | Clean and comfortable environment in healthcare center            | 3.98         | 1.07        | 79.6%        | High                    |
| Providing constantly drugs and medical supplies                     | 3.55        | 1.25        | 71%          | High             | Neat and professional appearance of doctors/staff                 | 4.17         | 0.86        | 83.4%        | High                    |
| Having multidisciplinary team                                       | 3.17        | 1.32        | 63.4%        | Moderate         | Appropriate physical facilities                                   | 3.27         | 1.31        | 65.4%        | Moderate                |
| Providing periodic laboratory tests                                 | 3.68        | 1.30        | 73.6%        | High             | Confidentiality and privacy during treatment                      | 4.17         | 1.14        | 83.4%        | High                    |
| Sufficient number of doctors/ staff/ equipments / beds              | 3.37        | 1.24        | 67.4%        | Moderate         | <b>Total</b>                                                      | <b>3.76</b>  | <b>0.80</b> | <b>75.2%</b> | <b>High</b>             |
| Information system and patient database                             | 3.95        | 0.99        | 79%          | High             | <b>Responsiveness</b>                                             | <b>Means</b> | <b>S.D</b>  | <b>(%)</b>   | <b>Estimation level</b> |
| Easy access to center location and transportation cost              | 2.56        | 1.43        | 51.2%        | Low              | Doctors/staff always willing to help patients                     | 3.86         | 0.89        | 77.2%        | High                    |
| Easy appointment booking and transferring between to specialities   | 3.42        | 1.23        | 68.4%        | High             | Informing patients precisely when services will be performed      | 3.41         | 1.31        | 68.2%        | High                    |
| Availability of treatment in emergency                              | 3.65        | 1.16        | 73%          | High             | Prompt response to requests &take quick actions in emergent cases | 3.65         | 1.26        | 73%          | High                    |
| Easily providence of the necessary care when needed admission       | 4.10        | 0.98        | 82%          | High             | Easy access to doctors/staff when needed                          | 3.33         | 1.19        | 66.6%        | Moderate                |
| Adequate health insurance coverage for the costs of medication      | 4.23        | 1.00        | 84.6%        | Very high        | Reducing waiting time for delivered medical service               | 3.19         | 1.18        | 63.8%        | Moderate                |
| Sufficient working hours                                            | 3.73        | 1.29        | 74.6%        | High             | <b>Total</b>                                                      | <b>3.49</b>  | <b>0.90</b> | <b>69.8%</b> | <b>High</b>             |
| Transferring system for treating abroad &coverage costs & follow-up | 2.54        | 1.35        | 50.8%        | Low              |                                                                   |              |             |              |                         |
| <b>Total</b>                                                        | <b>3.57</b> | <b>0.68</b> | <b>71.4%</b> | <b>High</b>      |                                                                   |              |             |              |                         |

| <b>Reliability</b>                                                     | <b>Means</b> | <b>S.D</b>  | <b>(%)</b>   | <b>Estimation level</b> | <b>Assurance</b>                                                        | <b>Means</b> | <b>S.D</b>  | <b>(%)</b>   | <b>Estimation level</b> |
|------------------------------------------------------------------------|--------------|-------------|--------------|-------------------------|-------------------------------------------------------------------------|--------------|-------------|--------------|-------------------------|
| Carrying out the medical services correctly at the first time          | 3.81         | 1.17        | 76.2%        | High                    | Instilling confidence and trust in the patient through staff's behavior | 3.28         | 1.27        | 65.6%        | Moderate                |
| Providing medical services at the appointed time                       | 3.83         | 0.89        | 76.6%        | High                    | Friendly, trustworthy & courteous staff & having good communication     | 3.82         | 1.07        | 76.4%        | High                    |
| Doctors/staff are professional and competent                           | 3.50         | 1.18        | 70%          | High                    | Feeling secured and safe in receiving healthcare                        | 3.78         | 1.11        | 75.2%        | High                    |
| Continued training of doctors/ staff on the modern ways                | 3.36         | 1.20        | 67.2%        | Moderate                | Using medical equipment safely, quickly and skillfully                  | 3.76         | 0.90        | 75.2%        | High                    |
| Sincere care to solve the patients' problems                           | 2.91         | 1.42        | 58.2%        | Moderate                | Treating the patient with respect and dignity                           | 3.90         | 1.15        | 78%          | High                    |
| Keeping accurate, documented and fast retrieval records                | 3.89         | 1.09        | 77.8%        | High                    | Possessing staff a wide spectrum of knowledge to answer questions       | 3.62         | 1.25        | 72.4%        | High                    |
| Systematic follow up & supervision of the staff, not frequent rotation | 3.65         | 1.07        | 73%          | High                    | <b>Total</b>                                                            | <b>3.69</b>  | <b>0.88</b> | <b>73.8%</b> | <b>High</b>             |
| Informing patients accurately how services will be performed           | 3.63         | 1.18        | 72.6%        | High                    | <b>Empathy</b>                                                          | <b>Means</b> | <b>S.D</b>  | <b>(%)</b>   | <b>Estimation level</b> |
| Accurate diagnosis of the disease and its complications                | 3.61         | 1.25        | 72.2%        | High                    | Creating atmosphere of fun & making efforts to comfortably treatment    | 3.23         | 1.31        | 64.6%        | Moderate                |
| Giving sufficient time to examination & give instructions              | 3.44         | 1.37        | 68.8%        | High                    | Giving individual attention                                             | 3.31         | 1.21        | 66.2%        | Moderate                |
| <b>Total</b>                                                           | <b>3.56</b>  | <b>0.83</b> | <b>71.2%</b> | <b>High</b>             | Having patient' best interest at heart                                  | 3.41         | 1.29        | 68.2%        | High                    |
|                                                                        |              |             |              |                         | Paying attention to the feelings of the patient, family & easing pain   | 3.18         | 1.37        | 63.6%        | Moderate                |
|                                                                        |              |             |              |                         | Psychosocial, emotional support & non-marginalization ,negligence       | 3.00         | 1.38        | 60%          | Moderate                |
|                                                                        |              |             |              |                         | Encouraging self-care and compliance with treatment                     | 3.52         | 1.43        | 70.4%        | High                    |
|                                                                        |              |             |              |                         | Getting feedback from patients                                          | 2.88         | 1.33        | 57.6%        | Moderate                |
|                                                                        |              |             |              |                         | Understanding specific needs of patients                                | 3.15         | 1.39        | 63%          | Moderate                |
|                                                                        |              |             |              |                         | <b>Total</b>                                                            | <b>3.21</b>  | <b>1.11</b> | <b>64.2%</b> | <b>Moderate</b>         |

**Table (11): Mean levels of the West Bank hospitals' IMPORTANCE along SERVQUAL**

| <b>Importance</b>                                                     |              |                                                                         |              |
|-----------------------------------------------------------------------|--------------|-------------------------------------------------------------------------|--------------|
| <b>Availability and Accessibility</b>                                 | <b>Means</b> | <b>Tangibility</b>                                                      | <b>Means</b> |
| Providing separate daycare units                                      | 4.69         | Modern ,update medical supplies and equipment                           | 4.48         |
| Providing filtered & safe blood units                                 | 4.82         | Clean and comfortable environment in healthcare center                  | 4.51         |
| Providing constantly drugs and medical supplies                       | 4.68         | Neat and professional appearance of doctors/staff                       | 3.88         |
| Having multidisciplinary team                                         | 4.57         | Appropriate physical facilities                                         | 4.21         |
| Providing periodic laboratory tests                                   | 4.81         | Confidentiality and privacy during treatment                            | 4.62         |
| Sufficient number of doctors/ staff/ equipments / beds                | 4.56         | <b>Total</b>                                                            | <b>4.34</b>  |
| Information system and patient database                               | 4.17         | <b>Responsiveness</b>                                                   | <b>Means</b> |
| Easy access to center location and transportation cost                | 4.05         | Doctors/staff always willing to help patients                           | 4.51         |
| Easy appointment booking and transferring between to specialties      | 4.48         | Informing patients precisely when services will be performed            | 4.50         |
| Availability of treatment in emergency                                | 4.53         | Prompt response to requests &take quick actions in emergent cases       | 4.63         |
| Easily providence of the necessary care when needed admission         | 4.47         | Easy access to doctors/staff when needed                                | 4.54         |
| Adequate health insurance coverage for the costs of medication        | 4.66         | Reducing waiting time for delivered medical service                     | 4.61         |
| Sufficient working hours                                              | 4.43         | <b>Total</b>                                                            | <b>4.56</b>  |
| Transferring system for treating abroad &coverage costs & follow-up   | 4.43         | <b>Assurance</b>                                                        | <b>Means</b> |
| <b>Total</b>                                                          | <b>4.57</b>  | Instilling confidence and trust in the patient through staff's behavior | 4.43         |
| <b>Reliability</b>                                                    | <b>Means</b> | Friendly, trustworthy & courteous staff & having good communication     | 4.49         |
| Carrying out the medical services correctly at the first time         | 4.56         | Feeling secured and safe in receiving healthcare                        | 4.47         |
| Providing medical services at the appointed time                      | 4.60         | Using medical equipment safely ,quickly and skillfully                  | 4.51         |
| Doctors/staff are professional and competent                          | 4.53         | Treating the patient with respect and dignity                           | 4.63         |
| Continued training of doctors/ staff on the modern ways               | 4.38         | Possessing staff a wide spectrum of knowledge to answer questions       | 4.54         |
| Sincere care to solve the patients' problems                          | 4.31         | <b>Total</b>                                                            | <b>4.51</b>  |
| Keeping accurate, documented and fast retrieval records               | 4.30         | <b>Empathy</b>                                                          | <b>Means</b> |
| Systematic follow up &supervision of the staff, not frequent rotation | 4.32         | Creating atmosphere of fun &making efforts to comfortably treatment     | 4.38         |
| Informing patients accurately how services will be performed          | 4.40         | Giving individual attention                                             | 4.27         |
| Accurate diagnosis of the disease and its complications               | 4.57         | Having patient' best interest at heart                                  | 4.40         |
| Giving sufficient time to examination                                 | 4.64         | Paying attention to the feelings of the                                 | 4.49         |

|                     |             |                                                                      |             |
|---------------------|-------------|----------------------------------------------------------------------|-------------|
| & give instructions |             | patient, family & easing pain                                        |             |
| <b>Total</b>        | <b>4.46</b> | Psychosocial, emotional support<br>& non-marginalization, negligence | 4.46        |
|                     |             | Encouraging self-care and<br>compliance with treatment               | 4.56        |
|                     |             | Getting feedback from patients                                       | 4.19        |
|                     |             | Understanding specific needs of<br>patients                          | 4.23        |
|                     |             | <b>Total</b>                                                         | <b>4.37</b> |

**Table (12): Mean, Standard Deviation and Estimation Level of the service quality PERFORMANCE in Gaza hospital along SERVQUAL**

| Performance                                                         |             |             |              |                  |                                                                   |              |             |              |                         |
|---------------------------------------------------------------------|-------------|-------------|--------------|------------------|-------------------------------------------------------------------|--------------|-------------|--------------|-------------------------|
| Availability and Accessibility                                      | Means       | S.D         | (%)          | Estimation level | Tangibility                                                       | Means        | S.D         | (%)          | Estimation level        |
| Providing separate daycare units                                    | 2.49        | 0.94        | 49.8%        | Low              | Modern ,update medical supplies and equipment                     | 2.47         | 0.94        | 49.4%        | Low                     |
| Providing filtered & safe blood units                               | 2.53        | 0.96        | 50.6%        | Low              | Clean and comfortable environment in healthcare center            | 2.82         | 0.88        | 56.4%        | Moderate                |
| Providing constantly drugs and medical supplies                     | 2.11        | 1.05        | 42.2%        | Low              | Neat and professional appearance of doctors/staff                 | 2.93         | 0.89        | 58.6%        | Moderate                |
| Having multidisciplinary team                                       | 2.36        | 0.97        | 47.2%        | Low              | Appropriate physical facilities                                   | 2.73         | 0.82        | 54.6%        | Moderate                |
| Providing periodic laboratory tests                                 | 2.09        | 1.04        | 41.8%        | Low              | Confidentiality and privacy during treatment                      | 2.89         | 0.71        | 57.8%        | Moderate                |
| Sufficient number of doctors/ staff/ equipments / beds              | 2.54        | 0.83        | 50.8%        | Low              | <b>Total</b>                                                      | <b>2.77</b>  | <b>0.66</b> | <b>55.4%</b> | <b>Moderate</b>         |
| Information system and patient database                             | 2.84        | 0.71        | 56.8%        | Moderate         | <b>Responsiveness</b>                                             | <b>Means</b> | <b>S.D</b>  | <b>(%)</b>   | <b>Estimation level</b> |
| Easy access to center location and transportation cost              | 2.49        | 0.76        | 49.8%        | Low              | Doctors/staff always willing to help patients                     | 2.94         | 0.70        | 58.8%        | Moderate                |
| Easy appointment booking and transferring between to specialties    | 2.45        | 0.96        | 49%          | Low              | Informing patients precisely when services will be performed      | 2.96         | 0.72        | 59.2%        | Moderate                |
| Availability of treatment in emergency                              | 2.69        | 0.94        | 53.8%        | Moderate         | Prompt response to requests &take quick actions in emergent cases | 2.78         | 0.66        | 55.6%        | Moderate                |
| Easily providence of the necessary care when needed admission       | 2.58        | 0.83        | 51.6%        | Low              | Easy access to doctors/staff when needed                          | 2.85         | 0.56        | 57%          | Moderate                |
| Adequate health insurance coverage for the costs of medication      | 2.62        | 0.91        | 52.4%        | Moderate         | Reducing waiting time for delivered medical service               | 2.85         | 0.65        | 57%          | Moderate                |
| Sufficient working hours                                            | 2.54        | 0.89        | 50.8%        | Low              | <b>Total</b>                                                      | <b>2.88</b>  | <b>0.53</b> | <b>57.6%</b> | <b>Moderate</b>         |
| Transferring system for treating abroad &coverage costs & follow-up | 1.69        | 0.92        | 33.8%        | Very low         |                                                                   |              |             |              |                         |
| <b>Total</b>                                                        | <b>2.43</b> | <b>0.63</b> | <b>48.6%</b> | <b>Low</b>       |                                                                   |              |             |              |                         |



| Reliability                                                           | Means       | S.D         | (%)          | Estimation level | Assurance                                                               | Means        | S.D         | (%)          | Estimation level        |
|-----------------------------------------------------------------------|-------------|-------------|--------------|------------------|-------------------------------------------------------------------------|--------------|-------------|--------------|-------------------------|
| Carrying out the medical services correctly at the first time         | 2.83        | 0.81        | 56.6%        | Moderate         | Instilling confidence and trust in the patient through staff's behavior | 2.94         | 0.75        | 58.8%        | Moderate                |
| Providing medical services at the appointed time                      | 2.80        | 0.70        | 56%          | Moderate         | Friendly, trustworthy & courteous staff & having good communication     | 2.92         | 0.74        | 58.4%        | Moderate                |
| Doctors/staff are professional and competent                          | 2.89        | 0.73        | 57.8%        | Moderate         | Feeling secured and safe in receiving healthcare                        | 2.89         | 0.76        | 57.8%        | Moderate                |
| Continued training of doctors/ staff on the modern ways               | 2.71        | 0.76        | 54.2%        | Moderate         | Using medical equipment safely ,quickly and skillfully                  | 2.87         | 0.72        | 57.4%        | Moderate                |
| Sincere care to solve the patients' problems                          | 2.38        | 0.87        | 47.6%        | Low              | Treating the patient with respect and dignity                           | 2.94         | 0.70        | 58.8%        | Moderate                |
| Keeping accurate, documented and fast retrieval records               | 2.82        | 0.72        | 56.4%        | Moderate         | Possessing staff a wide spectrum of knowledge to answer questions       | 2.93         | 0.76        | 58.6%        | Moderate                |
| Systematic follow up &supervision of the staff, not frequent rotation | 2.65        | 0.64        | 53%          | Moderate         | <b>Total</b>                                                            | <b>2.92</b>  | <b>0.58</b> | <b>58.4%</b> | <b>Moderate</b>         |
| Informing patients accurately how services will be performed          | 2.58        | 0.74        | 51.6%        | Low              | <b>Empathy</b>                                                          | <b>Means</b> | <b>S.D</b>  | <b>(%)</b>   | <b>Estimation level</b> |
| Accurate diagnosis of the disease and its complications               | 2.54        | 0.71        | 50.8%        | Low              | Creating atmosphere of fun &making efforts to comfortably treatment     | 2.76         | 0.92        | 55.2%        | Moderate                |
| Giving sufficient time to examination & give instructions             | 2.64        | 0.73        | 52.8%        | Moderate         | Giving individual attention                                             | 2.78         | 0.85        | 55.6%        | Moderate                |
| <b>Total</b>                                                          | <b>2.68</b> | <b>0.50</b> | <b>53.6%</b> | <b>Moderate</b>  | Having patient' best interest at heart                                  | 2.63         | 0.91        | 52.6%        | Moderate                |
|                                                                       |             |             |              |                  | Paying attention to the feelings of the patient, family &easing pain    | 2.64         | 0.93        | 52.8%        | Moderate                |
|                                                                       |             |             |              |                  | Psychosocial, emotional support &non-marginalization ,negligence        | 2.53         | 0.98        | 50.6%        | Low                     |
|                                                                       |             |             |              |                  | Encouraging self-care and compliance with treatment                     | 2.58         | 0.97        | 51.6%        | Low                     |
|                                                                       |             |             |              |                  | Getting feedback from patients                                          | 2.63         | 0.95        | 52.6%        | Moderate                |
|                                                                       |             |             |              |                  | Understanding specific needs of patients                                | 2.54         | 0.96        | 50.8%        | Low                     |
|                                                                       |             |             |              |                  | <b>Total</b>                                                            | <b>2.64</b>  | <b>0.78</b> | <b>52.8%</b> | <b>Moderate</b>         |

**Table (13): Mean levels of the Gaza hospital's IMPORTANCE along SERVQUAL**

| <b>Importance</b>                                                      |              |                                                                         |              |
|------------------------------------------------------------------------|--------------|-------------------------------------------------------------------------|--------------|
| <b>Availability and Accessibility</b>                                  | <b>Means</b> | <b>Tangibility</b>                                                      | <b>Means</b> |
| Providing separate daycare units                                       | 4.76         | Modern ,update medical supplies and equipment                           | 4.65         |
| Providing filtered & safe blood units                                  | 4.71         | Clean and comfortable environment in healthcare center                  | 4.49         |
| Providing constantly drugs and medical supplies                        | 4.78         | Neat and professional appearance of doctors/staff                       | 4.43         |
| Having multidisciplinary team                                          | 4.56         | Appropriate physical facilities                                         | 4.31         |
| Providing periodic laboratory tests                                    | 4.69         | Confidentiality and privacy during treatment                            | 4.25         |
| Sufficient number of doctors/ staff/ equipments / beds                 | 4.51         | <b>Total</b>                                                            | <b>4.43</b>  |
| Information system and patient database                                | 4.43         | <b>Responsiveness</b>                                                   | <b>Means</b> |
| Easy access to center location and transportation cost                 | 4.40         | Doctors/staff always willing to help patients                           | 4.14         |
| Easy appointment booking and transferring between to specialties       | 4.47         | Informing patients precisely when services will be performed            | 4.11         |
| Availability of treatment in emergency                                 | 4.51         | Prompt response to requests & take quick actions in emergent cases      | 4.29         |
| Easily providence of the necessary care when needed admission          | 4.45         | Easy access to doctors/staff when needed                                | 4.05         |
| Adequate health insurance coverage for the costs of medication         | 4.51         | Reducing waiting time for delivered medical service                     | 4.02         |
| Sufficient working hours                                               | 4.40         | <b>Total</b>                                                            | <b>4.12</b>  |
| Transferring system for treating abroad & coverage costs & follow-up   | 4.76         | <b>Assurance</b>                                                        | <b>Means</b> |
| <b>Total</b>                                                           | <b>4.63</b>  | Instilling confidence and trust in the patient through staff's behavior | 4.07         |
| <b>Reliability</b>                                                     | <b>Means</b> | Friendly, trustworthy & courteous staff & having good communication     | 4.04         |
| Carrying out the medical services correctly at the first time          | 4.20         | Feeling secured and safe in receiving healthcare                        | 4.04         |
| Providing medical services at the appointed time                       | 4.16         | Using medical equipment safely ,quickly and skillfully                  | 3.96         |
| Doctors/staff are professional and competent                           | 4.11         | Treating the patient with respect and dignity                           | 4.02         |
| Continued training of doctors/ staff on the modern ways                | 4.16         | Possessing staff a wide spectrum of knowledge to answer questions       | 3.98         |
| Sincere care to solve the patients' problems                           | 4.27         | <b>Total</b>                                                            | <b>4.02</b>  |
| Keeping accurate, documented and fast retrieval records                | 4.22         | <b>Empathy</b>                                                          | <b>Means</b> |
| Systematic follow up & supervision of the staff, not frequent rotation | 4.14         | Creating atmosphere of fun & making efforts to comfortably treatment    | 4.02         |
| Informing patients accurately how services will be performed           | 4.07         | Giving individual attention                                             | 4.03         |
| Accurate diagnosis of the disease and its complications                | 4.16         | Having patient' best interest at heart                                  | 4.07         |
| Giving sufficient time to examination & give instructions              | 4.11         | Paying attention to the feelings of the patient, family & easing pain   | 4.02         |

|              |             |                                                                   |             |
|--------------|-------------|-------------------------------------------------------------------|-------------|
| <b>Total</b> | <b>4.16</b> | Psychosocial, emotional support & non-marginalization, negligence | 4.09        |
|              |             | Encouraging self-care and compliance with treatment               | 4.05        |
|              |             | Getting feedback from patients                                    | 4.03        |
|              |             | Understanding specific needs of patients                          | 3.96        |
|              |             | <b>Total</b>                                                      | <b>4.03</b> |

**Table (14): Mean, Standard Deviation and Estimation Level of the service quality PERFORMANCE in Dubai hospital along SERVQUAL**

| Performance                                                         |             |             |              |                  |                                                                   |              |             |              |                         |
|---------------------------------------------------------------------|-------------|-------------|--------------|------------------|-------------------------------------------------------------------|--------------|-------------|--------------|-------------------------|
| Availability and Accessibility                                      | Means       | S.D         | (%)          | Estimation level | Tangibility                                                       | Means        | S.D         | (%)          | Estimation level        |
| Providing separate daycare units                                    | 4.80        | 0.67        | 96%          | Very High        | Modern ,update medical supplies and equipment                     | 4.66         | 0.55        | 93.2%        | Very High               |
| Providing filtered & safe blood units                               | 4.69        | 0.74        | 93.8%        | Very High        | Clean and comfortable environment in healthcare center            | 4.79         | 0.56        | 95.8%        | Very High               |
| Providing constantly drugs and medical supplies                     | 4.81        | 0.56        | 96.2%        | Very High        | Neat and professional appearance of doctors/staff                 | 4.80         | 0.57        | 96%          | Very High               |
| Having multidisciplinary team                                       | 4.73        | 0.60        | 94.6%        | Very High        | Appropriate physical facilities                                   | 4.44         | 0.88        | 88.8%        | Very High               |
| Providing periodic laboratory tests                                 | 4.71        | 0.59        | 94.2%        | Very High        | Confidentiality and privacy during treatment                      | 4.34         | 1.13        | 86.8%        | Very High               |
| Sufficient number of doctors/ staff/ equipments / beds              | 4.54        | 0.79        | 90.8%        | Very High        | <b>Total</b>                                                      | <b>4.61</b>  | <b>0.56</b> | <b>92.2%</b> | <b>Very High</b>        |
| Information system and patient database                             | 4.60        | 0.71        | 92%          | Very High        | <b>Responsiveness</b>                                             | <b>Means</b> | <b>S.D</b>  | <b>(%)</b>   | <b>Estimation level</b> |
| Easy access to center location and transportation cost              | 4.57        | 0.76        | 91.4%        | Very High        | Doctors/staff always willing to help patients                     | 4.68         | 0.63        | 93.6%        | Very High               |
| Easy appointment booking and transferring between to specialties    | 4.42        | 0.86        | 88.4%        | Very High        | Informing patients precisely when services will be performed      | 4.57         | 0.79        | 91.4%        | Very High               |
| Availability of treatment in emergency                              | 4.33        | 1.01        | 86.6%        | Very High        | Prompt response to requests &take quick actions in emergent cases | 4.54         | 0.79        | 90.8%        | Very High               |
| Easily providence of the necessary care when needed admission       | 4.47        | .845        | 89.4%        | Very High        | Easy access to doctors/staff when needed                          | 4.60         | 0.77        | 92%          | Very High               |
| Adequate health insurance coverage for the costs of medication      | 4.79        | 0.83        | 95.8%        | Very High        | Reducing waiting time for delivered medical service               | 4.39         | 0.87        | 87.8%        | Very High               |
| Sufficient working hours                                            | 4.58        | 0.70        | 91.6%        | Very High        | <b>Total</b>                                                      | <b>4.56</b>  | <b>0.64</b> | <b>91.2%</b> | <b>Very High</b>        |
| Transferring system for treating abroad &coverage costs & follow-up | 4.54        | 0.76        | 90.8%        | Very High        |                                                                   |              |             |              |                         |
| <b>Total</b>                                                        | <b>4.61</b> | <b>0.55</b> | <b>92.2%</b> | <b>Very High</b> |                                                                   |              |             |              |                         |

| Reliability                                                           | Means       | S.D         | (%)          | Estimation level | Assurance                                                               | Means        | S.D         | (%)          | Estimation level        |
|-----------------------------------------------------------------------|-------------|-------------|--------------|------------------|-------------------------------------------------------------------------|--------------|-------------|--------------|-------------------------|
| Carrying out the medical services correctly at the first time         | 4.68        | 0.65        | 93.6%        | Very High        | Instilling confidence and trust in the patient through staff's behavior | 4.63         | 0.72        | 92.6%        | Very High               |
| Providing medical services at the appointed time                      | 4.57        | 0.77        | 91.4%        | Very High        | Friendly, trustworthy & courteous staff & having good communication     | 4.79         | 0.56        | 95.8%        | Very High               |
| Doctors/staff are professional and competent                          | 4.60        | 0.74        | 92%          | Very High        | Feeling secured and safe in receiving healthcare                        | 4.67         | 0.65        | 93.4%        | Very High               |
| Continued training of doctors/ staff on the modern ways               | 4.46        | 0.78        | 89.2%        | Very High        | Using medical equipment safely ,quickly and skillfully                  | 4.69         | 0.65        | 93.8%        | Very High               |
| Sincere care to solve the patients' problems                          | 4.53        | 0.83        | 90.6%        | Very High        | Treating the patient with respect and dignity                           | 4.70         | 0.61        | 94%          | Very High               |
| Keeping accurate, documented and fast retrieval records               | 4.58        | 0.72        | 91.6%        | Very High        | Possessing staff a wide spectrum of knowledge to answer questions       | 4.67         | 0.68        | 93.4%        | Very High               |
| Systematic follow up &supervision of the staff, not frequent rotation | 4.54        | 0.81        | 90.8%        | Very High        | <b>Total</b>                                                            | <b>4.69</b>  | <b>0.58</b> | <b>93.8%</b> | <b>Very High</b>        |
| Informing patients accurately how services will be performed          | 4.57        | 0.75        | 91.4%        | Very High        | <b>Empathy</b>                                                          | <b>Means</b> | <b>S.D</b>  | <b>(%)</b>   | <b>Estimation level</b> |
| Accurate diagnosis of the disease and its complications               | 4.53        | 0.73        | 90.6%        | Very High        | Creating atmosphere of fun &making efforts to comfortably treatment     | 4.54         | 0.79        | 90.8%        | Very High               |
| Giving sufficient time to examination & give instructions             | 4.60        | 0.78        | 92%          | Very High        | Giving individual attention                                             | 4.62         | 0.68        | 92.4%        | Very High               |
| <b>Total</b>                                                          | <b>4.57</b> | <b>0.61</b> | <b>91.4%</b> | <b>Very High</b> | Having patient' best interest at heart                                  | 4.61         | 0.67        | 92.2%        | Very High               |
|                                                                       |             |             |              |                  | Paying attention to the feelings of the patient, family &easing pain    | 4.62         | 0.65        | 92.4%        | Very High               |
|                                                                       |             |             |              |                  | Psychosocial, emotional support &non-marginalization ,negligence        | 4.58         | 0.72        | 91.6%        | Very High               |
|                                                                       |             |             |              |                  | Encouraging self-care and compliance with treatment                     | 4.66         | 0.72        | 93.2%        | Very High               |
|                                                                       |             |             |              |                  | Getting feedback from patients                                          | 4.64         | .66         | 92.8%        | Very High               |
|                                                                       |             |             |              |                  | Understanding specific needs of patients                                | 4.57         | 0.79        | 91.4%        | Very High               |
|                                                                       |             |             |              |                  | <b>Total</b>                                                            | <b>4.60</b>  | <b>0.59</b> | <b>92%</b>   | <b>Very High</b>        |

**Table (15): Mean levels of the Dubai hospital's IMPORTANCE along SERVQUAL**

| <b>Importance</b>                                                     |              |                                                                         |              |
|-----------------------------------------------------------------------|--------------|-------------------------------------------------------------------------|--------------|
| <b>Availability and Accessibility</b>                                 | <b>Means</b> | <b>Tangibility</b>                                                      | <b>Means</b> |
| Providing separate daycare units                                      | 4.46         | Modern ,update medical supplies and equipment                           | 4.42         |
| Providing filtered & safe blood units                                 | 4.84         | Clean and comfortable environment in healthcare center                  | 4.47         |
| Providing constantly drugs and medical supplies                       | 4.83         | Neat and professional appearance of doctors/staff                       | 3.94         |
| Having multidisciplinary team                                         | 4.67         | Appropriate physical facilities                                         | 4.14         |
| Providing periodic laboratory tests                                   | 4.73         | Confidentiality and privacy during treatment                            | 4.60         |
| Sufficient number of doctors/ staff/ equipments / beds                | 4.55         | <b>Total</b>                                                            | <b>4.31</b>  |
| Information system and patient database                               | 4.26         | <b>Responsiveness</b>                                                   | <b>Means</b> |
| Easy access to center location and transportation cost                | 4.15         | Doctors/staff always willing to help patients                           | 4.64         |
| Easy appointment booking and transferring between to specialties      | 4.43         | Informing patients precisely when services will be performed            | 4.54         |
| Availability of treatment in emergency                                | 4.56         | Prompt response to requests &take quick actions in emergent cases       | 4.67         |
| Easily providence of the necessary care when needed admission         | 4.46         | Easy access to doctors/staff when needed                                | 4.59         |
| Adequate health insurance coverage for the costs of medication        | 4.34         | Reducing waiting time for delivered medical service                     | 4.54         |
| Sufficient working hours                                              | 4.56         | <b>Total</b>                                                            | <b>4.60</b>  |
| Transferring system for treating abroad &coverage costs & follow-up   | 4.30         | <b>Assurance</b>                                                        | <b>Means</b> |
| <b>Total</b>                                                          | <b>4.51</b>  | Instilling confidence and trust in the patient through staff's behavior | 4.58         |
| <b>Reliability</b>                                                    | <b>Means</b> | Friendly, trustworthy & courteous staff & having good communication     | 4.55         |
| Carrying out the medical services correctly at the first time         | 4.66         | Feeling secured and safe in receiving healthcare                        | 4.54         |
| Providing medical services at the appointed time                      | 4.50         | Using medical equipment safely ,quickly and skillfully                  | 4.60         |
| Doctors/staff are professional and competent                          | 4.50         | Treating the patient with respect and dignity                           | 4.80         |
| Continued training of doctors/ staff on the modern ways               | 4.19         | Possessing staff a wide spectrum of knowledge to answer questions       | 4.61         |
| Sincere care to solve the patients' problems                          | 4.28         | <b>Total</b>                                                            | <b>4.61</b>  |
| Keeping accurate, documented and fast retrieval records               | 4.34         | <b>Empathy</b>                                                          | <b>Means</b> |
| Systematic follow up &supervision of the staff, not frequent rotation | 4.45         | Creating atmosphere of fun &making efforts to comfortably treatment     | 4.41         |
| Informing patients accurately how services will be performed          | 4.57         | Giving individual attention                                             | 4.45         |
| Accurate diagnosis of the disease and its complications               | 4.66         | Having patient' best interest at heart                                  | 4.38         |
| Giving sufficient time to examination & give instructions             | 4.62         | Paying attention to the feelings of the patient, family &easing pain    | 4.64         |

|              |             |                                                                   |             |
|--------------|-------------|-------------------------------------------------------------------|-------------|
| <b>Total</b> | <b>4.48</b> | Psychosocial, emotional support & non-marginalization ,negligence | 4.71        |
|              |             | Encouraging self-care and compliance with treatment               | 4.65        |
|              |             | Getting feedback from patients                                    | 4.32        |
|              |             | Understanding specific needs of patients                          | 4.40        |
|              |             | <b>Total</b>                                                      | <b>4.50</b> |

## Appendix (C)

Table (16): After-Study Interviews Analysis

| Category            | Subcategory                                                   | The viewpoint of specialists at hospitals |           |                                                |                                                           |                |                                                             |           |
|---------------------|---------------------------------------------------------------|-------------------------------------------|-----------|------------------------------------------------|-----------------------------------------------------------|----------------|-------------------------------------------------------------|-----------|
|                     |                                                               | Nablus                                    | Tulkarem  | Jenin                                          | Ramallah                                                  | Hebron         | Gaza                                                        | Dubai     |
| STAFFING            | Doctors/ staff qualification & experience level               | High                                      | Medium    | Medium                                         | Low                                                       | High           | High, there are 5 hematologists with 10-15 years experience | Very high |
|                     | Staff training, education and development programs            | Medium                                    | Medium    | Medium                                         | Very low                                                  | High           | Very low                                                    | Very high |
|                     | Having Multi-disciplinary doctors in the hospital             | Medium                                    | Medium    | Low, there is no psychologist or social worker | Low                                                       | Low            | Medium, but psychologist or social worker not available     | Very high |
|                     | Hiring Enough full-time doctors/staff                         | High                                      | High      | Medium                                         | Very low, no full-time doctor and there is just one nurse | Medium         | high                                                        | High      |
|                     | Mechanisms to ensure staff accountability                     | High                                      | Very high | High                                           | Medium                                                    | Medium         | Low                                                         | High      |
|                     | Staff motivation skill level                                  | Very low                                  | Very low  | Low                                            | Very low                                                  | Low            | Very low                                                    | Medium    |
|                     | Staff empowerment and involvement in decision making          | Low                                       | Very low  | Very Low                                       | Very low                                                  | Low            | Medium                                                      | High      |
|                     | Behavior and attitude of staff                                | High                                      | Very high | High                                           | High                                                      | Medium         | High                                                        | High      |
|                     | Teamwork, knowledge and communication excellence skills level | High                                      | Low       | Medium                                         | Medium                                                    | Medium         | High                                                        | High      |
|                     | Space size of facility                                        | Medium, Sometimes                         | High      | Very high, it is a big &                       | Very high, it is a big                                    | Very low, they | Very low, they sharing the same                             | High      |
| PHYSICAL FACILITIES |                                                               |                                           |           |                                                |                                                           |                |                                                             |           |

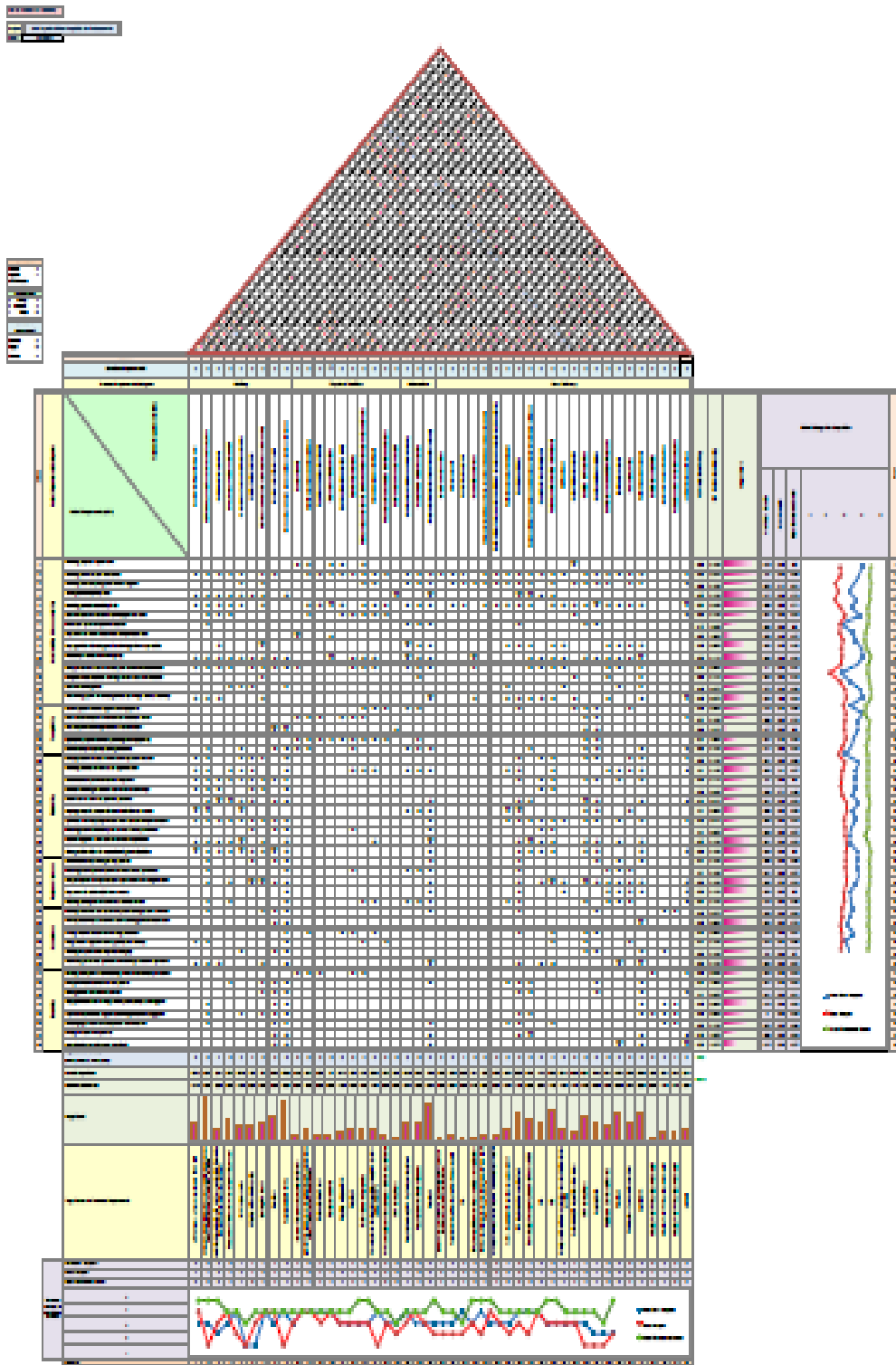


|               |                                                                                                  |                                                          |           |                |                      |                                                                     |                                                  |           |
|---------------|--------------------------------------------------------------------------------------------------|----------------------------------------------------------|-----------|----------------|----------------------|---------------------------------------------------------------------|--------------------------------------------------|-----------|
|               |                                                                                                  | can't accommodate patients because the large No. of them |           | convenient     | &convenient          | sharing the same room with hemophilia patients and are crowding out | room with oncology patients and are crowding out |           |
|               | Facility layout and ambient conditions                                                           | High                                                     | Low       | High           | Very high            | Medium                                                              | Medium                                           | High      |
|               | Hygiene and cleanness of facility                                                                | High                                                     | Very high | High           | Very high            | Medium                                                              | High                                             | High      |
|               | Closeness of facility location                                                                   | High                                                     | Very high | High           | Very high            | High                                                                | High                                             | High      |
|               | Building structure safety                                                                        | High                                                     | Low       | High           | Very high            | Medium                                                              | Medium                                           | High      |
|               | Excellent housekeeping                                                                           | Medium                                                   | Very high | High           | High                 | Medium                                                              | High                                             | High      |
|               | Having enough equipments & treatment supplies at point of care                                   | Medium                                                   | Medium    | High           | High                 | Medium                                                              | Medium                                           | High      |
|               | Technical equipments strength and its accuracy rate                                              | Medium                                                   | Low       | Medium         | Medium               | Medium                                                              | Medium                                           | High      |
|               | Frequency of equipments & facilities maintenance                                                 | Medium                                                   | Medium    | Low            | Medium               | Low                                                                 | Medium                                           | Very high |
|               | Uniforms and dress code for staff                                                                | Medium                                                   | Very high | Medium         | Low                  | Medium                                                              | Medium                                           | Very high |
| INFORMATION   | Quality documentation and accurate record-keeping                                                | High                                                     | Very high | High           | Very high            | High                                                                | Low                                              | High      |
|               | Frequent patient contact and information exchange                                                | High                                                     | Low       | Low            | Medium               | Medium                                                              | Medium                                           | High      |
|               | Computerized information system and its use effectiveness rate                                   | Medium                                                   | Very low  | Low            | Very high            | High                                                                | Low                                              | Medium    |
| CARE DELIVERY | Voluntary blood donation                                                                         | High                                                     | High      | High           | low                  | High                                                                | Medium                                           | High      |
|               | Storage capacity according number of stored units, reliability/safety conditions and expiry date | High                                                     | High      | Medium         | Medium               | Medium                                                              | High                                             | High      |
|               | Reliability of suppliers                                                                         | High                                                     | High      | Medium         | Very low             | Medium                                                              | Medium                                           | High      |
|               | Medication adherence according pharmacy fill rate                                                | Medium                                                   | High      | Low, sometimes | Very low, there is a | Medium                                                              | Low, suffering from lacking of                   | Very high |





**Appendix (D)**



جامعة النجاح الوطنية  
كلية الدراسات العليا

# تطوير جودة توفير الخدمات الطبية لمرضى الثلاسيميا في فلسطين

إعداد  
عائشه سهيل عطوه

إشراف  
د. محمد عثمان

قدمت هذه الأطروحة إستكمالاً لمتطلبات الحصول على درجة الماجستير في الإدارة  
الهندسية بكلية الدراسات العليا في جامعة النجاح الوطنية في نابلس، فلسطين

2016م

ب

## تطوير جودة توفير الخدمات الطبية لمرضى التلاسيميا في فلسطين

إعداد

عائشه سهيل عطوه

إشراف

د. محمد عثمان

### الملخص

يعتبر قطاع الرعاية الصحية بمثابة واحد من اسرع قطاعات الخدمات نموا خلال السنوات الاخيرة. وهذا النمو السريع في القطاع الصحي كان مصحوبا بتغيرات دراماتيكيه كثيره؛ هذه التغيرات ولدت المزيد من الضغوطات على مراكز الرعاية الصحية لتحسين خدماتها؛ خاصة تلك التي تتعلق بامراض الدم الوراثيه مثل التلاسيميا. يعتبر هذا المرض في فلسطين مشكلة مزمنه ومستعصيه. وبالرغم من محاولات مراكز الرعاية الصحية الفلسطينيه في مكافحة هذا المرض وتحسين وتطوير الخدمات المقدمه لمرضى التلاسيميا؛ الا ان المرضى ما زالو يعانون ويواجهون مشاكل كثيره، والعديد من الشكاوي حول جودة خدمات الرعاية الصحية لا تزال موجوده. يهدف هذا البحث الى تطوير جودة الخدمات الطبيه المقدمه لمرضى التلاسيميا في فلسطين من خلال تطبيق اداة نشر وظيفه الجوده (QFD). ولإجراء هذا البحث تم استخدام البحث الاستكشافي باتباع منهجيات البحث الكمي والنوعي على حد سواء واستخدام نسخه معدلته من مقياس جودة الخدمه المعروف ب (SERVQUAL) على 291 مريض تلاسيميا في فلسطين. وقد وجد ان "التوافر وسهولة الوصول"، "الاستجابته"، "الامان والثقه" هي ابعاد الجوده الاكثر الاهميه بالنسبة لمرضى الضفئه الغربيه وغزه. ومن خلال القياس التنافسي ومقارنة افضل الممارسات بين ثلاث منافسين تم اختيارهم مابين: مستشفيات الضفئه الغربيه، مستشفى في غزه ومركز التلاسيميا في دبي، اظهرت نتائج التحليل الوصفي ان جودة خدمات الرعاية الصحية في المستشفيات الفلسطينيه عموما أقل من توقعات المرضى. وقد وجد أن مركز دبي حقق أعلى معدل للرضا، بينما يحتاج مستشفى غزه الى تعزيز وتحسين جميع احتياجات المرضى حيث وجد ان جميع تقييمات المرضى اقل من المتوسط العام ومتخلفه عن بقية المنافسين خاصه في مجال "التوفر وسهولة الوصول". من ناحية اخرى، كان أداء

مستشفيات الضفه أفضل في مجال "الامان والثقه" و "الجوانب الماديه الملموسه" ولكنها اضعف في مجال "الاستجابه" و "التعاطف". علاوة على ذلك، فقد وجد أن " التوظيف"، و"تقديم الخدمات" هي فئات الأنشطة التقنيه الأكثر أهمية التي يجب تحسينها لتلبية أولويات المرضى.

واعتمادا على نتائج البحث، تتوصل هذه الدراسه الى بناء ست مصفوفات من بيت الجوده (HOQ) الذي يهدف إلى أن يكون بمثابة أداة للتخطيط الإداري تدعم تنفيذ ناجح لإدارة الجودة الشاملة في نظام الرعاية الصحية في فلسطين. واخيرا لتحقيق تحسينات ملموسه؛ توصي هذه الدراسه بتطوير سياسات واستراتيجيات تتعلق بمرض التلاسيميا وتبني منهج المركزيه في تقديم الرعاية الصحيه لمرضى التلاسيميا وتدريب الطواقم الطبيه على اتباع البروتوكولات العلاجيه السليمه لمرض التلاسيميا.