The Islamic University of Gaza
Deanship of Research and graduate Studies
Faculty of Commerce
Master of Business Administration

الجامعـــة الإســـلاميـــة بغـــزة
عمادة البحث العلمي والدراسات العليا
كليـــــــــة التـجـــــــارة
ماجـستـــيـــر إدارة الأعـــمـــال

The Impact of Lean Six Sigma Practices on Physiotherapy Service Quality at UNRWA Health Centers -Gaza Strip

أثر ممارسات لين ستة سيجما على جودة خدمة العلاج الطبيعي في مراكز الرعاية الصحية بالأونروا–قطاع غزة

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A Thesis Submitted in Partial Fulfillment of the Requirements for the Degree ofMaster in Business Administration.

November/ 2017

إقـــــرار

أنا الموقع أدناه مقدم الرسالة التي تحمل العنوان:

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بناءً على موافقة عمادة البحث العلمي والدراسات العليا بالجامعة الإسلامية بغزة على تشكيل لجنة الحكم على أطروحة الباحثة/ **نبيله محمد عبدالله ابوشرخ** لنيل درجة الماجستير في **كلية *التجارة*/ قسم إدارة الأعمال** وموضوعها:

أثر ممارسات لين ستة سيجما على جودة خدمة العلاج الطبيعي في مراكز الرعاية الصحية بالأونروا- قطاع غزة

The Impact of Lean Six Sigma Practices on Physiotherapy Service Quality at UNRWA Health Centers -Gaza Strip

وبعد المناقشة التي تمت اليوم الأحد 08 ربيع الأول 1439 هـ، الموافق 2017/11/26م الساعة الواحدة ظهراً، في قاعة مبنى اللحيدان اجتمعت لجنة الحكم على الأطروحة والمكونة من:

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وبعد المداولة أوصت اللجنة بمنح الباحثة درجة الماجستير في **كلية *التجارة*/ قسم إدارة الأعمال.**

واللجنة إذ تمنحها هذه الدرجة فإنها توصيها بتقوى الله ولزوم طاعته وأن يسخر علمها في خدمة دينها ووطنها.

والله ولي التوفيق،،،

عميد البحث العلمي والدراسات العليا

أ.د. مازن اسماعيل هنية

Abstract

The ultimate aim of this study is to explain the impact of lean Six sigma practices on physiotherapy service quality at UNRWA health centers - Gaza Strip. Using the descriptive analytical approach, the study targeted two different populations: all of the 49 physiotherapists working at UNRWA Health Centers as comprehensive survey method and 2165 undergoing physiotherapy treatment patients as stratified random sample.

Data was collected through two questionnaires. The first was distributed to 49 physiotherapists, a total of (43) questionnaires were received with response rate of (86.7%) of the target population. The second questionnaire was distributed to a sample of total (327) patients attending physiotherapy units, a total of 285 questionnaires were received with response rate of (86.3%) of the total sample.

The results revealed that there were statistically significant relationship between Lean Six Sigma dimensions and quality service produced in physiotherapy units at UNRWA Health Centers. Moreover, application of Lean Six Sigma dimensions was practiced at UNWRA Health Centers with rate of (81%) as practices but not as an approach also there is patients' satisfaction about service quality with rate of (89. %).

The study concluded that there was an impact of Lean Six Sigma dimensions on service quality in physiotherapy units at UNRWA Health Centers. The study recommended implementing Lean Six Sigma as practices and approach in physiotherapy units at UNRWA health Centers. Furthermore, employees should be trained according to needs assessment in order to implement Lean Six Sigma successfully, and incentives should be provided to employees based on their performance.

ملخص الدراسة

هدفت هذه الدراسة إلى فهم أثر ممارسات لين ستة سيجما على جودة خدمة العلاج الطبيعي في مراكز الرعاية الصحية بالأونروا في قطاع غزة.

اتبعت الدراسة المنهج الوصفي التحليلي ولتحقيق هذا الهدف تم اختيار مجتمعي دراسة مكونيين من:جميع العاملين في أقسام العلاج الطبيعي بمراكز الرعاية الصحية بالأونروا في بقطاع غزة والبالغ عددهم (٤٩) موظف و المرضى تحت العلاج والبالغ عددهم (٢١٦٥) مريض في أقسام العلاج الطبيعي في مراكز الرعاية الصحية بالأونروا في قطاع غزة . وقد استخدمت الدراسةاستبانتين لجمع البيانات اللازمة لإتمام هذه الدراسة.

قامت الباحثة بتوزيع (٤٩) استبانة على جميع العاملين في الأقسام بطريقة المسح الشامل حيث تم استرداد(٤٣) استبانة بنسبة استرداد (٨٦.٧%)بينما تم جمع البيانات من المرضى باستخدام عينة عشوائية طبقية بلغ عددها(٣٢٧)من مجتمع الدراسة وتم استرداد (٢٨٥) استبانة بنسبة استرداد(٨٦.٣%). استخدمت الدراسة برنامج SPSS للتحليل الإحصائي.

أظهرت الدراسة عدة نتائج أهمها: وجود علاقة ذات دلالة إحصائية بين أبعاد لين ستة سيجما وجودة الخدمة المقدمة في أقسام العلاج الطبيعي بمراكز الرعاية الصحية، كما أوضحت أن لين ستة سيجما مطبقة كممارسات في أقسام العلاج الطبيعي بنسبة (٨١%) ولكن ليست كمنهجية كما أظهرت الدراسة وجود رضا للمرضي عن جودة الخدمة بنسبة(٨٩%).

أظهرت الدراسة أيضاً وجود أثر لأبعاد لين ستة سيجما على جودة الخدمة المقدمة في أقسام العلاج الطبيعي بمراكز الأونروا.

أوصت الدراسة بتطبيق منهجية لين ستة سيجما في أقسام العلاج الطبيعي بمراكز الرعاية الصحية بالأونروا،وتدريب الموظفين بناء على تقييم الاحتياجات من أجل تنفيذ لين ستة سيجما بنجاح. علاوة على ذلك،العمل على تزويد الموظفين بالحوافز بناء علي أدائهم.

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

﴿يَرْفَعِ اللَّهُ الَّذِينَ آمَنُوا مِنكُمْ وَالَّذِين أُوتُوا الْعِلْم دَرَجَاتٍ﴾

[المجادلة: ١١]

Dedication

To become a master at any skill, it takes the total effort of your:
heart, mind, and soul working together in tandem.
Maurice Young
To my martyr brother's soul Ghassan Abu Sharikh
To my compassionate parents who always support studying,
learning and self-improvement
To my supportive husband, daughters and sons
To my lovely brothers and sister
To every one's effort who contributes achieving this humble work
Along with hard working and respected teachers

Acknowledgment

" Be true to yourself, help others, make each day your masterpiece, make friendship a fine art, drink deeply from good books- especially the Qur'an, build a shelter against a rainy day, give thanks for your blessing and pray for guidance every day."

John wooden

I would like to express my deepest appreciation to all those who provided me the possibility to complete this thesis. A special gratitude I give to my supervisor Pro f.Dr Majed El Farra. Another thanks to Dr. Khaled Dehleez who helped determining thesis title, Dr. Khalil Madi and Dr. Nabeel Allouh who gave suggestion about my thesis. I would also thank Dr Kamel Abu Madi who accepted to discuss the thesis . Last but not all, special thanks to Islamic University who gave me the chance to be a part of her master family.

Furthermore, I would like to acknowledge Dr. Ghada Al Jaddba, Chief of Health Department at UNRWA who was cooperative, Dr. Faraj Abu Raya also was helpful along with my colleagues in physiotherapy units. Special thanks to Dr. Amal El Batsh, who supports me in difficult situations.

I would like to appreciate Dr. Randa Radi of facilitating my work in North Gaza Health center. Finally, Dr. Nafez Barakat, the analyst and everyone helped me achieving this thesis.

Researcher
Nabila Abu sharikh

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List of abbreviation

DMAIC	Define, Measure, Analyze, Improve, Control
ED	Emergency Department
JCP	Job Creation Program
LSS	Lean Six Sigma
MSD	Musculoskeletal Disorders
NHS	Nurse Health Service
IOM	Institution Of Medicine
PEX	Palestine Exchange
PT	Physiotherapy
SS	Six Sigma
TQM	Total Quality Management
UNRWA	United Nation Relieve and Worker Agency
VHA	Veterans Health Administration
VSM	Value Stream Map
WHO	World Health Organization
TAT	Time Rounded Time

Chapter 1
Introduction

Chapter 1
Introduction

1.1 Preface

Today, globalization and instant access to information have changed the way business works, so the highly competitive environment does not afford defective work. Quality, process variation reduction, and customer satisfaction have become top priorities of all organizations.

Nevertheless, health care organizations all over the world face so many challenges such as cost, quality, and patients' satisfaction since health care is considered a difficult and complicated process that has a lot of discrepancies. Because of that, health care organizations have been widely attentive to use systematic innovation efforts to remain competitive, save cost, and be up-to date. If an organization is not capable of introducing innovations on an ongoing basis, it will be lagged behind and the initiative will be taken over by other entities (Urbancová, 2013).

To attain this objective, health care organizations desperately need to improve a high- disciplined strategy based on approach that depends on: moving defect from processes, client satisfaction, involving everyone in the organization and removing non-valuable activities. That's why organizations are trying to select Lean Six Sigma (LSS) approach in order to increase service quality, promote client satisfaction through decreasing the cost of processes, increase organizations profits, and has dramatic success in health care industry.

Integrating Six Sigma approach(DMAIC) "Define, Measure, Analyze, Improve, Control" with Lean thinking has multiplied force in industry today (Laureani et al., 2010). Healthcare organizations have applied (LSS)approach after it was fully established, tested, and confirmed by many firms in the manufacturing sector such as Motorola and General Electric (Burgess &Radnor, 2013). Lean Thinking is considered one of the latest conceptions in manufacturing sector and shifting to healthcare is relatively new phenomena according to (Brandao de Souza, 2009) who clarifies the first reference to Lean in UK healthcare by the "Nurse Health Service"(NHS) Modernization

Organization (2001). Lean Thinking and Six Sigma (SS) are two Integrated approaches to increase services quality and reduce defect from processes that are mostly popular in manufacturing sector. Lean thinking targets “non-value added” (NVA) work to make processes more efficient, while Six Sigma focuses on “nonconformities”, or defects, to eliminate errors (Lighter, 2014).

Indeed ,one of the most important, largest, fastest and growing all over the world is the healthcare industry. Practices of (LSS)approach in healthcare industry allows organizations to have competitive advantage, cross-trained manpower, and safe errors-free discrepant processes; moreover, it treats patients with affordable effective cost (Sperl et al, 2013). Many services are produced in healthcare including nursing, laboratories, pharmacy and physiotherapy(PT). For more particular view, Physiotherapy is extremely effective in relieving acute, sub-acute and chronic pain as it helps preventing the risk of increased disability, chronic disorders, complications of injuries, motor accidents and Geriatric diseases conditions(Moon,Bhatia et al, 2015). Physiotherapy also plays an important role in health promotion, disease avoidance and early detection of pediatric conditions. Thus, physiotherapy sector is efficient in managing many health conditions.

In Palestine, as an occupied region, it has been known that many international organizations have physiotherapy programs such as UNARWA and other NGOs. Specifically in Gaza Strip, UNRWA is considered one of the vigorous and major agencies of the United Nations, which is found to serve Palestinian refugees. UNARWA introduces services to Gaza strip in many fields, such as education, health care ,mental health and social services. Nowadays, needs defer from needs twenty or thirty years ago; therefore, UNARWA is working hard to keep up to date with present time needs, from time to time throughout improving new strategies in healthcare sector.

At UNRWA healthcare process ,(LSS) have unique significance since they help sharpen the employee's work and refine his/her character to get him/her prepared to face issues of the day. As a result, an effectively innovative and productive person will be there on both local and international levels. Hopes that this study will add a new conception of (LSS)to the health care sector.

Lean Six Sigma approach is a practical method across all organizations and is data driven so that management effect is diminished as data role will be dominant. Since management sometimes has less influence in lean Sigma organizations than in traditional organizations ,people are often quite surprised at the results of this seemingly simple shift in attitude. The essence of these results is stated quite succinctly. (Pyzdek's, 2003).

1.2 Research problem

Lean Six sigma is considered a powerful business tool strategy. The concepts and approaches of lean and (SS) are widely spread in the healthcare industry (George and skewes, 2003).

Lean Six Sigma focuses on three key components: customers, shareholders, and employees. The primary focus is on customers, but shareholders' interests are not far behind. The necessities of these two groups are derived from using scientific methods ,but the science of knowing what people need is not fully mature yet.The science of people physical, mental, social and health needs is not fully mature too. So that data are enriched with excessive deal of personal contact at all levels of the organizations. Employee requirements are also strongly sought .

In healthcare organizations, (LSS) is commonly defined as 'processes improvement work' (Poksinska, 2010). However, (LSS) in Gaza Strip is not applied as an approach even though some of its practices are applied in health care**.** On the other hand the use of (LSS) in the healthcare in physiotherapy are a relatively new phenomenon in comparative with other health services (Cavalheiro,Caserta Eid, 2015).

Since the researcher is UNRWA staff member, she sensed that some practices of (LSS) dimensions are generally applied in UNRWA clinics and particularly in physiotherapy. Nevertheless, there is a lack of information about this approach, patients complain, and staff are not satisfied. Some of X ray films aren't delivered to the physiotherapy units. In addition, some patients' files are missed during the new admission patients. Therefore, we need to look forward the impact of Lean Six Sigma

practices in Gaza governorate as a tool to improve quality, decrease processes defect and maximize value. Accordingly, the study explore how these practices can affect patients' health .It also studies how (LSS) practices can empower physiotherapists understanding, and it explores factors related to this approach. Then, some suggestions are made to provide solutions for the sake of physiotherapy services improvement.

The study helps gather and present relevant information from patients and physiotherapists to determine the strengths and weaknesses of relevant policies and programs in order to promote and support appropriate care in physiotherapy units. This happens when needed improvements carefully determined. For that sake, the researcher provides answer the following question:

What is the impact of Lean Six Sigma practices on physiotherapy service quality at UNRWA Health Centers in Gaza Strip?

1.3 Study Hypotheses

H1:There is a statistically significant relationship at ($\alpha \leq 0.05$) between lean Six Sigma Dimensions (Define, Measure, Analyze, Improve ,Control)and service quality level in physiotherapy units at UNRWA.

This hypothesis is divided into five sub-hypothesis:

1. There is a statistically significant relationship at ($\alpha \leq 0.05$) between the first dimension of Lean Six Sigma (Define) and service quality level in physiotherapy units.
2. There is a statistically significant relationship at ($\alpha \leq 0.05$) between the second dimension of Lean Six Sigma (Measure) and service quality level in physiotherapy units.
3. There is a statistically significant relationship at ($\alpha \leq 0.05$) between the third dimension of Lean Six Sigma (Analyze) and service quality level in physiotherapy units.

4. There is a statistically significant relationship at ($\alpha \leq 0.05$) between the fourth dimension of Lean Six Sigma (Improve) and service quality level in physiotherapy units.
5. There is a statistically significant relationship at ($\alpha \leq 0.05$) between the fifth dimension of Lean Six Sigma (control) and service quality level in physiotherapy units.

H2: There is a statistically significant impact at ($\alpha \leq 0.05$)of lean Six Sigma Dimensions on service quality.

H3: There are statistically significant differences at ($\alpha \leq 0.05$)in the responses of the research sample related to the dimensions of Lean Six Sigma due to the personal characteristics of the employees (gender, age, Career Level, Years' experience).

H4: There are a statistically significant differences at ($\alpha \leq 0.05$)in the responses of the research sample about service quality due to characteristics of employees (gender, age, Career Level, Years' experience).

1.4 Study General Objective

The research aims to explore the impact of Lean Six Sigma practices on Physiotherapy service quality at UNRWA Health Centers -Gaza strip.

1.4.1 Study Specific objectives

1. To explore existing Lean Six Sigma dimensions among physiotherapists working at UNRWA Health Centers in Gaza Strip.
2. To assess the level of service quality from patients' perspectives attending UNRWA health centers in Gaza Strip.

3. To investigate the impact of lean six sigma dimensions on service quality at UNRWA Health Centers.
4. To discover the differences among respondents related to Lean, Six Sigma and service quality at UNRWA health centers
5. To highlight recommendations and suggestions for improving physiotherapy health care at UNRWA Health Centers.

1.5 Study importance

Physiotherapy is a drug-free health care service. Physiotherapists work in collaboration with individuals of all ages to remove the obstacles of physical function including working with patients' pre and post-surgery and helping people come back from illness, chronic disease, and injury (WHO,2004). The Lean Six Sigma process is highly measurement and data driven (Koning et al., 2006; Antony et al., 2003).Data has to be gathered to determine the baseline performance of processes in order to validate that an improvement has been made. There are many studies which discussed quality management, but until now few studies have explored lean six sigma in health care in Gaza Strip. The only study the researcher has found is about Six Sigma application feasibility and its role in improving the quality of health services in government hospitals from the perspective of senior management (Jawada,2011). In Gaza, no studies have been conducted to explore the impact of Lean Six Sigma practices on physiotherapy service quality at UNRWA health centers.

This study acquires its importance from focusing on a topic that is rarely discussed by researchers in their studies for being sensitive and hardly measured in the practical life. The study also focuses on the largest working organization in Palestine, the UNRWA and its employees' point of view regarding the Lean Six-Sigma approach. In addition, the study is distinguished because it opens new horizons for researchers and interested individuals in health care sector.

1.6 Study Variables

1.6.1 Independent variable:

Lean Six Sigma dimensions

- Define.
- Measure.
- Analyze.
- Improve.
- Control.

1.6.2 Dependent variable: Service Quality

Figure (1.1): Study Variables

Source: (Prepared by researcher based on Aljumaily ,2014)

1.7 Operational Definitions

1.7.1 Lean Six Sigma

Is one of the most recent and well-established approach that helps controlling healthcare costs, improving quality and providing better healthcare (De Koninget al., 2006). Lean Six Sigma refers to an integrated entity: lean and Six Sigma. It targets every type of opportunity for improvement within an organization (Pepper, Spedding, 2010).

1.7.2 Physiotherapy care

Physical therapy provides services to individuals to promote, preserve and restore maximum movement and functional ability throughout the lifespan. (World confederation physical therapy, 2007). According to (Australian Physiotherapy Council), Physiotherapy involves the complete approach to the avoidance, finding and therapeutic management of pain, disorders of movement or optimization of function to enhance the health and welfare of the community from an individual or population perspective.

The researcher has a compromised definition based on the previous definitions: Physiotherapy helps people affected by injuries, illness or disability to restore movement and function through physical treatment and change of daily life activity.

1.7.3 Service quality

Service quality can be defined as an overall judgment similar to attitude towards the service and generally accepted as an creator of overall customer satisfaction(Munhurrun,Naidoo et al., 2010). Whereas (Al-Mahiaoi,2006) based on (Suliman ,2013) statesthat service quality as standards for matching and comparing between the actual performance of service and customers' expectations. The researcher depends on the former definition at her study. `

1.8 Limitations of the study

The researcher's place of work has given her an advantage for fewer limitations. However there have been some limitations:

- Lack of resources and materials about the study of concern.

- The crowding also may make the patients in stress as they want to go home quickly.
- Long period electricity cut off has proven great limitation since the patients flow is arranged according to the appointment system, so the patients rearrange their work and home affairs according to schedule of electricity.

1.9 Conclusion:

This chapter highlighted on a general background of the study, problems, research questions, research hypothesis, objectives of study, and the importance of this study. It clarified independent and dependent variables, the operational definitions and finally the limitations of study.

Chapter 2
Literature Review

Chapter 2
Literature Review

2.1 Introduction

The most important goal of this chapter is to situate the current study within the body of literature. This chapter aims to clarify the concept of Lean Six Sigma approach (LSS), health care, and physiotherapy in the light of available literature .In addition, it identifies Lean Six Sigma philosophy, application, evolution, levels of this concept, and challenges that faces lean six sigma in health care. The chapter also provides a brief history about UNRWA in Gaze Strip and its services.

2.2 Lean Thinking

Lean conception as far as covers the scope of the Toyota production philosophy by providing an enterprise-wide term that adapts together the five elements of "how to improve product, process, to choose the supplier, to deal with the customer, and to focus on the flow of process for the whole enterprise" (Holweg, 2007).

This approach was settled at manufacturing sector shortly after the Second World War, established by Taiichi Ohno, while hired by the Toyota motor company .The first pillar of Lean was provided by Toyota Production System (TPS) for what is now identified as Lean thinking, and was recognized as value-added and non-value added activities, and to eliminate all waste functions within the system (Pepperand Spedding,2012).

Lean thinking illustrated that conception into value also provides a way to make work more satisfying by giving fast feedback on efforts to convert into maximum value, and to stay in the same line with the latest trend for process reengineering. It corrects the way to arrangement new work instead of destroying jobs in the name of efficiency. The most critical preliminary point of lean thinking is value. The most correct definition of value can only be confirmed by the customer (Womack and Jones, 1996).

Nevertheless the main goal of lean is to eliminate waste and non-value-added parts in any process. Unless a process has gone through lean multiple times, it contains some elements of waste. When Lean completed correctly, lean can generate massive

improvements in efficiency, reduces cycle time, material prices, leads to lower costs, increases productivity, and advances competitiveness.

2.2.1 Definition of lean

Lean is a methodology value stream, aimed to maximize customer value, minimize waste, reduce excess inventory, meet customer demand and eliminate overproducing products. The main focuses on removal of waste, which was clarified as anything not necessary to produce the product or service (nave, 2002).

The first conception of lean was produced by (Womack, and Roo,1990) in their book when they talked about the machine which changed the world. On the other hand, literature has shown many definitions of lean. Some of them mentioned Lean is associated with seven important forms of waste which included overproduction, defects, unnecessary inventory, inappropriate processing, transportation, waiting, and unnecessary motion (Shah and Ward, 2007).

As well as, (Dickson,CheungandNugen ,2009) illustrated that the corner stone of Lean concept is the relentless elimination of waste through the calibration of processes and all employees should be involved in process improvement (Womack et al., 2005). He also states Lean thinking is not a manufacturing tactic only, but a management strategy that can be applicable to all organizations improving processes.

2.2.2 Development of Lean

In 1890, Taylor was the first to study work management scientifically (Hineset al., 2004). While (Ford's ,1910) created the vision of mass production ideas about continuous assembly lines and flow systems, the second phase was produced by Taiichi Ohno .Toyota implemented Lean approaches to reduce inefficiencies and improve overall value to customers. Seemingly, the first birth of lean was in Japan within Toyota the 1940s.

Melton (2005) mentions that Toyota Production System focused on the willingness to produce in a continuous flow which did not rely on long production. He clarifies that saving a small portion of the total time and effort to process will added value to the end customer. World runs to be efficient.

The conception of Lean thought was described as: "The machine that change the world" in Womack and Jones' book when they introduce Lean Thinking in the fall of 1996 as they made a hint for the recession of 1997 and the financial crisis of 1998. Lean thinking in 1996 mission was to explain how to get beyond the financial games of the 1990, to create real, lasting value in any business (Womack, et al., 1996).

Table (2.1): shows lean improvement between (1975- until now)

Toyota Production System	Lean Production, Lean Manufacturing	1998 – Lean Six Sigma	Today – Operational Excellence, The Lean Startup
1975	1988	1998	Today

(Source: Prepared by the researcher based on Womack et al., 1996)

2.2.3 Lean Principles

Lean approach is determined by the explanation of customers' needs, and its main purpose is to improve processes by removing non-value-added activities (Varkey, &Reller et al.,2007). Therefore, identifying lean principles is essential for both manufacturing and services sector.

Henry Ford at the beginning of 1990 cited seven lean principles as:

- Remove waste products.
- Reduce waste of waiting time .
- Eradicate waste time in transportation
- Eliminate waste of processing itself
- Exclude waste of excessive stock .
- Facilitate of movement.
- Eliminate defects of products, according toFliedner (2008).

Whereas, Wiley, Eriksson& Lindskogetal. (1996) and HouchensandKim(2014) identify lean principles from seven to five:

- Identify the value desired by the customer
- For all process, they identify value stream providing that value and challenge all of the wasted steps (generally nine out of ten) currently necessary to provide it.

- Enhance the product flow continuously through the remaining value-added steps.
- Introduce space between all steps where continuous flow is possible.
- Decrease the number of steps, the amount of time and information needed to serve the customer continually in order to manage toward perfection.

2.2.4 Lean Conception Today

As Toyota was the leading to use lean in production, it achieved success in every things like: rising sales, marketing shares in every global market. Thus, success was continued over the past two decades, and wide knowledge about lean thinking was found. Therefore, lean thinking has been widely extended to every country in the world, managers and leaders are also adjust the tools and principles beyond manufacturing to other sectors like logistics, distribution, services, retail, healthcare, construction, maintenance, and even government .Indeed, lean perception and approaches are only the beginning to take root among senior managers and leaders in all sectors today(2000-2017 Lean Enterprise Institute).

2.2.5 Importance of Lean

The conception of Lean can be defined as tools and techniques that stimulate organizations to continually add value to products or services by enhancing process steps that are necessary. Another view point of lean was mentioned by(Yehand Lin et al. ,2011)who concluded that Lean is being spread as a management conception in different sectors. Its benefits has known as removing non value added process, saving lead times for customers, reducing inventories levels for manufacturers and improving knowledge management. As a result, lean has become a very real and physical concept especially for manufacturing(Melton,2005).As previous studies concluded, the important role of lean in facilitating process is saving time, and cost. Consequently, this approach helps gain best performance and quality.

Lean in the healthcare is considered a simplified processes by understanding what adds value to reduce waste. Sometimes, the current healthcare systems consist of fragmented processes which require a shift in how the flow of patient care is perceived and organized (Poksinska,2010). Poksinska mentioned that applying lean thinking has

the potential to help break down the silo mentality and facilitate changes to occur across functional boundaries .Lean, as well as, includes philosophical aspects such as values and principles (Liker, 2004).

In healthcare it is commonly defined as ‘process improvement". Briefly Lean is a method of organizing a process, resulting in improved revenue, dropping costs and enhancing customer satisfaction (Maleyeff,2007).

2.2.6The Challenges Facing Application of Lean in the Services Sector

Elnadi, Shehaband Peppard (2013)clarify that there is contradiction about whether or not manufacturing and service operations can be managed using Lean. Grönroos (1990) claimed that services are more intangible activities or a series of activities rather than things and the customer can have participation in the production process, so quality is services is difficult to be measured, based on (Kang, 2004). Elnadietal(2013) mentioned how lean ideas were transferred from manufacturing to services if they were employed with minor alteration. Similarly (Swank, 2003; Delgado&Ferrerira ; 2010) confirmed that lean approach can be transferred to services sector although health services is a complex sector facing finance and quality challenges while Ahlstrom (2004)illustrated that the principles of Lean manufacturing can be suitable in service operations, but with contingencies. As the previous literature shows, the researcher can summarize the main challenges in using Lean in services as follows:

- Services are intangible, so it difficult to be measured.
- Lack of top management commitment.
- Cost problems.
- Data process is not always available.
- None defined and clear customer needs.
- Employees need more training to apply Lean methods.

All over the world, it is known that challenges facing health industry today is different from place to another, from private sector, governmental or UNGO, but the most common challenges are: finance, man power, workload, in appropriate health system. Therefore, there is an real need to develop suitable management tools to handle

these challenges and achieve service quality in order to maximize customer value with high efficiency making use of lean approach(Elnadi et al., 2013).

2.3 Six sigma(SS)

2.3.1Introduction

In 1985, Motorola INC in the USA organized Six Sigma conceptions to face the Japanese force while the Japanese were trying to make drastic improvement of quality in the electronic industry (Schroeder,2000).

Six Sigma is a collection of processes improvement tools used in a series of projects in organized way to achieve high levels of stability. It is created by principles established up by quality experts, such as Deming, Juran, Shewart and Ishakawa based on (Salahand Carretero, 2009). Quantitatively, they claimed that Six Sigma quality illustrated that only 3.4 defects per billion opportunities fall outside the upper and lower specification limits. This is almost a zero defect. Six Sigma represents a new trend of the quality management evolution (preceded byTQM evolution) towards operational excellence (Basu, 2004). We should distinguish between the definition of TQM is and the definition of Six Sigma but the aims are similar (Anderson et al., 2006).Achieving competitive advantage needs an important strategy such as quality management to be established because adapting a new customer requirement is of a vital importance for long-term success. This reflects the ability of the organizations in a globalized market. Nevertheless, traditional quality initiatives such as statistical quality control, zero defects, and total quality management have been key initiatives for many years. However, in last two decades, Six Sigma has grown as a new quality management initiative and now many organizations are working towards its implementation (Tan & Chakraborty, 2012).Six Sigma is defined as a customer oriented, structured, systematic, proactive and quantitative companywide approach for continuous improvement (Gupta,2013).Nevertheless, Six Sigma approach has been saving millions of dollars since it was applied to manufacturing sector at Motorola company. Transferring Six Sigma approach to services sector is very important to achieve this goal and maximize customer value which is needed in health sector to be highly competitive.

2.3.2 Definition of Six Sigma (SS)

Sigma is the 18th letter in the Greek alphabets, and statisticians have used this symbol to denote standard deviation (park, 2003). Six Sigma is a management philosophy that targets reducing variation and defects in a process. SS is based on reducing defects by 3.4 opportunities per millions is the target level of performance (Bridge,2016). Shroeder(2000) says that a true Six Sigma (6σ) process is 99.9997% defects free and very near to perfection.

Taner and Sezen (2007) conclude that being a quantitative decision-making initiative, Six Sigma is one of the most powerful performance improvement methodologies that are changing the face of modern healthcare delivery today. Additionally, they claim Six Sigma depends on hard statistical methods, and implements control mechanisms in order to link together quality, cost, process, people, and accountability. It is based on understanding of customers' needs, and values. Chiarini(2013) states that SS is a disciplined business methodology to excess customer satisfaction, profitability by enhancing standardized operation, improving quality and eliminating errors in processes, and improving business performance. Breyfogle(2003) claim that several authors such as(Carr and Littman, 1990; Ho and Fung 1994; Klefsjo et al.; 2000; Salah et al., 2009) mention SS can be used as a management tool in designed system that leads towards business excellence .

Recently, SS has become a highlighted approach along with quality management focusing on high effective implementation principles of proven quality and techniques that reduce error. Pyzdek (2003) says that using the Six Sigma DMAIC approach in both services and products are improved in the sense that they are more effective, or more efficient, or both .Anbari (2002) points out that "six sigma is more comprehensive than prior quality initiatives such as Total Quality Management (TQM) and Continuous Quality Improvement (CQI)".

The Six Sigma method includes measuring and analyzing financial outcomes, using additional more advanced data analysis tools, focusing on customer concerns, and using project management tools and methodology that lead to be more distinction.

2.3.3 Evolution of Six Sigma

Six sigma is a conception was organized by Motorola Company and it has passed through many phases (Schroeder, 2000).Chakra borty(2012) produces that SS is considered an official methodology for measuring, analyzing, improving, and then controlling processes. The most powerful point of Six Sigma is located in its well defined framework involving methodology applying different tools and techniques. Six sigma is a business tool strategy aimed to reduce defect, and improve quality, and has been evolved through many stages from three to six levels. Thus, Six Sigma can be a vision, a philosophy, a symbol, a metric, a goal, and a methodology.

- The root of six sigma can be traced to Carl Fredrick the first one who introduced the conception of normal curve (1777-1855).
- Then Walter Shewart (1920) introduced Six sigma as a measurement tool in product variation.
- In the med of (1980), Motorola engineering found that the traditional quality measurement of product variation didn't provide enough granulation, therefore they developed management and data driven tool, six sigma methodology to face such challenges and saved 16 billion $ as result.
- Both Harry and Smith worked together on Six Sigma initiative. In the mid-1990s, Larry Bossidy of GE'sand Jack Welch saw Six Sigma a way to lead their organization. Since that time, SS has been applied in many sectors as the most important management tools. The chart below explains the evolution of Six Sigma.

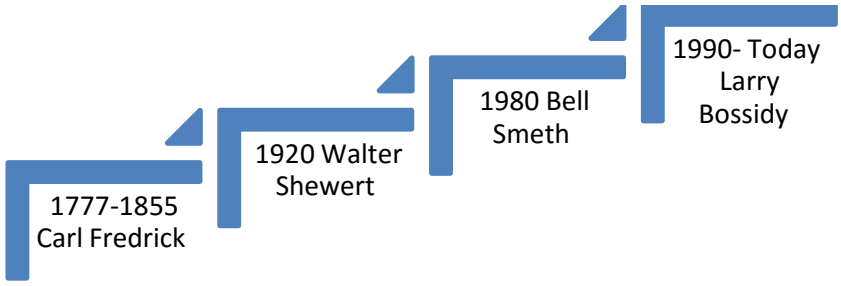

Figure (2.1): Evaluation of Six Sigma

(Source: Prepared by the researcher)

2.3.4 Levels of Six Sigma

Six sigma is delivered from total quality management (TQM) as a measuring tool responsible for quality of product and services, and it is divided into six levels. Statistically, it decreases defect by 3.4 per million opportunities.

Table (2.2): below estimates levels of six sigma and its percentage between quality level and defect units

Serial number	Sigma yield	Defect per million Opportunities (DPMO)
1	31%	690000
2	69.20%	308000
3	93.30%	66800
4	99.40%	6210
5	99.9777%	230
6	99.99997%	3.4

(Source: shroeder, 2000)

2.3.5 Methodology of Six Sigma

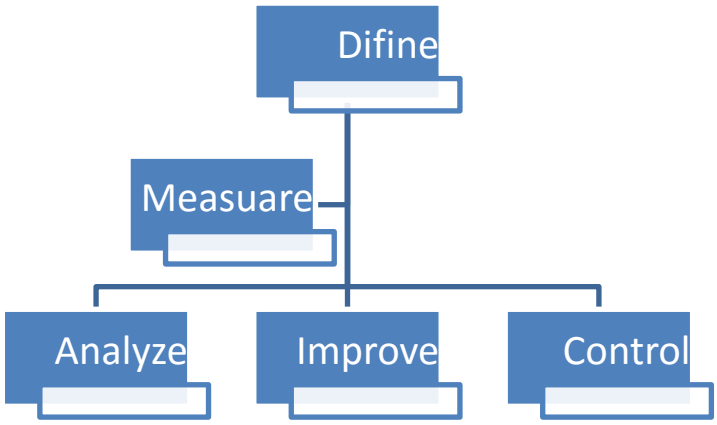

Figure (2.2): Methodology of Six Sigma

(Source :Prepared by researcher based on Aljumaily, 2014)

If you can't measure, you will not manage. We don't have faulty people, but we have faulty processes (Lanham, 2004).As Six sigma has two methodologies (DMADV) and (DMAIC) the researcher has chosen (DMAIC) Six Sigma Model to asses lean six

sigma practices and service quality among physiotherapy units in healthcare in UNARWA. Garrison, et. al. (2010) and (Aljumaily,2014) define this methodology as:

1- **Define:** This phase defines road mapping, project authorization, problem solving definition, tools and team work in organizations.
2- **Measure:** This phase defines data collection plan, registrations processes, future more Input and output and puts the initial report about work.
3- **Analyze:** This phase defines collecting, analyzing ,classifying data in statistical form of the organizations accounting system using quantitative and qualitative methods.
4- **Improve:** This phase selects alternative solutions, uses delegation in the organizations, works in structured framework to remove mains root causes.
5- **Control:** This phase is when appraisal performance is done and training after that is administered, too.

Long, Lin et al., (2011) clarifies the first phase of (DAMIC) methodology **Define** as what problem would you like to fix?. The second phase **Measure** is how the process performs. The third one **Analyze** introduces what data tells. By producing the fourth stage **Improve,** the problem will be fixed. It's time to move on to solution development. The last stage **Control** shows newly achieved improvements sustain? DMAIC is known as a method to eliminate discrepancy and defects. Six Sigma makes use of a structured approach and statistical tools to find the main root causes behind problems and to get-up-and-go with processes toward near-perfection (Taner& Sezen, 2009). Thus, applying this methodology keeps organization in the correct way towards continuous improvement and towards distinction.

2.3.6 Philosophy of Six Sigma

The most powerful strategy tools for improvement quantitative decision-making is Six Sigma as it changes the face of modern healthcare delivery today. Many organizations and industries manufacturing and services have implemented (SS) as an optimization tool to be involved in as a cost-effective way to improve quality and productivity(Tolga, 2009). According to(Pyzdek,2003),six sigma philosophies are:

- Try to get accessibility and observation some important aspect of the market place

- Put preliminary explanation, or hypothesis, corresponded with your observations.
- Depend on what you explained, put your hypothesis, make predictions.
- Lately, make sure that your predictions are tested by conducting experiments or making further careful observations. Record your observations, and rearrange your hypothesis upon the new facts. If dissimilarity still exists, use statistical tools to help you separate signal from noise.
- Repeat many times until there are no discrepancies between the hypothesis and the results from experiments or observation (Pzydac, 2003).

2.3.7 Principles of six sigma

Many authors have talked about the principles of (SS) and how it facilitates processes to reduce defect and maximize value. Pande and Holpp(2002) produce these principles:

- Main focus is on customer and employee.
- The management is totally data driven.
- Focus is on internal process and activity.
- Correct planning is essential.
- Co-operation is a key.

2.3.8 Standard of Six Sigma

Antony and Bhaiji(2003) ,Salaheldin and Abdelwahab(2009) and (Durgham, 2012) introduce the following standards for six sigma:

- Commitment and support of top management.
- Feed back
- Continuous improvement
- Process and systems
- Humans resources

2.3.9 Importance of Six Sigma

Six Sigma is business tool strategy, techniques and statistical way to document data which is used to over more complex problems that need in-depth analysis. A lot of literature was studied about the importance of (SS) showing the result of (SS) usage:

- Because (SS) depends on data, it maximizes customers' needs and satisfaction, minimizes cost and processes defects.
- It increases innovation to meet customers' needs.
- Deployment of (SS) raises profitability and reduces cost. (Financial results).
- It increases return on sales and investment.
- Six Sigma decreases processes defect and focuses on the process improvement.

2.3.10 Disadvantages of six sigma

Although SS has several advantages, (Aljumaili, 2014) concludessome disadvantages of (SS)as follows:

- Being very specific and measuring 3.4 defects per million as a standard, SS leads to more time spent in areas which are less revenue, so it may look difficult.
- Why the levels stop at 6 levels?
- Difficulty to apply (SS) in services sector.
- Six sigma concentration on rigidity of processes opposes innovation and skills.
- The innovation leads to uncommon solutions.
- Needs many skills and power .
- Many challenges facing SS when transferring from the theoretical concepts into practical applications. Therefore, there are lot of actual obstacles which need to be resolved.

In deed Six Sigma methodologies have found wide acceptance in the business today. It is developed from 3 levels to 6 levels, reduced cost, and it increases customer satisfaction. However, some challenges are still found, so they thought to add lean thinking to keep more competitive advanced.

2.3.11 Six Sigma Belts

Another important conception about SS is six sigma belts. Business needs a leader to manage work as well as a strategy to be followed. Six Sigma has three important belts. When reviewing the roles that contribute to a successful process in huge organizations, Six Sigma are the champions whose be led by a full-time, high-level champion, such as a Chief Executive (Munk, 2014).

In all organizations, daily work or routine work has champions that also include casual leaders who use Six Sigma and translate the Six Sigma message at every opportunity. Pyzdec(2003) describes the belts as follow in his book:

- **Black Belt**– The person who are responsible for evaluating, refining and controlling specific processes that affect the satisfaction of customer and productivity growth.
- **Green Belt**– Similar to Black Belt but has less time than black belt in his position.
- **Master Black Belt**– Take the function from the name Master. They re-evaluate and advise other belts. How to choose Master Black Belts? They are of special criteria and quantitative skills that help them teach and mentor. Master Black Belts are full-time positions.

It has been known that Six Sigma put customer in the first line. Then, it analyzes and evaluates data processes controlled by daily work, so it is very obvious that the success of an organization does not depend on quantitative factors only, but also depends on human efforts.

2.3.12 Challenges to apply Six sigma

All over the world, there are many obstacles facing healthcare organizations such as quality problems and client satisfaction. The Institute of Medicine produced two reports proving healthcare has serious safety and quality problems, and is in need of important change (IOM 1999,2001)**.**

The first priority for companies is service quality that differentiate their services in a highly unique process, and is often an aggressive environment (Nakhai,2009).Although (SS) is a continuous improvement process, there are a few

common barriers in successfully implementing Six Sigma in an organization according to (Munk, 2013)as follows:

- Lack of leadership commitment to Six Sigma.
- Incomplete understanding of Six Sigma approach.
- Poor Execution.

Challenges to deployment of (SS)strategy in healthcare are to discover a way to leverage the data from Six Sigma to drive human behavior. Success will be achieved by integration between the Six Sigma technical strategy and a cultural strategy for change hurrying and an operational mechanism (Lasarus, Ian, and Neely, 2003).

2.4 Lean Six Sigma

2.4.1 Introduction

An integration of two different programs for achieving operational excellence in Major US companies helps leaders realize innovation opportunities and promote a company-wide culture with leaning toward novelty. This is called a lean Six Sigma approach or sometimes just (LSS) which focuses not just on efficiency but also on growth(Byrne and Lubowe et al., 2007).

According to(Salahet al., 2009) both Six Sigma and Lean are considered a consistent relationship with each other. Nowadays, many companies are using a combination of both applications which is called the LSS program.

The concept of lean and Six Sigma is a new approach to continuous improvement that has not established into a specific area of academic research yet (Bendell, 2006).

Lean Six Sigma came out from a competitive conversation between East and West about efficiency and customer satisfaction. It represents the world's best experience-tested wisdom about using the least to produce the best."(Donegan and oadvine, 2013).

2.4.2 Definition of Lean Six Sigma

Mousa(2013) explains the concept of Lean Six Sigma as the latest concept of TQM and process improvement into manufacturing and service sectors. Lean Six Sigma is a business tool strategy and methodology that focuses on process performance to

eliminate waste to enhance customer satisfaction. It is also recognized that Lean Six Sigma is an effective leadership advance tool.

Welch, 2005; Bendell, 2006; Pepper and Spedding (2010)agreed that Lean Six Sigma is a management approach that integrate Six Sigma methods and tools with the lean manufacturing. It is a combination of waste removing and process improvement techniques.

2.4.3 Combination of Six Sigma and Lean

Lean Six Sigma encompasses many features of lean and six sigma such as focus on customer satisfaction, culture of continuous improvement, search of root cause, and comprehensive employee involvement (Maleyeff, 2007).

How Lean contributes with Six Sigma

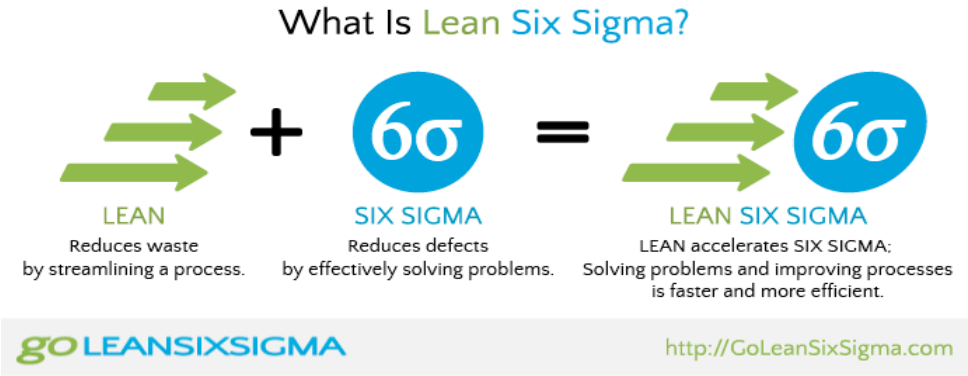

Figure (2.3): What is Lean Six Sigma

Zugelder(2012) mentions Lean and Six Sigma paired of a relationship with each other. Lean Six Sigma is suitable for the leading continuous improvement technique used by companies in several industries transferred from manufacturing to health care to Information Technology.

Lean Six Sigma maximizes value and efficiency, and it helps control every step of the processes (George, 2003). The Six Sigma method provides an effective embedding framework according to the project-by-project approach of applying Lean principles (Ahmed and Islam et al., 2013).Nevertheless, the conception of the both approaches are used to describe the integration of lean and six sigma (Pepperet al., 2010).

On the other hand, (Assarlind andGremyr ,2013) conclude that companies struggle for operational excellence should apply Lean and (SS)as common processes improvement methodologies. “Lean Six Sigma” or “Lean Sigma”. In fact, there are different cultures and values in any organizations, so the work flow has been affected and some discrepancies. Thus, the usage of (LSS) has attracted wide attention around the world(Bendell, 2006).

Snee(2010) proposes that process performance goals establish the business case, and that deviations from goals leads directly to Six Sigma projects. While (Bhat,2014) considers lean value stream and six sigma reduce defect processes. The integration of both approaches could attain better outcomes than other methodologies could achieve alone.

Using (LSS) in organizations give the chance to accomplish business excellence by merging the collected data based on analytical aspects of Six Sigma with the operational and cultural aspects of lean through a lean Six Sigma deployment model that highlights the best features of each methodology (Ramaswamy, 2007). From the application of (LSS) methodology, organizations reduce cost, waste, and effort to meet customer value. Integration of the two approaches give better results hence Lean removes non added value processes and (SS)reduce processes defect.

2.4.4 Why Lean and Six sigma need each other

Table (2.3): explains how lean and (SS) integrate each other.

Lean needs Six Sigma because:	Six sigma needs Lean because
Lean cannot explain the role needed to start project to attain specific results. It identifies waste.	Six Sigma sub-optimizes processes Decrease process defect.
Delivering a collection of tools to know problems and sources of difference.	It improves process speed/cycle time
Lean does not identify the influence of Deviation	It includes methods for continuous improvement (Kaizen)
Lean is not as strong in the measure and analyze stages of DMAIC	Six Sigma quality is approached faster if lean eliminates non value-added steps

Source: (Bevan, Westwood, Croweet et al.,2005**)**

2.4.5 Lean Six Sigma Tools

In different sectors of industries, the most valid and important management tools is (LSS)approach. There is a series of accessible tools. One of the most common used is (DMAIC) methodology which stands for: Definition, Measurement, Analysis, Improve of solutions, and Control of the process(Hors& Goldberg,2012). The researcher works on the (DMAIC) methodology in this research because of its benefits in maximizing customer value. (LSS)and its tools has directly affected and formed an impact in the operations of many companies. Lean and Six Sigma tools can be utilized to promote developments in quality both as a system and as a manner (Breyfogle, 2003).The researcher focuses on the most important tools.

Roy (2017) briefs Lean tools and principles integrating to Six Sigma as follows:

- **Value stream mapping**: analyze of (DAMIC) methodology.
- **Tact time**: it is a German word translates into "beat" means that the time needed to finish work.
- **Ishikawa** (**Cause-and-Effect**) Diagram instead of using statistical ways to clarify the cause.
- **5Whys**: the 5 Whys – should asking five times, leading the task more manageable.
- **Heijunka** (**Load Balancing**): A Japanese term uses a design to production system to provide a more and regular flow of work.
- **Poka-yoke (Mistake Proofing):** A Japanese phrase means adjustment process to avoid profit mistakes in a new system altogether with DMADV (Define, Measure, Analyze, Design, Verify).Another conception of lean six sigma tool is the role of (LSS) which the employee is not wrong but the process. The tools of (LSS) according to (Breyfogle,2007) are:
- **One Piece Flow**: One-piece flow means how the sequences of product or of transactional activities (through a process)happen.
- **Visual Management:** visible management shows both visible information and visible control of processes (display and control).

- **The 5S Method:** Creation of consistent work is a primary reason for using the 5S method. It includes: Sort, Straighten, Shine, Standardize, and Sustain.
- **Value Stream Mapping** it plans to ensure the flow of processes when the managers decided to install Lean systems.
- **Kaizen:** is another pervasive tool since it is a focused methodology that uses teams for making improvements. It means continuous improving of production or services frequently needed. The main objectives for these tools are reducing time, cost, waste and maximize customer.

Being a physiotherapist, the researcher treats patients who come to consultation, registers data on a daily basis and gives feedback to line management. The work should flow easily, so any waste process should be eliminated. As lean six sigma helps to reduce cycle time and eliminate waste, she highlights on waste in order to be avoided and focuses on value to be maximized.

2.4.6 Some Forms of Waste in Lean Six Sigma

Since Taiichi Ohno is considered the father of Toyota Production System, he produced framework of lean production based on maximizing output from least input.

Any process or step that does not add value for the customer is considered waste or "muda" and must be eliminated. According to (MCGee Abe,2015)the abbreviation for the eight wastes are:

- **Defect:** Any mistake affects the quality and needs more time and money to be repaired.
- **Over production:** It happens when workers continue producing even after needed orders have been finished. It can draw up the working capital. It is especially common in manufacturing, but it can occur in any workplace.
- **Waiting :**It means time is waste when the workers taking long time transferring from one step to another or when changing materials. This type of waste is widely seen within businesses today.

- **Transportation:** It is a major challenge facing the manufacturing sector since products should move in or out the place of product for supply. Transportation needs accurate time, experience and skills.
- **Inventory Excess:** This waste occurs when there is a gap between the demand of customer and the actual supply of markets.
- **Motion Waste:** It is any extra movement whether by employees or machines that does not maximize value of product, service or process.
- **Excess Processing:** It sometimes happens due to the processes defect which use process more than required or using long-winded poorly designed processes.

Womak andJones (1996) list seven forms of waste:

- Excess production.
- Needless inventory.
- Defect
- In appropriate transportation
- Excessive transportation
- Waiting and.
- Unnecessary motion.

(LSS) is figured out to beneficial in production or service sectors maximizing profits and increasing customer satisfaction.

2.4.7 Benefits of Lean Six Sigma Approach

Lean Six Sigma is a Strategic process that enables organizations to maximize customer value by improving quality, speed, customer satisfaction, and reducing costs. Albliwi and Antony(2013) produce the above goals to accomplish integration tools and principles from both Lean and Six Sigma based on(Laureani, Brady and Antony ,2012). Clark(2015) has clarified the following benefits of the Lean Six Sigma approach:

- Increase Efficiency.
- Higher-Quality Output.
- Better Customer Service.
- A Safer Workplace.

- Program Implementation. Maximize customer and employee satisfaction.
- Drop costs.
- Improve business.
- Improved reputation and keep it better
- Increased competitive advantage.
- Encourage staff.
- Understand customer needs.

LSS programs are dynamic processes and need to be continuously and objectively reviewed to improve opportunities. LSS is a continuous cycle of process creation, process management and process improvement.

This table shows the difference between Lean and Six Sigma.

Table (2.4): the difference between Lean and Six Sigma

Lean	Six sigma
Insist on value What is the need of the customer?	**Define** What is important?
Identify the value stream What is the entire value stream?	**Measure** How the work will be done?
Flow Observe the flow of material through process?	**Analyze** What is wrong?
Pull How can we attract customer to our product rather than pushing product?	**Improve** What's a need to be done?
Perfect How can we utilize our resources in process ?	**Control** How we give strength to work**?**

(Source :Helen Bevan and Neil Westwood etal.,2005)

Although there are differences between the two methods, but they also complete each other as the previous study mentioned.

2.4.8 Similarities between Six Sigma and Lean Manufacturing

The researcher here focuses on the similarities between the two methods Mousa(2013) lists some similarities between Six Sigma and Lean as follows:

- (SS) and lean require a high level of management commitment.
- Implementation is a part of a strategic plan of both methods.
- Both represent a culture change for the organization.
- Both require input from all levels of the organization.

- Both have systematic structures.
- Both concerned with elimination of waste according to Breyfogle(2003).

2.5.9 The effect of Lean Six Sigma on Healthcare Industry

Health care is a product of several factors and branches of sectors in allied way such as dentistry, midwifery, obstetrics, medicine, nursing, optometry, pharmacy, psychology and other care providers (WHO, 2014). Health is a part of our concern and worry.

In spite of our age, gender, socio-economic or ethnic background, health is the most important thing we have asset to deserve. Health helps us keep going to school or to work(WHO, 2005).

Healthcare is a service that has some distinctive features since its customers are patients in addition to their family and friends. Six Sigma and Lean are common quality improvement tools aim to permit health care managers the chance to improve health care quality(DelliFrain, Langabeerand Nembhard ,2010).

Rapid and continuous change in the surrounding complex healthcare environments is considered a challenge, but it can also be adaptable. The need to competitive advance is increased in business as well as in healthcare.

(LSS) enables organizations to reduce inconsistency waste with fewer errors, and it makes processes better as well as adding value to patients' care. It enhances better patients' satisfaction rates and more productive employees ,and that reflects positively to quality improvement.

(LSS) is based on the knowledge, methods and tools derived from decades of operational improvement research and implementation(Mozammeland Mapa, 2011).

Ahmed and Manaf (2013) concluded that both Six Sigma and Lean have integration relationship with each other in increasing the quality of services by dropping costs and eliminating wastes. Previous studies present the most and important obstacles facing healthcare industry are patients' safety and quality problems.

Healthcare processes are described with discrepancies, complex characteristics and unnecessary duplication of services as well as long waiting times and delays for the patients.

Moreover healthcare is an industry that can be described as “Data Rich, but Information Poor.” (Nelson, 2010).Otherwise, high costs and generated wastes are identified as important providers to the increase in healthcare expenditures (Heuvel et al.,2006).

Jorma, Tiirin and Bloigu et al., (2015) highlight the outcomes of the lean thinking employment when used in the healthcare environment. They focus on the expectations for lean thinking in the Finnish public health care. However not deeply implemented ,they find that lean thinking is a new concept mainly used as a development tool to seek financial savings and to improve the efficiency of patient processes.

Nonetheless, the practices of Lean applications and results have been positive, and the methodology is already quite well-known. Indeed, the Institute for Healthcare Improvement has advocated for healthcare leaders to take up the (LSS) approach for this purpose (Bevan et al., 2008.)

Lean Six Sigma is a methodology widely followed by organizations in manufacturing sector because organizations and individuals need a approach for improvement and problem solving as processes do not get enhanced by themselves.

Although healthcare organizations produce a vital and critical services, some patients’ demands are not fully obtained.

Patients are still not satisfied of service quality. To fulfill patients’ expectations, healthcare organizations must follow quality management practices such as Lean Six Sigma (LSS) approach (Ahmed et al.,2013).

Based on previous studies, the researcher's point view on (LSS)on health care industry is a complementary way to maximize patient satisfaction, save waiting time, reduce cost and help the organization to be provide distinguished services.

2.5 Quality

2.5.1 Introduction

The conception of quality has been recognized by different people. In a manufactured product, the customer as a user recognizes the quality of fit, finish, appearance, function, and performance, but the quality of service may take another way to be explained based on the degree of satisfaction by the customer receiving the service (Chandrupatla,2017).

On the other hand, In health care industry(Atinga andAbuosi,2013) explained that healthcare clients in developing countries are progressively becoming aware of their right to quality health care ;therefore, providing quality services in healthcare organizations is gaining a great attention in literature (Amponsah and Hiemenz, 2009).

In these days, quality is the a buzzword and everybody talks about quality everywhere. Nevertheless, few understand the true meaning of the word quality and more are still unable and willing to put quality in its true perspective. Because of the importance of quality in health care services, the researcher highlights quality conception and dimensions.

2.5.2 Definition of Quality

In 1931,quality was first studied as an industrial process by Shewhart's. Concepts include classifying the customer needs, decreasing products defects, and minimizing inspections. Influenced by Shewhart's (1999), Edward Deming, who is considered the father of quality, recognizes quality as a primary driver for industrial success by matching the current needs with future needs.

Japanese engineers and executives introduced these methods inthe Second World War. Quality is the “fitness for use” (Juran, 1974). There are some major differences between services and goods. The nature of services is intangibility whereas goods are tangible. Measurement of service quality can be more complicated as a result. (Yarimoglu, 2014).

2.5.3 Service Quality

Service quality has been increasingly recognized as a main factor in distinguishing between services and structure of competitive advantage. Moreover, service quality is defined as the degree of inconsistency between customers' expectations for service and their perceptions of service performance (Parasuraman et al., 1985). Yarimoglu1(2014) claims that service quality measures how much of the service meets the customers' expectations.

Sweeney et al.(1997) analyzes whether quality in service affects value and consumer readiness to buy.

Quality of service parameters were also examined considering their impact on trip choices (Glerum et al., 2011) and usually focuses on users' perceptions and performance assessment. Being an essential aspect for companies differentiation, service quality has always represented for marketers as a point of strong debate and interest.

Nowadays, clients are aware of their services and don't accept inefficient or unpleasant services due to the fact they benefit better from better services which trigger their growing expectations (Munthiu andVelicuet al.,2013).

Seemingly, healthcare services have unique features and occupy important position among other services due to its nature that involves risks (Edura, Rashid andJusoff,2009).

2.5.4 Features of Services

Services have four unique features that have an impact on marketing plans. These features include:

- Intangibility: It means that the customer services are not materials and cannot be touched. Such a feature may reduce customer trust.
- Inseparability: Services is a separate process from production. Contrariwise, goods production process, storage and distribution are not separated.
- Heterogeneity: Services are always unique and never duplicate. They are not identical.
- Non-storing: Healthcare providers do not store the services (Gilaninia, 2012).

2.5.5 Quality Cost

Given the highly competitive nature of markets today, companies must provide high quality products or services to survive. In today's markets, quality has become a crucial competitive factor to gain processes excellence. It is essential to have a high level of processes quality, but sometimes quality costs are expensive. Here are forms of costs:

- Prevention Cost: It's the cost of how to plan, document, control and train man power .
- Appraisal Cost: It's the cost of inspection, tests, fitting, standardization, depreciation reports and non-accepted products.
- Internal Failure: It is the cost of junk, repair, rework, damage, defect, failure, and re-inspection.
- External Failure Cost: It's the cost of customer complaints, goodwill, failures, services and replacement, reputation and insurance ,compensation ,second sales. This cost comes from product point view(Zaklouta, 2011).

In health sector, the cost some times differ from manufacturing sector as patients are the customer, and quality costing is more challenging due to the complexity of the processes and the fact that such processes contain a lot of which intangible and hidden costs.

Kabir and Carlsson (2010) introduce that service quality is essential to gain client satisfaction and should be connected to customer perceptions and customer expectations. Oliver (1997) argues that service quality can be defined as a comparison between customers' expectations about the service. Companies build their quality concepts on customers' perceptions about the service (Kabiret al.,2012).

2.5.6 Importance of Service Quality

Zeithaml and Bitner(2013) state that high quality service is not just the work of customers' and purchasing departments, but also all levels of management and staffs need to have an ample understanding of customer care. Maintaining quality is a critical issue for small enterprises that helps maintain customers' satisfaction and trust as well as reducing risk and cost of repairing damaged good (Linton, 2009).

Quality means the degree of defect-free of products measured against other things of a similar kind of services. The Institute of Medicine (IOM) has defined the quality of health care as how far the products provides health benefits for individuals. Quality health services should provide desired health outcome and should be harmonious with current professional knowledge(Gupta and Rokade, 2016).

As Patients have become more aware of their right in health services, organizations should maintain good standard of quality to meet customer expectations, reputation, meeting standards by using different tools to measure quality all the time.

2.5.7 Benefits of Quality

According to the International Standard ISO 2000:9000, quality is defined as "the degree to which a set of inherent characteristics fulfills requirements. As much as the organization keeps high levels of these standard, it will be distinguished. Therefore, it is important to see some point of quality benefits:

- Increasing the strengthened points of competitive advantage.
- Increase the power of adaptations to changing market conditions and to environmental and other government regulations.
- Improving high productivity.
- Making the market image more better .
- Removing faults and waste.
- Reducing costs and lost.
- Improving revenue .
- Enhancing client loyalty and gratification.
- Increasing job security.

Quality measurement in health care is the process of using data to evaluate the performance of health plans and health care providers against recognized quality standards. Thus, it is very the important to measure quality continuously for the following reasons:

- Preventing the overuse, underuse, and misuse of health care services.

- Identify non-value adding process.
- Ensuring patients safety.
- Using accountability for providing high-quality care.

2.5.8 Dimension of Service Quality

Arlen Chris(2008) identifies dimensions of service quality after massive researches have been done. Zeithaml, Parasuraman and Berry(2013) clarify five dimensions customers use when assessing service quality. They call their survey instrument SERVQUAL. However, all dimensions are important to customers, but some more than others based on SERVQUAL. This tool measures five dimensions of service quality: tangibility, reliability, assurance, responsiveness, and empathy. The SERVQUAL instrument, in its original form, contains twenty-two pairs of Likert scale statements structured around five service quality dimensions. These dimensions, according to (Peprah and Atarah ,2014)andYarimoglu (2014) are:

- Tangibility: means the presence of physical facilities, personnel ,equipment and the available resources.
- Reliability: deals with the organization ability to commit to their promises to customers and employees to create confidence.
- Responsiveness: reflects the willingness to provide customers service immediately and the respond quickly.
- Assurance: illustrates how employees deal customer with elegance, great confidence and credibility.
- Empathy: is to give the suitable service to customers at the right time.

Whereas quality has many dimensions, all of them are important, but the mostly used are those mentioned in SERVQUAL to assess quality service to bridge the gap between customer perception and expectations.

2.5.9 Health Care Services Quality

The US Agency for Healthcare Research and Quality identifies health care quality as "doing the right thing, at the right time, in the right way, for the right person, and having the best possible results". Miller (2015) indicates that quality improvement in

health care is considered a chain of regular and continuous activities leading to measureable quality (Health Resources and Services Administration, 2011).

There most six guiding aspects of health care are: safety, effectiveness, patient centeredness, timeliness, efficiency, and quality (clinical quality, patient centered, efficiency) (Scott, Sivey and Ouakrim et al., 2011). Service quality strategy is a collection of principles that provide directions for everyone in the organization.These principles should be carefully linked to distinguish the organization from other (Samea and Shahin, 2010).

Quality service in health care industry must be a preference for any health care system. The view of quality becomes more vital and strong in health sectors because of the rising costs of treatments, restricted resources and evidence of discrepancies in clinical practice (Campbell et al., 2000).

Healthcare services have unique features differ from products because it is difficult to measure quality in health care. Distinct healthcare industry has special characteristics such as intangibility, complexity of service, amazing advances in technology, and it is frequently threatened by abuse ,inadequacies, errors, resource restrictions(WHO, 2006).

Thus, we see nowadays health care industries are considered complex active systems. The main focus is on improving quality of care and meeting tough procedures, so quality improvement activities should mainly concentrate on improvements in medical outcomes, satisfaction, and efficiency (Taner ,Sezen & Antony, 2007).

2.6 Health Care

2.6.1 Introduction

In 1978, WHO clarifies all recipients of health care service understand health care and acknowledge the role of health care providers from various disciplines. Health care is directed by principles of access, equity, essentiality, appropriate technology, collaboration, and community involvement and agreement (MacLean, Stolarz, et al,2004), The Alma-Ata Conference mobilized a " Health Care movement" of experts, institutions, governments and civil society organizations(WHO, 2009).

Different components of health care recognize a conceptual model which refers to both ways and opinions about the ways in which health care is practiced including primary care, prevention of disease, health promotion, mental health, and community development. Health care aims to provide essential community-focused health care (Shoultz and Hatcher, 1997)and (WHO, 1978).

The World Health Organization (2000) defines health system as all activities whose mainly purpose is to encourage, restore, and preserve health". (The World Bank Strategy for HNP Results, 2007). Bhattacharyya, Zakusand(2009) mentions that the core objective of all activities carried out by health organizations is to motivate, reinstate or preserve health. They also mention some purpose of health care such as: improving health of the population they serve, responding to people's expectations, providing financial defense against the costs of health.

Physiotherapy is a part of health care at UNRWA, the researcher highlights Physiotherapy quality service at UNRWA Health Care centers from both employees' and patients perspective because of its vital roles in restoring function and maintaining normal daily activity.

2.7 UNRWA

2.7.1 Definition of UNRWA:

UNRWA is considered the biggest agency of the United Nations hiring over 30,000 staff, "99%" of which are locally employed Palestinians. UNRWA has shared headquarters between the Gaza Strip and Amman. The United Nations Relief and Works Agency for Palestine Refugees (UNRWA) is totally funded by voluntary donations from UN Member States. UNRWA also gets some funding from the Consistent Budget of the United Nations, which is used mostly for international staffing costs. The Agency's services include education, primary health care, mental and social services, camps infrastructure and progression, microfinance and emergency assistance in times of armed clashes (UNRWA, human resource, 2017).

2.7.2 Establishment

As a result of the 1948 Arab-Israeli conflict, UNRWA was settled by United Nations General Assembly Resolution 302 (IV) of 8th December 1949 to bring out direct relief and works programs for Palestine refugees and had started operations on 1st May 1950. Due to absence of a solution to the Palestine refugee dilemma, the General Assembly has repeatedly renewed UNRWA's mandate, most recently, extending it until now (UNRWA human resource, 2016).

2.7.3 UNRWA Services

Based on UNRWA Human resource (2016), UNRWA services are found at all areas which were occupied by the Israeli occupation and delivered to refugees who are registered with the Agency and need assistance. When the Agency began operations in 1950, it was responding to the needs of about 750,000 Palestine refugees. Today, some five million Palestine refugees are eligible for UNRWA services differ from one sector to another as: primary health care, education, social services and others.

Physiotherapy is part of health care service provided by UNRWA for29 years to promote health and help disabled people.

2.8 Physiotherapy

2.8.1 Introduction:

Physical therapy is considered a branch of medical services that helps individuals improve, maintain, and restore maximum mobility and functional capacity at all stages of life. This contains giving that services in situations where movement and function are disappearing by ageing, injury, disease or environmental factors. Functional movement is central to what it means to be healthy (World confederation of physiotherapy, 2007). Physical Therapy (PT) is also known as Physiotherapy was presented in the United States following (WWI, 1914) to re-establish soldiers at post war era. Physiotherapy has grown-up to embrace many subspecialties such as orthopedics, hand injuries, chronic pain conditions, industrial rehabilitation for injured workers, as well as, those recovering from injury, surgery, or physical special needs from illness. Physical Therapy is the

science of treating handicapped people with special needs (or those who may develop physical disabilities) to help them maximize and maintain basic functional abilities (e.g., sitting, standing, walking) and to avoid difficulties. This is accomplished through training for daily activities and treatment of both physical therapy and occupational therapy in using different techniques of existing treatments (Nancy Carney, RN, 2004).

2.8.2 Roles of a physiotherapist

Physical therapists (PTs) are the professionals who treat patients of all ages, from newborns to the very oldest who have medical problems or other health-related conditions that limit motion to reach functional activities in their daily lives.

PTs evaluate each case and establish a plan using treatment techniques to promote the ability to transfer, relief pain, restore function, and forbid disability. In addition, PTs work with individuals to avoid the loss of motion before it occurs by evolving fitness- and wellness-oriented programs for healthier and more active lifestyles.

Physical therapy can be delivered for people in different locations including hospitals, private clinics, outpatient clinics, homes, schools, sports and fitness facilities, work settings, and nursing centers. State licensure is required in each state in which a physical therapist practices (American physiotherapy association) APTA. Physiotherapy is a specialized, highly reliable and natural medical treatment. Its important rehabilitation techniques include exercises manipulation, massage, skills training and electrical treatment. All these are used to:

- Evaluating patients' disorders or functional disability.
- Detecting problems and determining the correct treatment.
- Using a variety of treatments to reduce pain and improve movement.
- Choosing suitable exercises for patients to increase their strength and ability.
- Managing health education programs when needed.
- Rehabilitating people who suffer from strokes and accidents.
- Educating caregivers and family about the patient's physiotherapy program.

2.8.3 Role of Physiotherapy in Health Care

Physiotherapists are regulated health professionals whose practices include health promotion and disease prevention. Physiotherapists work in primary health care teams maximize mobility in response to the needs of patients across the lifespan. They also help ensure continuity of care for patients and their families across the care continuum. Physiotherapists in primary health care facilitate diagnosis, treatment and management of a variety of acute and chronic conditions, promote physical activity, and increase mobility and function (Canadian physiotherapy, 2012).

2.8.4 Educational criteria for physical therapy provider

Firstly, according to this code, physiotherapy is classified into a separate entity and not clubbed with paramedical services .World Health Organization (WHO) has recently classified physiotherapy as an independent practice out of Paramedical(Kumar Sameer). Definition of physiotherapist differ from state to state, from country to country, and among various levels of professional responsibility. Most U.S. states have two main categories of physical therapy providers both physical therapists (PT) and physical therapist assistants (PTA) and other classifications like physical therapy technicians (PT Techs) or aides. Most countries have licensing bodies that require physical therapists to be a member of before they can start practicing as independent professionals. The Canadian Physiotherapy Association (CPA) offers leadership and representation for physiotherapists, physiotherapist assistants and the physiotherapy profession in Canada (Canadian Physiotherapy Association,2012).

2.8.5 Physiotherapy in UNRWA

Physiotherapy services are provided in both West Bank and Gaza Strip through 18 physiotherapy units (11 in Gaza, 6 in the West Bank and 1 in Jordan). In the West Bank, there are 21 staff members (11 regular employees and 10 recruited under emergency),and in Gaza there are 49 staff members vary between permanent and Job creations employees. UNRWA has strengthened the cooperation between physiotherapists and school supervisors creating partnerships between UNRWA

physiotherapy units and non-governmental organizations throughout launching a preventive physiotherapy program for feet examination; screening first-grade school children for postural deformities, distributing or loaning assistive devices (wheelchairs, crutches and walkers) to persons with disability, and cooperating with the local committees for people with disability (UNRWA .health department, 2017).

The project was established in 1988 by the (UNCIEF) to provide services to patients who were attacked by Israeli occupation. Now, it delivers services to all cases need physiotherapy of all ages from Palestinian refugees. All of the eleventh clinics among Gaza strip introduce physiotherapy services and accept all ages and cases referred from specialists. Every patient has a chart having detailed information about the case; then the physiotherapist put the physiotherapy treatment plan. Different cases need different number of sessions, discharge processes, and follow up (Physiotherapy division, health department ,2017).

2.9 Conclusion

This chapter firstly has introduced lean thinking and its history, principles and nowadays lean concept. Besides, it has presented the challenges of applying lean in services sectors. Moreover, the researcher has introduced an overview of Six Sigma and its evolution and methodology. After that, Lean Six Sigma has been fully studied as well as quality is services as two main variables of the study. Finally, the concepts of healthcare, UNRWA and Physiotherapy have been discussed in general to illustrate study variables.

Chapter 3
Previous Studies

Chapter 3

Previous Studies

3.1 Introduction

Scientific research always comes in the context of the search for answers to the research questions .So literature review was necessary for the researcher to seek for previous studies, literature and references, where the importance of giving the researcher a full and comprehensive knowledge of the subjects of interest. Many of papers and studies have been conducted to lean, six sigma and quality in manufacturing sector ,as they are considered approaches transfer to Health industry .The researcher will display some of these studies that handle with this subject. Firstly the Palestinian previous studies:

3.2 Previous Studies

3.2.1 Palestinian Studies

1-(Abu Eida, Daraweesh& Eda, 2015) "Job Satisfaction and Its Impact on The Quality of Health Service in the government Hospitals operating in the Southern part of the West Bank".Palestine

This study aims to assess the quality of health service in government hospitals operating in the southern part of the West Bank.

A descriptive analysis approach was used in this study .To attain this purpose questionnaire composed of two dimensions was design to collect data. The researcher used a stratified random sample of male and female employees and (130) questionnaires were distributed. SPSS program used statistically to treat data.

The conclusion of study was: There is a direct relation between job satisfaction and the quality of health service whenever there was a satisfaction for the work, it reflected positively on the quality of health Service.

Finally, the recommendation of the administration of government hospitals must take care of job satisfaction among workers in order to provide appropriate working conditions to gain employee's satisfaction, It also recommended that the necessity of

focusing on the existing staff who works in the in front of the public service, because they are in direct contact with the public.

2- (El Qassas, 2013)" Using Six Sigma Approach to Rationalize Taking Investment decisions ".An Empirical Study on the Palestinian Commercial Bank-Gaza Strip.

This study aims to clarify the use of approach Six sigma(SS) to streamline decision making investment in Palestinian commercial banks (bank of Palestine, Palestine Islamic bank, commercial bank of Palestine, Palestine investment bank ,al quads bank, nation bank of Rafah).

The researcher used descriptive analyses approach. (167) employees who have job specification (Finance Manager, Branch Manager, Financial Analyst, Internal Auditor) representative the study population. Questionnaire was used to collect data and the sample has been chosen randomly.(70) questionnaire were distributed. (60) Questionnaire was received after distribution. The rate of return was (86%). SPSS was used to analyses data.

The study concluded the following finding: the commercial banks used six sigma with varying degree of slandered.

The Final conclusions were: namely(market value to book, trading volume turn over) also the study concluded that senior management support applying Six Sigma in the commercial banks. As the process is not obvious in the rate of (70%), the senior management doesn't share the worker in decision making process at rate (73%).

Recommendations of study: Need to pay attention to apply Six Sigma in the commercial banks because of its benefits, and that is through reduce cost ,improve quality and share employee in decision making process.

3-(Salman, 2013) "The level of quality of university services as perceived by students of Al - Aqsa University in Gaza according to the quality of service".

This study aims to measure the quality level of the university services as it is conceptualized by Al Aqsa University students' in Gaza based on the service performance.

The researcher conducted a measure concerning the service quality (ServPerf). It consisted of six domains contained (40) items. The sample of the study was (380) male

and female students from Al Aqsa University in Gaza. The results were analyzed by SPSS.

The study findings revealed the following: the quality level of the university services, as it is recognized by Al Aqsa University students, was low and medium in all the domains**.** Also here are statistical significant differences attributed to the gender variable in favor of the females in all the variables except security domain. There are no statistical differences at (α =0.05) in the recognized university services based on the educational level variable (first level- fourth level).

The study came up with some recommendations**:** It is necessary to improve the level of the university services which are presented to Al Aqsa university students in

All the domains. In addition, there should be a hard work to satisfy the students about the performance quality which is presented to the students through confirming the university privacy.

4-(Zoarb, 2012)" Using of Six Sigma to Save the Quality Cost in Listed Companies of Service Sector in Palestine Exchange": (Applied Study)

This study aims to highlight the role of Six Sigma in saving the quality cost in listed companies of Service Sector in Palestine Exchange(PEX).

To achieve the objectives of this study a special questionnaire was designed, considered as a basis for the field study conducted on the Study sample. Number of (36) questionnaires were distributed out of which (31) were returned which represents a percentage of (86%) of the distributed of Questionnaires.

The study findings were: the companies were listed of Service Sector in Palestine Exchange has the basic requirement to apply the Six Sigma in various manners. In addition, applying (SS) will contributes and allows the entities to improve the quality of services and saving the cost of services.

The researcher introduced a number of recommendations and suggestions including the necessity to spread out the theoretical and practices culture of the Total Quality Management and the importance of adoption of the (SS) based on a clear scientific methodology.

5- (Abdulla, 2012) "Compliance with Six Sigma Methodology in Controlling Internal Auditing Quality". An Empirical Study on the banks operating in the Gaza Strip.

This study aims to identify the extent of the Compliance with Six Sigma (SS) Methodology in Controlling Internal Auditing Quality in banks operating in the Gaza Strip.

Data was collected through distributing questionnaire to a sample(45) of the staff sections of the Internal audit and quality in banks operating in the Gaza Strip. Descriptive analytical method was used to study the content.

The most important results of the study were the following: Is committed to banks operating in the Gaza Strip, the standards of Six Sigma (the senior leadership support, feedback and measurement, continuous improvement, processes and systems, human resources) significantly and committed to banks operating in the Gaza Strip, the standards of Internal Audit (professional competence, handling the activities of internal audit work, arrangement and implementation of the internal audit process) very much.

The study came up with some recommendations including: Attention to (SS) approach application ,focus on the probability of its usage in banks regarding the scientific effect in reducing errors and improving the quality of services provided, which are corresponding with the expectations of customers, which is reflected on the quality of internal audit.

6-(Jawada, 2011)" Feasibility of Application of Six Sigma and its role in improving the quality of health services In the Government Hospitals In Gaza Strip." From The perspective Of Senior management

This study aims to explore (SS) role in enhance the quality of health services and determine the feasibility of application of (SS) in government hospitals in Gaza Strip from the top management' perspective by identifying the availability of key factors as: administrative, technical, financial and human resources factors, that contribute to successful implementation of(SS).A questionnaire was designed to collect data from the target group that includes all senior management in the government hospitals, (207) questionnaire forms were distributed and the returning ratio was (86.5%).

The study results were found to provide the prerequisites for applying Six sigma such as administrative, human and technical requirements, and the confirmation of senior management that the excellence in the patient service is one of the most important of their objectives and their readiness to support the application of (SS).

The study concluded that there is an approval from the senior management that, the application of (SS) has an impact on refining the quality of health services.

The recommendations of study were: The need to increase the ability of the necessary prerequisites for the application of (SS). An attention must be found to the concept of six sigma and attempt to educate hospital staff with six sigma concepts and emphasize the importance of applying (SS).

3.2.2 Arabic Studies

1. **(Basher, 2017) "Application of total quality management and its impact on quality service". Produced by Torapy hospital . Algeria.**

This study aims to identify the staff' viewpoint of the availability of the Total quality principles management in the Algerian public health organizations, and their impact on the quality health services provided at the hospital.

Descriptive analyses approach was used, with study population all employees (473). And all patients were attended from 1/5/2015-1/6/2015about (808). For this study Questionnaire was used to collect data.

The study came up with the following major conclusions: An awareness among members of the study sample towards the importance of applying total quality management in the hospital, the quality level of service Provided is not unacceptable for hygiene, a lack of modern equipment, the slowdown and the delay in providing the service, and an existing impact of the availability of the total quality principles management on the quality of provided health service management.

The study came with some recommendations: The need for the public health sector manager to be convinced of the importance of TQM as a strategic choice in quality management .Training the managers of health institutions on how to apply And follow-up and continuous improvement of total quality programs .And Educate and train employees on the implementation of TQM programs continuously.

2-(Aburahmeh&Magboul et al.,2016)Physicians, Nurses and social workers perceptions of the impact of application accreditation standards on quality of health services in Mecca region hospitals Saudi Arabia.

This study aims to investigate the Physicians, Nurses and social workers perceptions of the impact of accreditation on quality of health services in Mecca region hospitals Saudi Arabia. To attain this objective the researcher has used the Descriptive Statistics analyses. The study targeted two hospitals. Stratified sample was use to select study samples of the two hospitals.

The research relies on survey accreditation instruments tool was used to conduct study sample .SPSS statistical analysis software has also been used for this study, questionnaire was used to collect data of total No.(400) .the received questionnaire (370) of return rate 92.5%.

The main results have shown that receiving health accreditation leads to the improvement of the quality of the provided healthcare services, also there is a need to assess quality based on patient perceptions.

The recommendations of the study :Health accreditation committees were recommended to focus on the results of the performance indicators and to have the results in turn .In order to suspend or withdraw the creditworthiness of the facility.

3- (Arafeh,2016) Leveraging Six Sigma Tools and Methodology to Improve Student English Language Performance at Elementary School. Jordan

This study aims to clarify the Six Sigma (SS) methodology in improving the act of students in English as a second language and increase the teaching process by using quality tools in an educational environment.

The study selected altered quality improvement tools within the "Define, Measure, Analyze, Improve, Control" (DMAIC) phases to improve student performance in an English language classes at a private primary school, involving the first three grades with (27) classrooms and a total of (697) student.

An English Language Intensive Program (ELIP)school has started, and students who acts unwell are stimulated to join in the program. Data was collected through observations, interviews, by using two surveys, one for parents and one for teachers.

Conclusions of study were: Different quality tools, such as cause and effect diagram have been successfully useful within (SS) DMAIC framework in the educational sector to increase the performance of students and enhance the teaching process. This project delivered a good platform for introducing the (SS) DMAIC methodology and tools to improve performance and problems solving in dissimilar units in the school. The forms and documents resulting from this project provided a good knowledge base for the several units to manage their teaching processes.

4-(Rezek, 2016) the possibility of implementing the Six Sigma approach and its role in developing the manufacturing strategy. Exploratory Study at the Bahbouh Cement Products Factory. Syria

This study aims to demonstrate the feasibility of implementing a (SS) approach at the Bahbouh Cement Products Factory and to demonstrate the impact of this approach on the manufacturing strategy in terms of cost, differentiation, development and innovation in order to develop an integrated work plan for the plant.

To enable its competitive position compared to its rivals. Case study was used to accomplish the research.

The study targeted Bahbouh cement Factory in Syria.An empirical study on the factory was done that means all the employees was included. Questionnaire was used to collect data.

The final conclusion of study: there is an effect of implementation (SS) approach in the manufacturing strategy.

5-(Albahi, 2016) "The Impact of Electronic Banking Services Quality on Customers' Satisfaction". An Empirical Study on Jordanian Islamic Bank in Amman – Jordan

This study aims to investigate the effect of the quality of E-banking services including dimensions (ease of use, save of time, privacy, security) on customers satisfaction. The population of the study consisted of the Jordanian Islamic Bank customers in Amman city. The target sample was the costumer of Islamic bank (340) respondents. To attain the objectives of the study, the researcher developed an

instrument a questionnaire to collect data. The number of valid and analyzed questionnaires was (232)from (283).And the response rate was (81.97%).

The study concluded with a number of results:

The level of E-Banking services quality in the Jordanian Islamic Bank in Amman city and its branches according to the study sample was high. An impact of statistical significance of the quality of E-banking services including dimensions (ease of use, save of time, privacy, security) on customers' satisfaction of Jordanian Islamic Bank exists ($\alpha \geq 0.05$).

The recommendations of this study: to maintain that high level and monitoring it from time to time. It is necessary for the bank to carry a periodic study to measure the effectiveness of E-banking services and secure customer's satisfaction maintaining them especially that the expectation and experience of customers differ from one to another.

6- (El Udily, 2014) "The ability of the Six Sigma method and its role in reducing costs and enhancing competitiveness manufacture of consumables" Jordan.

This study aims to demonstrate the role of Six Sigma in reducing the percentage of defects and maximizing profits by recognized applicability of the methodology of this method, and to what extent its standards affect in reducing costs, and increasing competitiveness.

Case study has been used for a Jordanian industrial company, It is an advanced technology company for recycling consumables. The study population consists of all employees of the Ministry of Finance for Budget and Organization Affairs in Riyadh from the fourth to the fourteenth rank of (441) employees. The study sample consisted of (411) employees randomly selected. Data was collected by a questionnaire.

The results of this study :The target company didn’t apply six sigma methodology Also it does not have the elements of applying (SS) approach and its requirements but if it apply (SS) approach, the Sigma level will rise from 3.1to 3.9 also Defective production will decrease from one (11.5)to(3.5)and its profit increase to(61825.12) dinar.

Recommendations of this study: Adopting a methodology six Sigma, work to change the organizational culture, training all managerial levels in the company And the application of this approach because of its positive on the company under study.

7- (Al Manaseer,2014)."The effect of using Six Sigma standards in development the manufacturing strategy". An Empirical Study on cement products in ready- mix concrete factories in Manaseer Group in Jordan

This study aims to examine the effect of using (SS) standards in evolutionof the manufacturing strategy in Jordanian manufacturing organizations, mainly in cement products in ready- mix concrete factories in Manaseer group in Jordan.

The study population consisted of Jordanian manufacturing Sector in Jordan. The study sample included ready-mix concrete factories in Manaseer group in Jordan. The unit of sampling and analysis included all administrative employees in ready mix concrete factories in Manaseer group.

The study follows a descriptive analytical to accomplish this study . A questionnaire was used to collect data.

Results of the study were: there was a significant relationship between applying six sigma and development of manufacturing strategy at level (0.05). Also, there was a significant relationship between applying six sigma and development of cost leadership strategy at ($\alpha \leq 0.05$). Furthermore, there was a significant relationship between applying six sigma and development of creativity strategy at level (α 0.05). Moreover, there was a significant relationship between applying six sigma and development of differentiation strategy at level ($\alpha \leq 0.05$).

The study recommended that it is important to apply six sigma in manufacturing Organizations in order to develop manufacturing strategy in terms of decrease the cost, and achieving differentiation and creativity.

8- (Sabry, 2014) "Factors critical to the success of Six-Sigma quality program and their influence on performance indicators in some of Lebanese Hospitals". Lebanon.

This study aims to explore the realities of critical factors (CSFs) to the success of a (SS) some of Lebanese hospitals in Beirut. The study targets the private hospitals, the

sample for this study is randomly was chosen. That consists of five hospitals (Trade Hospital, AUH Hospital, NajjarHospital, Clemencue Hospital, and Makassed Hospital) and representing 29.4% from the total number of the hospitals in Beirut City.

A questionnaire was used to collect data to examine the relationship between the factors of the hospital's quality program and performance. Two questionnaires were used; Correlations were used to analyze the data collected from a sample of (101) respondents. The results showed that five CSFs (closer customer relationship),(measurement), (organizational structures).

Conclusion of study was: the literature reviews still debate on the application of CSFs of six-sigma quality program in the healthcare sector and didn't agree on a universal complete uniform construct to measure the performance in this sector.

9-(Eshawi,2014) "Six sigma Method, the most technique to achieve Total Quality Management" (TQM)2014.Algeria

This study aims to discuss presenting the six sigma methodology and the most important statistical tools along with their applications to achieve the needed precision.

This study is trying to measure the level, in educational services related to the results of the preparatory certificate for one courses in recent years. Number of students was approximately one million.

The Conclusion of study was : The evolution of the concept of quality and the crystallization of his ideas to the concept of TQM did not come at once but rather took time. Six sigma methodology focuses on customer improve quality needs requirement achieve for this purpose.

The study came with some recommendations: on an Academic level the need to pay attention to teaching techniques in Algerian universities and institutes. At the professional level: The need to introduce the uses and advantages of applying these techniques in the Algerian economic institutions by Ministry of Industry and Restructuring in cooperation with universities and specialized institutes in this field.

10-(Suleiman, 2013) "Basic dimension of the (SERVQUAL MODEL) and its Impact on the level of customer satisfaction". An Empirical study of the Housing Bank IN KARAK, Jordan.

This study aims to clarify the influence of the basic dimensions of the SERVQUAL model on the level of customer satisfaction attending the Housing Bank.

Descriptive analytical research was follow to accomplish this study , a questionnaire was used for data collection. The target population consists of the four Housing Bank branches in KARAK governorate.

The study selected random sample from the target population consisting of (400) Housing Bank customers in KARAK equal numbers of questionnaires were distributed on the branches, (375) questionnaires were received, (375) questionnaires were valid for analysis or (92.3%) of the study sample.

Finding and conclusion: At different level, there is an impact of the basic dimensions on the SERVQUAL Model at customer satisfaction.

The study concluded some recommendations: The attention to supply services to customers upon its request and without delay, and held preparation courses to develop the performance of workers. Ensure that there is a level of confidentiality of information and the need to strengthen customers' confidence in the Bank. Also care of the opinions of customers, their requirements and obstacles they may face to reach a higher level of quality.

11-(Bouguedjani and Al Dmour,2012)The impact of the medical services quality on patients' loyalty in Jordan university hospital". (Case study).Jordan

This study aims to analyze the influence of medical services quality on the extent of patient's loyalty in "Jordan University hospital" (JUH).

To achieve this purpose, a questionnaire was developed to gather the required data A convey sample was taken from (2000) patient attend daily to hospital (231) one. The respond rate was (89.14 %) .

The main conclusions: The most important dimensions of medical services in (JUH) according to SERVQUAL scale are: tangibility, responsiveness, reliability, assurance and empathy. There was no statistically significant difference between the

medical services quality and patient's loyalty according to gender variable when using SERVQUAL scale measurements.

The gap differs with the difference of patient's loyalty level (weak, medium and high) when using SERVQUAL questionnaire.

Recommendations were to create modern marketing tools and techniques when dealing with hospital patients, these approaches take into consideration patient's perspective in order to develop medical services provided by Jordan University hospital.

12-(El Sharify ,2012)" Six sigma input for the distinct value of the customer". An Exploratory study of the views of a sample of departmental and divisional managers at the Cement Lab" –EL-KUFA. Iraq.

This study aims to study the role of Six-Sigma application in achieving the customer's value in the productive organizations. The researcher depended, on terms of the theoretical part, of what is available of Arabic and foreign books in the libraries as well as researches and the internet.

An exploratory study of the opinion of a sample of departments' an branches' managers in Al-KUFA cement factory which was chosen to conduct the study of a (37) individual sample.. SPSS program was chosen to analyze data which has been collected.

The conclusion of study was: The factory management encourages and supports the achievement of quality in all its departments. The factory management does not have a broad knowledge of the (SS) methodology .also takes consideration the feedback from customer. The study conducted that the factory has the suitable infrastructure of Computers and software Programs to support (SS) implementation.

The recommendations of study were : Attention to six sigma approach application and the emphasis on the possibility of its use in banks because of its importance in terms of scientific and that reducing errors and improving the quality of services provided, which are commensurate with the expectations of customers, and reflect on the quality of internal audit. The commitment and support of the leadership of the banks to work six sigma approaches contributes to planning for all audits and risk assessment.

13-(Noor, El- naaemy& El-Rawy2012)."Using Six Sigma Methodology in Controlling Internal Auditing Quality in hospitals Award Winning quality and excellence" Amman Capital.

This study aims toidentify the Practice of the Six Sigma Methodology in Controlling Internal Auditing Quality in hospitals Award Winning quality and excellence in Amman Capital.

A questionnaire was planned consisting of (67) paragraphs to data from study sample which consisted (67) individuals.

The finding and conclusions of this study were :There is a significant effect to Six Sigma Criteria (Commitment and support of top leadership; feedback and measurement, continuous improvement, processes and systems and human resources) on quality of internal audit in private hospitals award-winning quality and excellence in the city of Amman at level (0.05).

The study concluded some recommendations: Attention to the concept of Six Sigma and settle the chance of use in hospitals because of its vital from the scientific by reducing medical errors and improve the quality of services provided, which are equal with the expectations of beneficiaries, and reflected in the quality of internal audit.

14-(Ramez, 2012)"Patients' Perception of Health Care Quality, Satisfaction and Behavioral Intention: An Empirical Study". Bahrain.

This study aims to evaluate the level of service quality of health care providers in Bahrain with a view to uncovering, primarily; the relationship between service quality dimensions and the overall patients' satisfaction and analyzing behavioral intention of patients.

The study population consist of hospital and health clinic patients attended during the second quarter of (2010) in Manama capital of Bahrain, the study sample was A convenience sampling (235) patients attendance there .whom 52.34% were male and 47.66% were female.

Data was collected by questionnaire . The study result shows that SERVPERF scale was more efficient than SERVQUAL scale in explaining the variance in service quality.

The conclusion of study was: The study findings support the hypothesis that performance scores can provide more reliable results than gap scores. The SERQUAL scale explains (62.75%) of the increasing discrepancy in the overall service quality, compared with (69.716%)by the SERVPERF scale.

3.2.3 Foreign Studies

1-(Eriksson, 2017) "Hospital management from a high reliability organizational change perspective". Swedish case study on Lean and Six Sigma.

This study aims to describe and analyze nurses' perceptions and evaluate healthcare developmental work after the introduction of Lean and Six Sigma and, how nurses aspire to maintain a" high reliability organization" (HRO).

The study population was two public hospitals in western Sweden .The target sample was of nursing have been worked there who are Specialist nurses have a master's degree in nursing (n=17) .

The collected data based on an in depth semi structured, as a loose structure of open ended questions. In fact the two studied hospitals are similar as organizations.

Finding of this study: The nurses perceived that Lean worked better than Six Sigma, because of its bottom-up approach, and its similarities with nurses' well-known work qualities. Nurses coordinate patients care, collaborate in teams and take leadership roles.

To maintain high reliability and to become quality developers, nurses need stable resources. Expert knowledge (top-down approach) without nurses' local knowledge (bottom-up approach) can lead to problems. Healthcare quality methods are standardized but must be used with flexibility.

Final conclusion was: The study uses theoretical concepts from HROs, which were developed for unexpected events, to explain the consequences of implementing Lean and Six Sigma in healthcare.

2-(Bucci,De Belivs, Marventano&Deleva et al., 2016)"Emergency Department crowding and hospital bed shortage: is Lean a smart answer?" A systematic review.. European Review for Medical and Pharmacological Sciences2016; 20: 4209-4219. USA , Australia, Canada, Sweden, and India.

This study aims to provide a synthesis of the current literature focused on how Lean Thinking Principles and tools can be applied in an emergency department(ED)to address overcrowding and hospital admissions. To achieve this objective an assessment were used to conduct research. Publications were reviewed for eligibility about 40 articles.

Discrepancies were resolved through discussion by all reviewers. the source of systemic review collected from (Pub Med, Scopus, CINAHL, EconL it, NHS Economic Business Sources Complete, Health Technology Assessment).

The research identified(40) articles: nine from Pub med, (24)from SCOPUS and (7)from the other mentioned databases the most study conducted at a single center, four studies were carried out in Teaching Hospitals, two studies were carried out in pediatric ED. (USA, Australia, Canada, Sweden, and India).

The result of study was: Nine out of the 40 studies were eligible for the review studies were eligible for the review, only one case reported worse results after Lean intervention implementation.

Conclusion: Though Lean Principals have been used in healthcare for many years conclusion of their effects could still not be drawn. Surely, human-centered approach, top management support, work standardization, resources allocation and adaptation to the local context seem to be crucial for success. Furthermore, higher quality studies are needed, to evaluate the true ability of Lean interventions to improve healthcare delivery.

3-(Lindskog ,Hemphäla,Eklund, etal., 2016) "Lean in healthcare: Engagement in development, job satisfaction or exhaustion?". Sweden.

This study aims to identify to what extent lean tools (visual follow-up boards, standardized work, 5S, and value stream mapping) promote working conditions for employee and managers in healthcare. A longitudinal quantitative study was targeted

population consisted of five hospitals in Sweden .Two university hospitalsconducted lean and one municipality applying lean tools.(n = 448) include 56 managers.

Qualitative data, based on semi-structured interviews through questionnaire was used to collect data. (Response rate of 65%) The majority of the respondents were women (86.2%) and a total of 59.6% had a university degree.

The conclusion of study was: In the healthcare organizations that implemented lean, value stream mapping and 5Swork were not sustainable due to a lack of job resources in combination with a weak lean implementation process.

Results indicated that VSM and standardized work may be such enabling lean tools but only to a limited extent. Based on the results of this study, standardized work and VSM were considered central lean tools for employee and manager engagement in development and their job satisfaction, if also supported by other job resources.

4-(Gomes,Senna&Pinha et al., 2016)"Study on techniques and tools used in lean health care implementation" literature review.Morgantown, WV, EUA.

This study aims to review Lean performs and tools which are being provided to healthcare organizations. Systematic literature review from a survey conducted from SCOPUS database in order to know which are the most methods and for the implementation of Lean philosophy in healthcare .Content analysis consists of four steps systematic review was used. Gathering material, Descriptive analysis, Category selection, Material assessment.

The finding of the study: The study showed how varied of the use , implementation of Lean Healthcare tools and techniques. The target literature showed that the rate of studies, which have used one or two tools only, but also, showed other studies adopting a much larger number.

The conclusions: The study highlighted that there is a little of papers studying Lean, active and readable practices and tools applied to healthcare organizations. majority of these organizations, which have tried to implement some of the tools, still do not fully understand the trials and effort needed for Lean practices. We also hope this review can help new researchers, being a primary guide of what is already being published concerning the subject.

5-(Huddle ,Tirabass ,Turner&Lee, et al.AL, 2016)"Application of Lean Sigma to the Audiology Clinic at a Large Academic Center".

This study aims to clarify applying lean six sigma on quality improvement to decrease waste to improve audiology ,scheduling and deployment in a large tertiary care referral center

The study targeted academic tertiary center car .Targeted all patients attending audiology clinic from July 2013 to July 2014.

"Value stream mapping"(VMS) was performed for the audiology scheduling process, and wasteful steps were recognized for dismissal. Interferences included a 2-week block release, audiology template revision, and reduction of underutilized blocks. Overall,(2995) pre intervention and(3714) post intervention booked appointments were analyzed.

Conclusion of this study adds to a small but growing number of studies demonstrating that clinical operations can be streamlined through the application of Lean Sigma. In the era of ever decreasing reimbursements, maximization of efficiency will become paramount. Value stream mapping was successfully used to reduce convoluted scheduling practices. Lean Sigma is a valuable tool to improve clinic efficiency and reduce waste.

6-(Vesna& Branislav, 2016)"Employees factors importanceAs Predictor and response variables of lean Six Sigma concept". China.

This study aims to seek which employees' behavior dimensions can lead organization to better concepts integration and how Lean Six Sigma activity Contributes to employees' performance. The target population was companies in china.

Data was collected through survey questionnaire sent to (500) companies in Bombardier chain. The survey was distributed using e-mail, from private e-mail address. A total of (200) plants responded to the survey from (32) countries and six continents. The lean tools of this study were: 5S workplace organization methodology, Kanban, Poka-Yoke and DMAIC or DMADV, while employee's performances were described through five dimensions.

The conclusions : This is a potential suggestion in industrial practice expected in multinational production chains that are intended to apply Lean Six Sigma concept. Lean Six Sigma methodology application through DMAIC or DMADV, 5S and Kanban application will lately enable better employees' performance

Recommendations of this study: Deployment Lean Six Sigma in organization must take suitable care of its employees, since reward system as mechanism used to guide employees to share policy, vision and mission of the company, regular training is needed to all levels.

7-(Bhat, Gijo, & Jnanesh,2016)"Productivity and performance improvement in the medical records department of a hospital An application of Lean Six Sigma". India

This study aims to illustrate how (LSS) methodology was applied to a medical records department (MRD) of a hospital in India to decrease the Turn-Around-Time (TAT) of medical records training process and thus to improve the productivity and performance of the department.

A case study was used to accomplish (LSS) approach, improve the medical records preparation process. The case study was designed for a single case – the MRD of a single hospital of India.

A comprehensive literature review on LSS was carried out to identify the type of improvements carried out by different people in various hospitals to address process-related problems.

Conclusion of study: Lean and Six Sigma are mixed approaches in a systematic manner, for reducing the TAT of the preparation process of medical records. It helps to reduce healthcare costs and improve quality by eliminating waste from the processes. The study has shown a considerable reduction in TAT of the process, from (19) to 8min. The inventory went gone down to zero at the end of the day.

The cost benefit analysis by the finance department confirmed that the hospital save ($20,000) annually. Also the study found that correct management of human factors is essential .Also the project attained its goal due to the strong leadership of the top management.

8- (Jorma , Tiirinki, Turkki& Bloigu, 2016) "Lean thinking in finishing health care". Finland.

This study aims to evaluate how lean thinking usage for the first time in the public healthcare system of Finland as a development management system and what is the outcome has been achieved or expected by applying it is focusing on management, development patient and treatment process.

(webropol) survey was used in this study supporting by a mixed-method approach, a literature review was made in most common health care data bases .

A questionnaire was sent to(248)worker in public healthcare,(110)respond rate of response about(44.4%),public hospital primary healthcare centers. It's the first time to use lean thinking in the public sector of Fenland.

The final conclusion has shown that lean is mainly used as a development tool to seek financial savings and to improve the efficiency of patient processes but has not been implemented, the Lean initiatives have been positive and the methodology is quite well-known .because of that lean. The environment in finish health care is ready for the deeper implementation. It also highlights the expectations for Lean thinking in finish public HealthCare.

9- (Nayar , Ojha,Fetrick & Nguyen, 2016) "Applying Lean Six Sigma to improve medication management" . USA.

This study aims to evaluate submission with the Veterans Health Administration (VHA's) dual care policy. Data was gathered and define the current process for management of dual care veterans' medications and draft approvals to improve the current process for dual care medications management by applying (LSS) Methodology.

A surveys and direct observation were applied to gather data . Data was collected from several sources including: surveying care team members, site visit to the (VAMC) and a focus group with (VHA) patient care team members, direct observation

Conclusions: The findings will be valuable to VA providers and policy makers who seek to improve the service quality provided to dual care veterans and to healthcare managers who organized application of Lean Six Sigma techniques in their organizations to improve service quality. The Lean Six Sigma in general principles

applied in this project to develop recommendations to improve medication management for dual care veterans The project, therefore has a appreciated lesson for other VAMCs seeking to improve care for dual care of Veteran patients.

10-(Cavalheiro, Eid, Talerman1 et al, 2015)" Design of an instrument to measure the quality of care in Physical Therapy". Hospital Israelite Albert Einstein, São Paulo, SP, Brazil.

This study aims to design an instrument composed of fields that would validate physical therapy activities and generate a regular index to represent the quality of care in physical therapy. The researcher uses lean six sigma (LSS) approach to design the tool .This approach is arranged for problem-solving and continuous improvement of processes.

The most vital issues were linked to increase customer satisfaction productivity achievements, cost savings, increased profitability, and focus on reducing defects from the customer's perspective.

This instrument was specifically developed as a variation of the method known as "development of new products and processes" within (LSS) approach. The planning of the process relied on the brainstorming tool and the Cause & Effect Matrix The brainstorming involved an explanation of the items, for evaluation of the quality of care in physical therapy.

Conclusion of study: The instrument proposed enabled the assessment of several items related with the physical the service, allowing for customization, reproducibility and benchmarking among institutions. For management purposes, this five-requirement index demonstrates the quality ,training of professionals, the service results, the therapeutic planning and the structure of the physical therapy service. It produces an opportunity to classify improvement, as well as the strengths of the staff and the physical therapy service process.

11-(Mathew and Jagannathane, 2015)"Study Based on SERVQUAL Dimensions in Service Industry - A Literature Review ".India

This study aims to find out the methodology used in the journals related to IT. They are also interested to find out which dimensions of service quality have the greatest potential for improvement.

This paper is a review of few journals related to the use of SERVQUAL articles are closely reviewed related to service industry for the study. These journals are analyzed which are published during the years from 2009-2014.

The online database was used to clarify the articles published related to the aims of the study. The search in this database(Emerald) covered five quality management journals, three human resource journals, and four from information technology journals were used in the search.

The findings and conclusions: from literature would include deep analysis in service quality dimensions by categorizing the customer perceived service quality and information service quality. Measurement using SERVQUAL and its numerous studies are discussed in this paper.

12-(Bedi,moon,Bhatia et al2015)"Evaluation of Musculoskeletal Disorders in Dentists and Application of DMAIC Technique to Improve the Ergonomics at Dental Clinics and Meta-Analysis of Literature". India.

This study aims to assess musculoskeletal disorders (MSD) result in distress, pain and disease that can result in disturbance or impairment of dental practice by using (DMAIC)methodology.

To attain this objective a cross-sectional study consisting of 60 dentists was carried out to determine musculoskeletal work related pain in major cities of Northern India through two stages using questionnaire to gathering data. questionnaire based on the musculoskeletal pain were given over the last twelve months , improvement was carried out by recommending the subjects to implement ergonomics at their workplace using (DMAIC)methodology.

Conclusion: MSD was the cause of a major occupational health problem for dentists in India as well as worldwide and result discovered needs of workshops to

generate awareness of ergonomics as effective measures for reducing MSD among dentists.

13-(Bhat. Gijo , &Jnanesh 2014)"Application of Lean Six Sigma methodology in the registration process of a hospital". India

This study aims to review the scope of Lean Six Sigma (LSS) strategy and to discover its successful deployment in the Indian healthcare sector.

The researcher used a case study to apply the LSS DMAIC (Define-Measure-Analyze-Control) approach and its application in improving the registration process in the Health Information Department (HID) of a Medical College hospital in India.

Findings of this study were: Description of improvements in the HID through the power of LSS. Cycle time of the process was reduced from three to 1.5 minutes. The project conducted that a 94 per cent saving in patients' average waiting time. The study also reported a 91 per cent reduction in queue length and 48 per cent reduction in percentage of scheduled utilization of staff for the process.

The final conclusion was: This study clarified that how the application od (DNAIC) can develop the performance of the process and thus productivity in the department.

14-(Yarimoglu, 2014) "A Review on Dimensions of Service Quality Models" (Izmir/Turkey).

This study aims to focus on the service quality models measurement techniques, according to the review. Revision of literature of the existing service quality models in chronologic order. The dimensions of the models were examined and three main groups that consist of service quality dimensions. This study showed the common models from 1980-2000.This study focused on the service quality models. Themethodologyof this study was to review the existing service quality models in chronologic order.

The conclusion of This study was measuring the quality of service effectively requires understanding the nature of services. Services are distinguished from goods due to their natures and characteristics customers expect practitioners. Also it was show in this that to gain the optimal service quality that customers expect , practitioners should increase employee satisfaction and enhance interactions between employees and

customers (People element), design physical environment tools according to the target market customer expectations.

The most important finding in the literature that both gap based and perception based models have been implemented for assessing of service quality**.**

15-(Balushi ,Sohal ,Singh,Al Hajri,etal.,2014) "Readiness factors for lean implementation in healthcare settings – a literature review". Oman.

This study aims to define the readiness factors that are critical to the application and success of lean operating principles in healthcare organizations through a review of related literature.

The study selected a comprehensive literature review to conduct the study .a search of the peer-reviewed English language publications (up until January, 2012) relating to lean health, lean readiness.

Findings of study were :official readiness factors of Lean due to Leadership, organizational culture, communication, training, measurement, and reward systems during general change management and lean literature. Whereas, directly related to the successful implementation of lean in healthcare is that a setting is able to authorize a decentralized management style and undertake an end-to-end process view. These can be particularly difficult initiatives for complex organizations such as healthcare setting.

Conclusion of this study: To be known that this is the first paper that delivers a combined list of key lean readiness factors that can guide practice, as well as future theory and empirical research.

16-(Albliwi, Antony,Wiele& Lim,2014)."Critical failure factors of Lean Six Sigma: a systematic literature review". USA, India ,UK,2014.

This study aims to clarify the critical failure factors for LSS in different sectors, like manufacturing, services, higher education.

The research followed a systematic literature review of 56 papers that were published on Lean, Six Sigma and LSS in well-known academic databases from 1995 to 2013.

Findings of this study were : There are 34 common failure factors of LSS documented in this paper. These factors are deficiency of top management commitment

and involvement, absence of communication, shortage of training and education, limited resources and others. Many obstacles are discussed in this paper and need to be explored in future research.

The final conclusion: This study is considered one of the first systematic literature reviews to discover the critical failure factors of LSS and discuss the top failure factors from different angles, i.e. countries' evolution, organizations' size and industry nature. It was obvious that there is a lack of resources is a massive challenge for organizations, regardless of the evolution of the country or the size of the organization. Moreover, the massive gap in the literature that needs to be addressed in future research has been discussed in this paper, e.g. to recognize the CFFs of LSS deployment for countries at altered stages of evolution.

17-(Gharibi,Tabrizi,Oskouei et al.,2014) "Effective Interventions on Service Quality Improvementin a Physiotherapy Clinic". Iran.

This study aims to study and increase service quality of carried care in the Physiotherapy Clinic allied to the Tabriz University of Medical Sciences, Tabriz, Iran. The study conducted A quasi experimental interventional in the Physiotherapy Clinic, from 2010 to2011. A questionnaire was designed to collect data. The target sample was(324) patients were included . SPSS was used to analyze collected data collected .

Finding and results :Providers choice in the pre intervention phase, was six aspects of service quality containing of safety, prevention , early detection, dignity, autonomy and availability achieved non-acceptable scores. Following interventions, all aspects of the service quality improved and also total service quality score improved from 8.58 to 9.83 ($P<0.00$)

Conclusion: Implementation of Service quality can be improved by problem appropriate interventions. The acquired results can be used in health system fields to create respectful environments for healthcare customers.

18- (Chiarini, 2013)" Building a Six Sigma model for the Italian public healthcare sector using grounded theory" Italy .

This study aims to exist a suggestion of Six Sigma model for the Italian public healthcare sector and to link it with the manufacturing model. The study depended on ten values groups linked together using the 'story line' of grounded theory.

A qualitative approach was applied to case studies inside two Italian public hospitals. Interviews, a focus group and two observations have been done within two hospitals.

The results: Variances between Italian public healthcare and the manufacturing sector, a strong emphasis on patient satisfaction, improvements sometimes conducted without adding profit. Managers in European public healthcare organizations have to deal with politics if they want to reach strategic objectives through Six Sigma.

They organization should consider dissimilar organizational culture and many restraints in the manufacturing sector. Also deployment of Six Sigma inside the public healthcare industry the organization has to be handled as a whole and all the departments have to be connected.

19-(Burgess& Radnor,2013) "Evaluating Lean in healthcare".UK.

This study aims to exist out comes linking to how Lean is implemented in English hospitals National Health Service (NHS). Lean implementation in English hospitals was led by content analyzing .All annual reports and web sites over two time periods, giving a thorough analysis of Lean's status in English healthcare .

Content analyses was used to gather data depending on annual reports which considered the core data source .

Conclusion of research: The research classified different approaches to Lean implementation in English hospitals. Lean implementation continues to be common in English hospital trusts, also, its implementation has become general, hospital trust managers are implementing Lean in different ways in English hospital .Also gradually improve and raise Lean implementation approaches . Data pronounce a baseline for additional analysis so that Lean implementation can be tracked.

20-(Abuosi & Atinga, 2013) "Service quality in healthcare institutions: establishing the gaps for policy action". Ghana.

This study aims to pursue two key issues: to assess patients' hospital service quality perceptions and expectation using SERVQUAL, and clarify concepts used to evaluate patient perceptions. Data collected through questionnaire. The study targeted five public hospitals in one of Ghana's ten regions.

The targeted sample selected randomly of patient attending hospital admission department and follow-up records.

The findings illustrate the gap between patient expectations and perceptions during medical treatment.

The conclusion: Every rational customer expects to be treated with self-respect and elegance in any service organization.

Recommendations of study: patients do not get the medical treatment services they want. Therefore health managers can use these findings and recommendations to improve service delivery.

21-(Anbari&Tabaraie, 2013) "Measurement of Quality of Hospital Services via SERVQUA Model". Iran.

This study aims to regulate the different dimensions of the service quality in hospitals of Iran and evaluating the service quality from the patients' perspective. Study design was cross-sectional study. Random sample was selected from (385) patients from (3) general teaching hospitals in Arak, Iran. (SERVQUAL) valid questionnaire was planned to gather data.

The conclusion of this study was: established (SERVQUAL) is a useful instrument to screen and measure the quality of hospital services in a developing country.

The recommendation of the study: providing better physical services, cross training staff on patients' concerns, their need for better civil performance, from responsive personnel, providing a trustful climate across the hospital, paying individual attention to each patient.

22-(Lau, Cheung,& Lau et al., 2013)" Measuring Service Quality in the Banking Industry". A Hong Kong Based Study.

This study aims to find out the relations between service quality, customer satisfaction and customer loyalty in the retail banking sector in Hong Kong. study was based on a SERVQUAL model .

The population consists of a dissimilar population of the legal age, a sample of (119) retail banking customers was targeted from the Hong Kong and Shanghai Banking Corporation (HSBC) in Hong Kong. A pilot study using in-depth interviews was selected with (20) a customer of HSBC.A self-administered survey was conducted. The respondents were demographically diverse customers of HSBC retail banking services who reside in Hong Kong.

The results showed that the five SERVQUAL dimensions have a positive impact on customer satisfaction. Tangibility, responsibility, reliability and assurance were more significant in contributing to customer satisfaction, while empathy was the least significant.

The recommendations of study : Suggestions that SERVQUAL is a appropriate instrument for assessing service quality in the retail banking sectors in Hong Kong. Hence, banking.

23- (Hilton & Sohal,2012)" A conceptual model for the successful deployment of Lean Six Sigma". Australia.

This study aims to inspect the relationship between the successful deployment of Lean Six Sigma and a number of key helpful variables that essential include the competence of the organization, the competence of the deployment facilitator and the competence of the project leaders.

The study held interviews with two senior Master Black Belts in a large Australian bank, then, combined with the results of a literature review, the researcher develop a conceptual model. A number of hypotheses are established using empirical testing. The hypotheses are briefly clarified. Open questionnaire was used to collect data.

Conclusions of this study were: Technical and interpersonal attributes of Black Belts and Master Black Belts are recognized as well as the factors for success in

deploying Lean Six Sigma. Also produced a prognostic model for the successful deployment Lean Six Sigma.

Finally other research may involve an in-depth case study of one of the large organizations that employ a large number of Master Black Belts and Black Belts.

3.3 Comments of Previous Studies

It was noticed that from these previous studies most of them were recently published. Therefore alerting the novelty of organizations to lean six sigma approaches in health care industries.on the other hand it used more than in the manufacturing sector.

Most of recommendations of these studies were : implementation of (LSS) is necessary to create successful profitable organizations. Needing Infra structure, resources, man power and finance resources. In this section we will show the aspect of agreement and disagreement with previous study.

3.3.1 Study Similarities with Previous Studies

- **According to study environment**

Some studies is similar to this study according to study environments since this study was held at clinics so corresponded with (Sabry,2014),(Abu aida , drawees.& Eda, 2015), (Lindskog et.al , 2016) (Bhat& E.V. Gijo et .al,2014), (Burges& Radnor,2013),(Anbari & Tabaraie,2013), (S. BUCCI1, A.G. DE BELVIS etal,2016)which conducted their studies in hospitals and clinics.

- **According to study variables**
- The aim of this study was to explore the(LSS)approach in health care sector consistent with (Zorab 2012),(Chiarini, 2013),(Jawada, 2011),which searched about (SS). Burges& Radnor(2013)which clarified about and corresponded with(Hilton & Sohal, 2012)which took about (LSS).
- Study used SERVQUAL consistent with (Lau, Cheung,& et al, 2013).
- Some studies aim to evaluate (LSS) applications: (Jorma & Tiirinki,et al, 2016), (Burges& Radnor,2013)also (Abuosi and Atinga, 2013) aims to evaluate Lean in health care. Eriksson (2017) aims to evaluate the development of health after

(SS)implementation. As well as(Abu aida, drawees&. Eda 2015), (Ramez, 2012), and (Lindskog et.al ,2016).

- Other studies clarified (LSS) tools and its benefits ,as (DMAIC) , 5S VMS and so on as:(Andreia Macedo Gomeset al,2016), (Gomes, Senna,& Pinha et,al, 2016), (Arafeh, 2016), (Eshawi, ,2014), (Gomeset, Senna, .al,2016), (Lean in healthcare: Engagement in development, job satisfaction or exhaustion). (Bhat, 2014), (Abdulla , 2012), (Eshawi, ,2014).
- **According to study methodology**

The current study consistent with most of the previous studies by using the Descriptive analytical approach like: (Abu aida, drawees. Eda, 2015) (ElQassas, 2013) (Abdulla Heba, 2012),(Jawada2011)(Gomeset, Senna, .al,2016) (Al Manaseer,2014), (sulieman2013)(Vesna& Branislav, 2016).

- **Tools of collecting data**

Most of studies used questionnaire to collect data, that agreed with this study, the studies that approved with this study (Sabry2014).(Jawada2011),(EL Qassass khalid 2013) ,(Lindskog et.al ,2016), (Abuosi and Atinga2013**),** -(Hilton J. Roger and Sohal Amrik,2012)**,** (Vesna, Branislav, 2016),(Nour,El-naaemy,El-Rawy2012).(Abuosi and Atinga2013)(Basher2017)(Al Damour et al2014).

3.3.2 Aspects of Differences

- **According to study environment**

Many previous studies were conducted in different environments, such as :

- Banks (Lau, Cheung,et al2013), (Hilton & Sohal,2012), (Ramez 2012), (Albahi2016)
- Factories (El Udily, 2014), (Rezek, 2016). - (El Sharify zainab2012)
- University or school- (Arafeh 2016) -(Salman 2013).

- **According to study variables**

Most of study handles with the effect of application (LSS) approach in Health industry .But some of them conducted the possibility of implementation, deployment as (Rezek, 2016), (S. BUCCI1, A.G. DE BELVIS etal,2016), (Hilton & Sohal,2012),

(Chiarini, 2013)((Hilton & Sohal,2012).Also seek about quality as(Lau, Cheung,& Lau et al., 2013)and(Abuosi & Atinga, 2013)while other studies seek about SERVQUAL like(Mathew and Jagannathane, 2015).

- **According to study methodology**

The researcher used descriptive analyses approach agreed with some studies but disagree with others :

- Experimental study as(Zoarb,2012).
- Empirical studies as (Salman, 2013), (El Qassas, 2013),(Abdulla, 2012),(Albliwi, Antony etal.,2014), (Brkic, Tomic, 2016).
- Exploratory study (El Sharify,2012).

- **Tools of collecting data**
  - Questionnaire was designed to collect data in this study, agreed with some studies and disagree with others. Consistent with (Abdall,2012,Jawda,2011,Ramez,2012).
  - Another selected direct observation((Nayar, Ojha2016)
  - Interview was conducted as (Hilton & Sohal,2012).
  - Content analyses as (Burges , Radnor,2013),(Gomeset .al 2016) .
  - Systematic literature review as(Albliwi, Antony etal.,2014), (Gomes, Senna, Denis Pinha etal.,2016).
  - Survey as (Nayaret,Ojha et al., 2016),

3.4 Research Gap

In Palestinian studies there are lacking of research on Lean Six Sigma practices in Health care and physical therapy field. Depending on Palestinian previous studies no studies were conducted on Lean Six Sigma in the health care .On the other hand in the west Bank also no studies have been done on Lean Six Sigma at the physiotherapy field. In general (LSS) approach in the physiotherapy field is poorly found based on previous studies. A little studied were found in physical therapy (Cavalheiro, Caserta Eid,2015)which talked about design to measure the quality of care in(PT). Moon and Bhatia(2015) clarified the occupational disorders, also (Gharibi&Tabrizi2014) talked about service quality intervention in(PT).In Gaza Strip one study was done at the health

sector in the governmental hospitals talked about (SS)(Jwada,2011.)This study is the first important study on physiotherapy services in Gaza strip according to researcher knowledge. Most of studies were on private or public sector but this study targeted the UNRWA organization which considered the most important organization who gave Palestinians refugees free services .

3.5 Benefits of Previous Studies

- The theoretical framework of foreign studies will be transferred to the Arab region (Learning and benefiting from others experts).
- Help to choose a new subject to be studied.
- Help to choose study population, the suitable sample and data collection tool.
- Help to discus and explain the results.
- Clarify the method to do the best tools of study.

3.6 Conclusion

This chapter highlighted the most relevant studies were conducted on Lean, Six Sigma , Lean Six Sigma and quality service in both health care and physiotherapy .The previous studied helped to illustrate research gap, agreement and disagreement with this study.

Finally it showed, how (LSS)approach transferred from manufacturing sector to health care achieving a lot of advantages.

Chapter 4
The Research Methodology

Chapter 4
The Research Methodology

4.1 Introduction

The main objective of this chapter is to describe the quantitative methodology used in this research. The chapter describes the research design, research population, questionnaire content, statistical procedures, data analysis, content validity and pilot study.

4.2 Research Design

The research design is essential as it is an image of the maneuver's flow in the research .The first stage shows the thesis proposal ,classifying, defining the problems ,creation objectives of the study and development research plan. The second stage explains a summary of the comprehensive literature review. A literature on privilege Lean ,(LSS)and quality were reviewed. The third stage clarifies the field survey of study related to study variables, which explained (LSS) and its impacts on service quality. The fourth stage of the research concentrates on the amendment of the questionnaire design, through distributing two questionnaires to pilot study, The purpose of the pilot study was to test and prove that questionnaires questions are clear to be answered in a way that help to achieve the target of the study. The questionnaires were modified based on the results of the pilot study. The fifth stage explains distributing questionnaires. The questionnaires were used to collect the required data in order to achieve the research objectives. The sixth stage of the research was data analysis and discussion. SPSS was used to accomplish the essential analysis. The final phase includes the conclusions and recommendations.

4.3 Research Methodology

The descriptive analytical approach was followed to accomplish this research, which is known one of the most methodologies used in business and social studies. This approach try to describe the phenomena which the subject has studied, analyzed its data, the relation between variables, and the effects may it causes

Figure (4.1) shows the methodology flowchart, which leads to achieve the research objective.

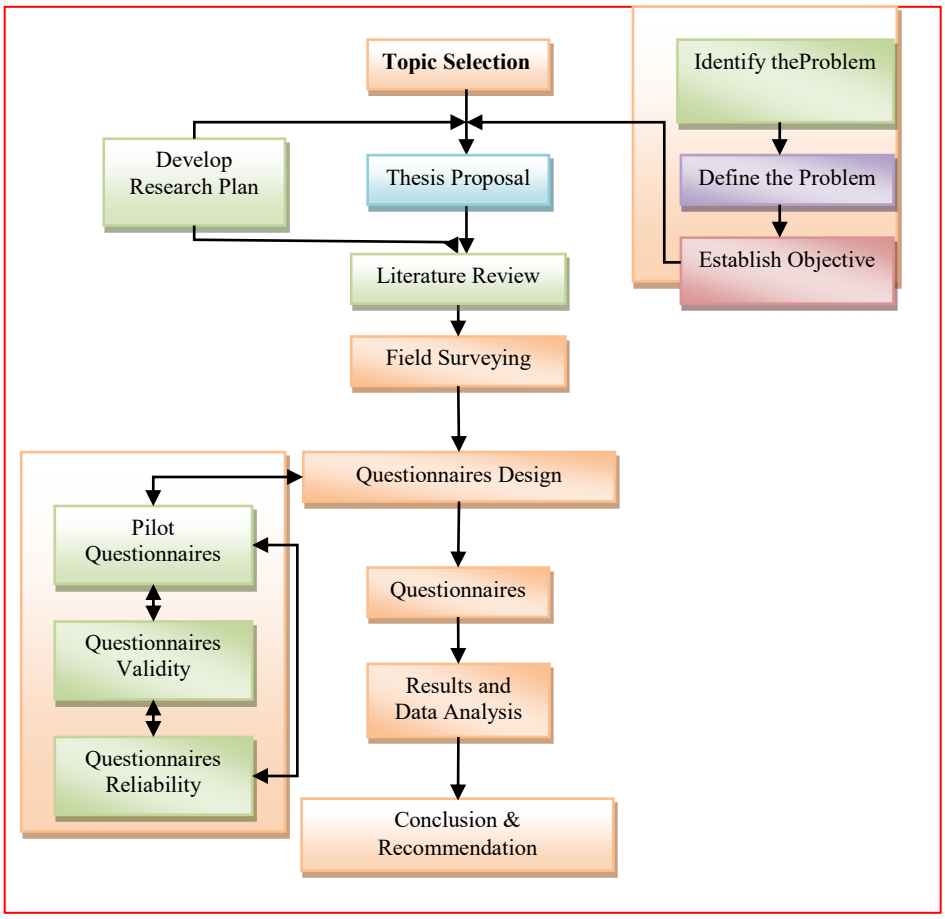

Figure (4.1): The methodology flow chart.

Source: (Prepared by researcher based on Ramez ,2012)

4.3.1 Duration of Study

The study was located from September, 2016 to June, 2017. Data collection was gathered from (10) July to (30) August 2017.

4.3.2 Place of the Study

Since the study has conducted in Gaza Strip, Health Care Centers are chosen to be the work field at UNRWA as they are the major sector that covering these services .As the physiotherapy units are not found in all health centers all health centers provide physiotherapy care are included in the study, which has been found in (11) centers from (22) centers.

4.3.3 Data Collection Methodology

To gather data which was needed to achieve successfully this research. The researcher used two resources of data:

4.3.3.1 The secondary resources

In collecting such data to establish the theoretical literature of the subject, the researcher applied sufficiently of secondary data resources to explicate the problem and attain a lot of information .This resource is essential to attain explanations of the research .and what has been already done .The used secondary resources included:

- Scientific journals, articles and academic magazines.
- Books and research paper.
- Internet articles and websites.
- Thesis and dissertations accessed through the universities' libraries

4.3.3.2 A primary resources

When data couldn't be available in secondary resources, it collected through two designed questionnaires were distributed to two samples of two targeted populations for research purpose. This source helps to analyze all aspect of study through the two questionnaires, the first one was distributed to all physiotherapist worked in Health centers of UNRWA clinics, which consist of two parts, the first part about Lean Six Sigma dimensions and the second part of service quality. While the second questionnaire was distributed to patients attending(PT) unites consisting of (15) paragraph about physiotherapy quality services .The two questionnaires were outcomes of the literature review and have been adjusted concerning the supervisors' recommendations.

4.4 Study Population

The study population which defines all aspects of the phenomenon have studied by the researcher, based on the problem of study and its objectives "The impact of lean six sigma practices on physiotherapy service quality at UNRWA health center" , the study targeted two populations:

1. Patients who visit UNRWA health care centers in Gaza for physiotherapy care, the number patients are nearly (2165) who under treatment from the first of January2017 -to the end of August 2017.The number was obtained from UNRWA Gaza field office according to the annual and monthly reports of the Health Centers for the year 2017.
2. The employees in the physiotherapy units of total (49) .The number of employees was taken from UNRWA human resources /2017.

4.5 Study sample

The researcher used the equation of Stephen Sampson to determine the sample size of patients population according to the following parameters; Cl 95%, P value. 50%, error proportion =0.05(Bishmani,2014)as it seen in item No 1.

1. Stratified random sampling of (327) patients was attending UNRWA Health centers to physiotherapy units during the year 2017 , was selected from the target population .The researcher increases the sample size to be (330) subjects to compensate non respondents and dropped cases. A total of(285) questionnaires were received with respond rate of(86.7%).
2. As the physiotherapy units are not found in all Health centers, all Health centers provide physiotherapy for care are included in the study .The researcher used comprehensive survey method through questionnaire was designed to accomplish this study and distributed to all employees of total (49). A total of(43) questionnaires were collected with respond rate of(86.7%).

4.6 Research Instruments and Measures

In order to be able to choose the appropriate method of analysis, the standard of measurement must be cleared . So one or more a suitable method/s that can be useful and not others. According g to previous studies, some of Palestinian university professors and supervisors helped identifying areas of questionnaires.

Two questionnaires were designed to finish this study. The first questionnaire which distributed to the employees, was provided with a covering letter clarifying the

objectives of the study, the way of responding, the purpose of the research and the security of the information in order to encourage a high response. The questionnaire included multiple paragraph with multiple answers. which used widely in the questionnaire, the variety in these answers aims to meet the research objectives, and to collect all the necessary data that can support the discussion, results and recommendations in the research. The second questionnaire consists of(15) paragraph was answered with Yes or No ,by the patients.

The sections in the questionnaires will clarify the objectives in this research related to the impact of lean six sigma practices on physiotherapy quality services at UNRWA health centers -Gaza Strip as the following:

- **First Questionnaire Content**

Part one: Personal information include 4 items

Part two: lean Six Sigma Dimensions consist of five fields as follows based on (Suliman ,2013)

- The first dimension: (Define)includes 7 items.
- The Second dimension:(Measure) includes 6 items.
- Third dimension :(Analyzes) includes 6 items.
- Fourth dimension :(Improve) includes 7 items.
- Fifth dimension: Control phase includes 6 items.

Part two: Service quality consists of five fields as follows based on (Yarimogula,2014):

- The first field: Tangibility includes 6 items.
- The Second field: Reliability includes 5 items.
- Third field : Responsiveness includes 3 items.
- Fourth field: Assurance includes 4 items.
- Fifth field: Empathy includes 4 items.

The respondent can answer the questionnaire item follows Likert scale by determining it with a number from 1 to 5 indicating his/her acceptance degree of this

item, where (5) represents the highest acceptance degree about an item and (1) represents the lowest acceptance degree about it as illustrated in table No.(4.1)

The data was coded and entered into the computer, according to Likert scale. To determine the length of the period of the five-dimensional Likert scale (the minimum and upper limits) used in the study axes, it was calculated as(5-1=4), (4/5 = 0.8), then this value was added to the lowest value in the scale (which is equal to one).To determine the upper limit for the first period and so on. Next divided 1-0.8/5=20% to 36%.

Table (4.1): Likert scale

Level	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Scale	1	2	3	4	5
Weight mean	20%-36%	36%-52%	52%-68%	68%-84%	84%-100%

Prepared by researcher.

Table (4.1) showes one sample t test procedure to test the opinion of the respondent in the content of the sentences .If they are positive (weight mean greater than "60.0%" and the p-value less than 0.05or the opinion of the respondent in the content of the sentences are neutral (p- value is greater than 0.05) or the opinion of the respondent in the content of the sentences are negative (weight mean less than "60.0%" and the p-value less than 0.05) .

4.7 Questionnaire validity

The validity of a questionnaire is the degree to which evidence and theory support the interpretations of test scores and reflected the degree to which it measures what it claims to measure. High validity is the absence of regular errors in the measuring tool. when an tool is valid; it truly reflects the concept it is supposed to measure. accomplishing good validity desired, the care in the research design and sample selection. The questionnaire validity has been examined and measured by two methods.

- **Experts Validation**

The questionnaires' validity was judged by (6) professionals in the field from different universities (Islamic University of Gaza, Management &Politics Academy, Al Azhar University, UNRWA) The expertise approved that the questionnaire was valid and appropriate enough to measure the purpose that the questionnaire designed for. See appendix **(A)**.

- **Pilot study**

Piloting was done on 30 patients and 10 physiotherapists who selected by convenient sampling from the Health Centers in Gaza. It provides a test run for the questionnaires, which involves testing the words of question, identifying unclear questions, testing the techniques that used to collect data, and measuring the effectiveness of standard invitation to respondents.

4.8 Statistical Validity of the Questionnaire

To adjust the validity of the questionnaire, two statistical tests should be applied. The first test is Criterion-related validity test (Pearson test) which measures the correlation coefficient between each item in the field and the whole field. The second test is structure validity test (Pearson test) that used to test the validity of the questionnaire structure by testing the validity of each field and the validity of the whole questionnaire. It measures the correlation coefficient between one filed and all the fields of the questionnaire that have the same level of similar scale.

4.8.1 Criterion Related Validity

- **Internal consistency**:

Internal consistency reliability is a measure of how well the items on a test measure the same construct or idea, through measuring the correlation coefficients between each question in one field and the whole filed .Table's below shows the correlation coefficient and p-value for each field items. As show in the table the p-values are less than 0.05 or 0.01,so the correlation coefficients of this field are significant at $\alpha = 0.01$ or $\alpha = 0.05$, so it can be said that the paragraphs of this field are consistent and valid to be measure what it was set for.

Table(4.2): Part one: lean Six Sigma Dimensions the correlation coefficient between each paragraph in the field and the whole field

Define			Measure			Analyze			Improve			Control		
No.	**Pearson coefficient**	**P-value**	**No.**	**Pearson coefficient**	**p-value**	**No.**	**Pearson coefficient**	**P-value**	**No.**	**Pearson coefficient**	**P-value**	**No.**	**Pearson coefficient**	**P-value**
1	0.852	0.000	1	0.386	0.035	1	0.745	0.000	1	0.729	0.000	1	0.757	0.000
2	0.871	0.000	2	0.598	0.000	2	0.715	0.000	2	0.597	0.000	2	0.681	0.000
3	0.721	0.000	**3**	0.669	0.000	**3**	0.595	0.001	**3**	0.524	0.003	**3**	0.550	0.004
4	0.758	0.000	**4**	0.717	0.000	**4**	0.615	0.000	**4**	0.585	0.001	**4**	0.462	0.020
5	0.798	0.000	**5**	0.662	0.000	**5**	0.698	0.000	**5**	0.699	0.000	**5**	0.485	0.007
6	**0.770**	**0.000**	**6**	**0.412**	**0.024**	**6**	**0.745**	**0.000**	**6**	**0.661**	**0.000**	**6**	**0.718**	**0.000**
7	**0.793**	**0.000**							**7**	**0.543**	**0.002**			

Table(4.3):Part two: Service Quality The correlation coefficient between each paragraph in the field and the whole field

Tangibles			Reliability			Responsiveness			Assurance			Empathy		
No.	**Pearson coefficient**	**P-value**	**No.**	**Pearson coefficient**	**P-value**	**No.**	**Pearson coefficient**	**P-value**	**No.**	**Pearson coefficient**	**P-value**	**No.**	**Pearson coefficient**	**P-value**
1	0.498	0.005	**1**	0.377	0.040	**1**	0.479	0.015	**1**	0.414	0.023	**1**	0.630	0.000
2	0.645	0.000	**2**	0.583	0.001	**2**	0.453	0.012	**2**	0.645	0.000	**2**	0.667	0.000
3	0.530	0.006	**3**	0.565	0.001	**3**	0.666	0.000	**3**	0.785	0.000	**3**	0.386	0.035
4	0.621	0.000	**4**	0.631	0.000				**4**	0.566	0.001	**4**	0.598	0.000
5	0.725	0.000	**5**	0.782	0.000									
6	0.651	0.000												

4.2.8 Structure Validity of the Questionnaire

Structure validity is the second statistical test that used to test the validity of the questionnaire structure by testing the validity of each field and the validity of the whole questionnaire. It measures the correlation coefficient between one filed and all the fields of the questionnaire that have the same level of likert scale.

As shown in table No. (4.5), the significance values are less than 0.01, so the correlation coefficients of all the fields are significant at $\alpha = 0.01$, so it can be said that the fields are valid to be measured what it was set for to achieve the main aim of the study.

Table (4.4): Structure Validity of the Questionnaire

Part	No.	Section	Pearson correlation coefficient	p-value
Part one: lean Six Sigma Dimensions	**1**	Define	0.792	0.000
	2	Measure	0.863	0.000
	3	Analyze	0.920	0.000
	4	Improve	0.608	0.000
	5	Control	0.716	0.000
Part two :Service Quality	**1**	tangibility	0.828	0.000
	2	Reliability	0.826	0.000
	3	Responsiveness	0.842	0.000
	4	Assurance	0.783	0.000
	5	Empathy	0.712	0.000

4.9 Second Questionnaire Content

It consists of (15) paragraph about service quality produced to patient attending physiotherapy units. The paragraph was answered with yes or no by patients. Based on (Al Dmour,2012).

4.10 Reliability of the Research

Reliability point to the degree to which the results obtained by a measurement and procedure can be replicated .That's mean the same results should be obtained .The test is repeated to the same sample of people on two occasions and then compares the scores obtained by computing a reliability coefficient. For the most purposes reliability coefficient above 0.70 are considered satisfactory. Period of two weeks to a month is recommended between two tests due to complicated conditions that the patients facing at the time being, it was too difficult to ask them to responds to our questionnaire twice within short period. The researcher explained that, overcoming the distribution of the questionnaire twice to measure the reliability can be achieved by using Kronpakh Alpha coefficient and Half Split Method through the SPSS software.

4.10.1Half Split Method

This method depends on finding Pearson correlation coefficient between the means of odd rank answers and even rank answers of each field of the questionnaire. Then, correcting the Pearson correlation coefficients can be done by using Spearman Brown correlation coefficient of correction. The corrected correlation coefficient (consistency coefficient) is computed according to the following equation:

Consistency coefficient = 2r/(r+1), where r is the Pearson correlation coefficient. The normal range of corrected correlation coefficient 2r/(r+1) is between 0.0 and + 1.0

As shown in Table No.(4.5), and the general reliability for all items equal 0.882, and the significant (α) is less than 0.05 so all the corrected correlation coefficients are significance at α = 0.05. It can be said that according to the Half Split method, the dispute causes group are reliable.

Table (4.5): Split-Half Coefficient method

Part	No.	Section	person-correlation	Spearman-Brown Coefficient
Part one: lean Six Sigma Dimensions	**1**	Define	0.717	0.835
	2	Measure	0.738	0.849
	3	Analyze phase	0.698	0.822
	4	Improve	0.750	0.857
	5	Control phase	0.675	0.806
Part two : Service Quality	**1**	Tangibility	0.749	0.856
	2	Reliability	0.783	0.878
	3	Responsiveness	0.791	0.883
	4	Assurance	0.804	0.891
	5	Empathy	0.753	0.859
All items			0.789	0.882

4.10.2 Cronbach's Coefficient Alpha

This method is used to measure the reliability of the questionnaire between each field and the mean of the whole fields of the questionnaire. The normal range of Cronbach's coefficient alpha value between 0.0 and + 1.0, and the higher values reflects a higher degree of internal consistency. As shown in Table No. (4.6) the Cronbach'scoefficient alpha was calculated. The general reliability for all items equal

0.897. This range is considered high; the result ensures the reliability of the questionnaire.

Table (4.6): for Reliability Cronbach's Alpha

Part	No.	Section	Cronbach's Alpha
Part one: lean Six Sigma Dimensions	1	Define	0.847
	2	Measure	0.862
	3	Analyze	0.857
	4	Improve	0.877
	5	Control	0.846
Part two : Service Quality	1	Tangibility	0.780
	2	Reliability	0.899
	3	Responsiveness	0.885
	4	Assurance	0.901
	5	Empathy	0.879
All items			0.897

4.11 Tests of Normality

Shapiri-wilk test was used to identify if the data follow normal distribution or not, this test is reflected the necessity in case testing hypotheses as most parametric Test stipulate data to be normality distributed and this test used when the size of the sample are less than or equal (0.05)**.**Results test as shown in table (4.7), clarifies that the calculated p-value is greater than the significant level which is equal 0.05 (p-value. > 0.05), this in turn indicates that data follows normal distribution, and so parametric Tests must be used.

Table (4.7): Shapiri-wilk

Part	No.	Section	Statistic test	P-value
Part one: lean Six Sigma Dimensions	**1**	Define	1.096	0.181
	2	Measure	1.108	0.172
	3	Analyze	1.069	0.203
	4	Improve	1.025	0.244
	5	Control	0.971	0.349
Part two : Service Quality	**1**	Tangibility	0.981	0.709
	2	Reliability	1.047	0.228
	3	Responsiveness	0.727	0.751
	4	Assurance	0.077	0.088
	5	Empathy	0.960	0.150
All items			1.045	0.254

4.12 Statistical Manipulation

To achieve the research goal, researcher used the statistical package for the Social Science (SPSS) for Manipulating and analyzing the data.

Statistical methods are as follow:

1. Frequencies and Percentile
2. Alpha- Cronbach Test for measuring reliability of the items of the questionnaires
3. Person correlation coefficients for measuring validity of the items of the questionnaires.
4. Spearman –Brown Coefficient
5. One sample t test
6. Independent samples T test for the difference between two means of independent samples.
7. One way ANOVA test for the difference between means three samples or more.
8. Multiple Regression Model
9. .Step wise method .
10. Shapiri-wilk test.

4.13 Conclusion

This chapter has explained the research methodology through classifying different tools and ways of the study. It also contains explanation of both the study population and the targeted sample .Finally the chapter has presented the statistical methods were used in results analysis.

Chapter 5
Data Analysis and Discussion

Chapter 5
Data Analysis and Discussion

5.1 Introduction

The objective of this chapter is to clarify comprehensive report about the findings resulted from applying the statistical tests on the collected data from the two questionnaires. The chapter also contains discussion of the results with justifications for the main results.

5.2 Respondents Characteristics

In this part , the researcher defines and analyzes the respondents' personal characteristics (gender, age, career level, years' experience and governance). Each one of them is defined and analyzed separately. The frequency and percentage for each variable is listed according to the survey categories. The following tables describe five results:

5.2.1 Gender

Table(5.1): Analyzing gender variable

Gender	Frequency	Percentages
Male	22	51.2
Female	21	48.8
Total	43	100.0

The gender statistics in table (5.1) showed " 48.8%" of the sample are female and" 51.2% "of the sample are male. Which is considered natural distribution according to equal chance for each one in employment process based on UNRWA policy .The results consistent with (Wathek, 2012)which found that also no big difference between male and female in the study sample, since the respondents of this study showed"52.34%"male,and "47.66% " were female of target population .While (Lindskog , Hemphäla, Eklund, etal., 2016)showed different result as the response rate was "65%" of target population and the majority of the respondents were women "86.2%".also (Jawada, 2011)concluded that there is a difference in the study sample about gender since the male ratio was"61.8%" and the female was"38.2%".

5.2.2 Age

Table (5.2): Analyzing age variable

Age	Frequency	Percentages
< 25 years	14	32.6
From 30 to <45 years	3	7.0
From 25 to < 30 years	15	34.9
>45 years	11	25.6
Total	43	100.0

The age statistics in table (5.2) showed 32.6% from the sample's age "< 25 years " , 7.0 5 "From 30 to <45 years " , 34.9% "From 25 to < 30 years " , and 25.6% ">45 years " .

Regarding this result to the majority of respondents were from the job creation program .They are a new graduation and to the new jobs of physiotherapist sine 5 years ago, as the age of new employees in this range. while the age from 30 to<45years which showed "7%"is regarded to the new employment after the war of 2009, the employees were around the same ages .Also consistent with (Abdulla,2012)which illustrated the most study sample ages were between 31to 40 years and (Jawada ,2011) concluded the same range. While disagree with ((Noor, El-Naaemy2012)which illustrated that the age of sample were between30to49year.

5.2.3 Career Level

Table (5.3): Career Level

Career Level	Frequency	Percentages
Physiotherapist	22	51.2
Assistant Physiotherapist	21	48.8
Total	43	100.0

The career statistics in table(5.3) showed "51.2% "from the sample of career level are "Physiotherapist " , and" 48.8%" are Assistant Physiotherapist.

Regarding this results to the new jobs which distributed between physiotherapist and physiotherapy assistants ,also most of physiotherapist assistance transfer to physiotherapist to improve their skills and job status which will increase their salaries

and business needs who have Bachelor degree. In the line with (Abdullah,2012)which concluded that the study career were distributed between two category Master and Bachelor degree. And wasn't in the line with(Noor, El- Naaemy, 2012)that illustrated that the sample was of three categories Bachelor ,Master and Ph.D. degrees.

5.2.4 Years of Experience

Table (5.4): Analyze Years' experience variable

Years of Experience	Frequency	Percentages
< 5 Years	15	34.9
From 5 to < 10 years	9	20.9
From 10 to < 15 years	10	23.3
> 15 years	9	20.9
Total	43	100.0

The years' experience statistics in table (5.4) showed 34.9% from the sample of years of experience are "< 5 Years " , 20.9% are "From 5 to < 10 years " , 23.3 % are "From 10 to < 15 years " , and 20.9 % are " > 15 years " .

This results indicated that majority of employees who have years of experience less than (5) years are new graduation who have job creation program . that's why the ratio is the highest one, and this statistics corresponded with statistics of ages. The other categories are neutral distribution. It is contrariwise with (Abdullah2012)concluded that the ratio "7%" less than 5years and the study of (Jwada,2011)concluded that"7%"less than 15 years.

5.2.5 Governorate

Table (5.5): Governorate

Governorate	Frequency	Percentages
Gaza	12	27.9
The middle of Gaza strip	8	18.6
North of Gaza strip	12	27.9
Khan Younis	4	9.3
Rajah	7	16.3
Total	43	100.0

Governorate statistics in table (5.5) showed 27.9% from the sample from “Gaza “ , 18.6% from “The middle of Gaza strip “ , 27.9% from “North of Gaza strip “ , 9.3% from “Khan Younis “ , and 16.3% from “Rafah “.

Regarding this results to the majority of Health Centers are located in Gaza and north Gaza as (3) centers located in Gaza and(3)centers in north Gaza strip. While (2)centers in the middle Gaza strip,(1)centers in Khan yonis and (2)centers in Rafah. The center in khan yonis area introduces services to all refugees from this area.

5.3 Questionnaires analyze contents

In this section the researcher discusses the contents of the two questionnaires .The first questionnaire was distributed for employees and consists of two parts the first part is about Lean Six Sigma dimensions and the second part about quality service dimensions.

5.3.1 Lean Six Sigma Dimensions

5.3.1.1The first dimension(Define)

One sample t test procedure was used to check the opinion of the respondent about (How the problem will be define) and the results were shown in Table No. (5.6) Recording according to weight mean from highest to lowest as follows:

1. In item No. (1) the weight mean equal " 92.09%" and p-value equal " 0.000" which is less than 0.05, that means (Team work is done within physiotherapy units when a problem occurs in the department).
2. In item No. (3) the weight mean equal " 86.05%" and p-value equal " 0.000" which is less than 0.05, that means (A roadmap for the work is developed (a protocol - instructions) that is referred to when any problem occurs within the departments.)
3. In item No. (2) the weight mean equal " 85.58%" and p-value equal " 0.000" which is less than 0.05, that means (A team leader is chosen according to a specific criterion that has the ability to solve problems skillfully).
4. In item No. (6) the weight mean equal " 84.65%" and p-value equal " 0.000" which is less than 0.05, that means (There is feedback when any problem occurs).

5. In item No. (5) the weight mean equal " 80.93%" and p-value equal " 0.000" which is less than 0.05, that means (Problems are identified accurately when they occur.).
6. In item No. (4) the weight mean equal " 74.88%" and p-value equal " 0.000" which is less than 0.05, that means (A draft describes the problem and its dimensions).
7. In item No. (7) the weight mean equal " 62.79%" and p-value equal " 0.473" which is greater than 0.05, that means (Employees are not involved in the selection of new projects (introduction of the health system).

For general the results for all items of the field showed that the average mean equal 4.05and the weight mean equal " 81.00%" which is greater than " 60%" and the value of t test equal 9.857which is greater than the critical value which is equal 2.02 and the p- value equal 0.000 which is less than 0.05, means that The problem is accurately identified by the participation of employees at significance level $\alpha \leq 0.05$.

Table (5.6)illustrated the result in general is positive and accepted .Item No.(1)with weight mean equal to "92% " indicated that there is an approval on team work . Regarding this result to all processes of registration ,treatment and follow up for patients should pass from the physiotherapist to physiotherapy assistance in the units consistent with(Arafeh,2016)which conclude that a clear project definition is vital to the success of the SS project implementation

Also consistent with (Zoarb,2012)which concluded that has got employees agreement with mean equal to (66%). Also all of employees are responsible for the equipment. While item No.(4) with weight mean equal to (74.88%)is relatively positive due to handling with **e**-mails during solving problems ,and the staff don't use a draft for problem solving .while the item No.(7) with weight mean equal to "62.79%" is approximately positive comparing with the other items because establishment of the new projects is the top management responsibility consistent with(Jawada,2011)which concluded that the top management have a clear vision about strategy and policies also (Zoarb, 2012)which concluded that the item of employees contributions with weight mean equal to " 84%" .

Table (5.6): Define phase

No.	Items	Mean	standard deviation	Weight mean	t-value	P-value	Rank
1	Team work is done within physiotherapy units when a problem occurs in the units.	4.60	0.821	92.09	12.824	0.000	1
2	A roadmap for the work is developed (a protocol - instructions) that is referred to when any problem occurs within the departments.	4.30	0.914	86.05	9.346	0.000	2
3	A team leader is chosen according to a specific criterion that has the ability to solve problems skillfully	4.28	0.854	85.58	9.818	0.000	3
4	There is feedback when any problem occurs	4.23	0.972	84.65	8.316	0.000	4
5	Problems are identified accurately when they occur.	4.05	0.872	80.93	7.873	0.000	5
6	A draft describes the problem and its dimensions	3.74	0.819	74.88	5.957	0.000	6
7	Employees are involved in the selection of new projects (E-health system)	3.14	1.265	62.79	0.724	0.473	7
	All items	4.05	0.698	81.00	9.857	0.000	

*Critical value of t at df "42" and significance level 0.05 equal 2.02

5.3.1.2 The second dimension(Measure)

One sample t test procedure was used to check the opinion of the respondent about (Measurement phase) and the results were shown in Table No(5.7)recording according to weight mean from highest to lowest as follows:

1. In item No. (5) the weight mean equal " 93.95%" and p-value equal " 0.000" which is less than 0.05, that means (Patients data is recorded and their files are monitored on a daily basis).
2. In item No. (3) the weight mean equal " 91.63%" and p-value equal " 0.000" which is less than 0.05, that means (Inputs are measured for intra-departmental processes (such as reception of new patients).

3. In item No. (1) the weight mean equal " 90.70%" and p-value equal " 0.000" which is less than 0.05, that means (Data is collected regularly and easily within units.
4. In item No. (2) the weight mean equal " 88.37%" and p-value equal " 0.000" which is less than 0.05, that means (The facts and figures are checked when any problem occurs correctly).
5. In item No. (4) the weight mean equal " 83.72%" and p-value equal " 0.000" which is less than 0.05, that means (Outputs are measured for intra-departmental processes (such as patients' satisfaction with the service provided / patient complaint / liability determination)).
6. In item No. (6) the weight mean equal " 77.67%" and p-value equal " 0.000" which is less than 0.05, that means (An initial report is drawn up on the problems faced by workers and patients after challenging them and trying to resolve them).

For general the results for all items of this field showed that the average mean equal 4.38and the weight mean equal " 87.67%" which is greater than " 60%" and the value of t test equal 17.235which is greater than the critical value which is equal 2.02 and the p- value equal 0.000 which is less than 0.05, means that Inputs are measured for intra-departmental processes (such as reception of new patients), and Patient data is recorded and their files are monitored on a daily basis at significance level $\alpha \leq 0.05$.

Table(5.7) illustrated that positive and accepted results . As item No.(5)with weight mean equal"93.5%" has got employees agreement on good data selection ,registration and measuring output information's in physiotherapy units ,due to the way of recording data of admission and patients files . The data is documented carefully according to same E- system in all units, daily record for files and regular follow upis done. consistent this results with(Noor, El- naaemy, et al 2012)and(Burgess& Radnor,2013)which concluded that there is positive impact of six sigma on processes ,systems, feedback and measurement.

Also the same line of (Abdalluh,2012) which clarified that an agreement on measurement dimension with weigh equal to"78%". Also (Jwada,2011)which mentioned

there is available IS with mean equal to "75%".While the item No.(6) with weight mean equal "77.67%" also positive as most of problems are solved verbally then documented by e-mail .Employees don't get to used initial reports when problems happened. In general UNRWA deals with Advance booking system to organize work flow.

Table (5.7): Measure phase

No.	Items	Mean	standard deviation	Weight mean	t-value	P-value	Rank
5	Patient data is recorded and their files are monitored on a daily basis	4.70	0.513	93.95	21.684	0.000	1
3	Inputs are measured for intra-departmental processes (such as reception of new patients)	4.58	0.545	91.63	19.035	0.000	2
1	Data is collected regularly and easily	4.53	0.631	90.70	15.963	0.000	3
2	The facts and figures are checked when any problem occurs correctly.	4.42	0.698	88.37	13.326	0.000	4
4	Outputs are measured for intra-departmental processes (such as patients' satisfaction with the service provided / patient complaint / liability determination)	4.19	0.958	83.72	8.122	0.000	5
6	An initial report is drawn up on the problems faced by workers and patients after challenging them and trying to resolve them	3.88	0.981	77.67	5.907	0.000	6
	All items	4.38	0.526	87.67	17.235	0.000	

*Critical value of t at df "42" and significance level 0.05 equal 2.02

5.3.1.3 Analyses Phase

One sample t test procedure was used to check the opinion of the respondent about (Analyses phase) and the results were shown in Table No. (5.8) Recording according to weight mean from highest to lowest as follows:

1. In item No. (3) the weight mean equal " 93.02%" and p-value equal " 0.000" which is less than 0.05, that means (Data is easily reoffered to when needed).
2. In item No. (2) the weight mean equal " 92.56%" and p-value equal " 0.000" which is less than 0.05, that means (Patient and file data are documented correctly).
3. In item No. (4) the weight mean equal " 87.44%" and p-value equal " 0.000" which is less than 0.05, that means (Statistical methods are used to make reports on daily work).
4. In item No. (1) the weight mean equal " 84.65%" and p-value equal " 0.000" which is less than 0.05, that means (The data are analyzed in an appropriate statistical ways when any problem occurs within sections).
5. In item No. (5) the weight mean equal " 83.26%" and p-value equal " 0.000" which is less than 0.05, that means (Usage of descriptive methods for data storage and archiving).

For general the results for all items of the field showed that the average mean equal 4.41and the weight mean equal "88.19% " which is greater than " 60% " and the value of t test equal 15.40which is greater than the critical value which is equal 2.02 and the p- value equal 0.000 which is less than 0.05, means that the data are analyzed in an appropriate statistical way when any problem occurs within sections, and Usage of descriptive methods for data storage and archiving at significance level $\alpha \leq 0.05$.

Table (5.8) illustrated that the general the results for all is positive and accepted Items No.(3)of the field show weight mean equal "88.19%".This positive result due to accurate Health system used by UNRWA for data facilitating and registrating process(ERP) , consistent with(El Sharify, 2012)that concluded the appropriate , suitable infrastructure of Computers and software Programs to support (SS) implementation and (Arafeh, 2016) concluded that : The forms and correct documents resulting in a good knowledge base for the various departments to manage their teaching processes. Also.(Huddle et al.,2016)concluded that (VSM)tool was successfully used to reduce convoluted scheduling practices.(BUCCI,DE BELVIS,et al,2016),(Vesna& Branislav, 2016),(Bhat. Gijo , &Jnanesh, 2014)confirms this result that data collection and feedback good suitable infra stature of IT gain good processes.

On the other side (Chiarini,2013)illustrated that doctors and nurses' weak use of statistical tools even if they are considered fundamental, and the difficulties to implementation and manage Six Sigma in only a few departments.

Table (5.8): Analyze phase

No.	Items	Mean	standard deviation	Weight mean	t-value	P-value	Rank
3	Data is easily referenced when needed	4.65	0.613	93.02	17.671	0.000	1
2	Patient and file data are documented correctly	4.63	0.578	92.56	18.459	0.000	2
4	Statistical methods are used to make reports on daily work	4.37	0.874	87.44	10.300	0.000	3
1	The data are analyzed in an appropriate statistical manner when any problem occurs within sections	4.23	0.947	84.65	8.534	0.000	4
5	Usage of descriptive methods for data storage and archiving	4.16	0.898	83.26	8.492	0.000	5
	All items	4.41	0.600	88.19	15.404	0.000	

*Critical value of t at df "42" and significance level 0.05 equal 2.02

5.3.1.4 Improvement Phase

One sample t test procedure was used for the opinion of the respondent about (Improvement phase)and the results were shown in Table No. (5.9) recording according to weight mean from highest to lowest as follows:

1. In item No. (3) the weight mean equal " 87.44%" and p-value equal " 0.000" which is less than 0.05, that means (The protocol of physiotherapy is referred to when any problem occurs).
2. In item No. (6) the weight mean equal " 85.12%" and p-value equal " 0.000" which is less than 0.05, that means (Work within a structured and always clear framework).
3. In item No. (2) the weight mean equal " 83.26%" and p-value equal " 0.000" which is less than 0.05, that means (A regular review of the workflow is taken).
4. In item No. (4) the weight mean equal " 79.07%" and p-value equal " 0.000" which is less than 0.05, that means (Employees are involved at all levels).

5. In item No. (1) the weight mean equal " 78.14%" and p-value equal " 0.000" which is less than 0.05, that means (Alternatives are developed after identifying the root causes of the problems).
6. In item No. (7) the weight mean equal " 73.02%" and p-value equal " 0.001" which is less than 0.05, that means (Employees accept any change in work methods easily).
7. In item No. (5) the weight mean equal " 72.56%" and p-value equal " 0.000" which is less than 0.05, that means (The protocol is amended based on a deeper understanding of the problems that may occur).

For general the results for all items of this field showed that the average mean equal 3.99and the weight mean equal " 79.80%" which is greater than " 60%" and the value of t test equal 8.281which is greater than the critical value which is equal 2.02 and the p- value equal 0.000 which is less than 0.05, means that the protocol is amended based on a deeper understanding of the problems that may occur, and work within a structured and always clear framework at significance level $\alpha \leq 0.05$.

Tables (5.9) illustrated that the results of this phase is positive in general . Item No.(3)with weight mean equal "87.4%" is positive that means protocol can be returned to it, during work because of the explicit rules and procedure of work within physiotherapy units , consistent with(Cavalheiro, Caserta Eid, Talerman1et al., 2015)which illustrated that the results of therapeutic planning and the structure of the physical therapy service. While the item No. (7)with weight mean equal "72.65%"is relatively positive so need attention. Any change in UNRWA rules or projects handles by manager so the employees sometimes agree and disagree . UNRWA tries to compensate this gap between protocols and employees ,Thus protocol is amended based on a deeper understanding of the problems that may occur to be distinct organization.

Table(5.9): Improve phase

No.	Items	Mean	standard deviation	Weight mean	t-value	P-value	Rank
3	The protocol of physiotherapy is referred to when any problem occurs	4.37	0.846	87.44	10.638	0.000	1
6	Work within a structured and always clear framework	4.26	0.875	85.12	9.407	0.000	2
2	A regular review of the workflow is taken	4.16	0.898	83.26	8.492	0.000	3
4	Employees are involved at all levels	3.95	0.950	79.07	6.581	0.000	4
1	Alternatives are developed after identifying the root causes of the problems	3.91	0.947	78.14	6.283	0.000	5
7	Employees accept any change in work methods easily	3.65	1.173	73.02	3.641	0.001	6
5	The protocol is amended based on a deeper understanding of the problems that may occur	3.63	0.952	72.56	4.326	0.000	7
	All items	3.99	0.784	79.80	8.281	0.000	

*Critical value of t at df "42" and significance level 0.05 equal 2.02

5.3.1.5 Control phase

One sample t test procedure was used to test the opinion of the respondent about (Control phase) and the results were shown in Table No. (5.10) .Recording according to weight mean from highest to lowest as follows:

1. In item No. (4) The weight mean equal "79.53%" and p-value equal "0.000" which is less than 0.05, that means (Provide staff management with the outputs of processes that reflect the needs of patients).
2. In item No. (1) the weight mean equal " 77.21%" and p-value equal " 0.000" which is less than 0.05, that means (Employees are evaluated continuously by the officials).
3. In item No. (3) the weight mean equal " 74.42%" and p-value equal " 0.000" which is less than 0.05, that means (The staff are evaluated within specific criteria).

4. In item No. (2) the weight mean equal " 70.70%" and p-value equal " 0.002" which is less than 0.05, that means (Solutions are developed for problems that may occur after the evaluation process).
5. In item No. (5) the weight mean equal " 64.65%" and p-value equal " 0.192" which is greater than 0.05, that means (The performance of the staff is not improved based on the evaluation outputs).
6. In item No. (6) the weight mean equal " 53.02%" and p-value equal " 0.075" which is greater than 0.05, that means (Performance is not linked to physical or moral

For general the results for all items of this field showed the average mean equal 3.50 and the weight mean equal" 69.92% "which is greater than " 60%" and the value of t test equal 4.248which is greater than the critical value which is equal 2.02 and the p-value equal 0.000 which is less than 0.05, means that solutions are developed for problems that may occur after the evaluation process, and the staff are evaluated within specific criteria at significance level $\alpha \leq 0.05$.

Tables (5.10)illustrated, significant decline in the results of explanation this phase as the strong point in item No(4)with weight mean equal"79%"because there is feedback between all levels from high to low and low to high according to UNRWA rules but it is not obvious for all employees consistent with (Jawada,201)which concluded that there is a communication ways with rate of "69%".

While item No(5)with weight mean equal "64%"is relatively weak because employee with low performance didn't receive corrective action such as: training to become better . Nevertheless the majority of employee has fully meet expectation in there appraisal performance after evaluation process. And don't have any training to become better consistent with (Zoarab ,2012)which conclude that there is an approval about this item with rate of "84%".

Also (Jawad,2011) and (Tomić B,2015) concluded that an agreement on training program. As item No (6) with weight mean equal (53%)which considered very weak and negative because employees of best performance didn't take moral or physical incentives. This result harmonic with (Sabry, 2014)which concluded critical success factor for (SS) implementation and its impact on performance indicators quality

and(Vesna et al,2016)which concluded that there is relation between(DMAIC)and performance.

Also(Zoarb,2012)which clarified company care of incentives program with weight mean equal to(76%) , but disagreed with (Balushi et al. ,2014) that concluded reward systems are all commonly attributed readiness factors throughout general change management and affect both quality and employees performance. Finally the output of performance appraisal is partnership between the humane resource and health department so cooperation is needed to be distinctive organization and more competitive advanced.

Table (5.10): Control phase

No.	Items	Mean	standard deviation	Weight mean	t-value	P-value	Rank
4	Provide staff management with the outputs of processes that reflect the needs of patients	3.98	0.938	79.53	6.826	0.000	1
1	Employees are evaluated continuously by the officials	3.86	0.966	77.21	5.843	0.000	2
3	The staff are evaluated within specific criteria	3.72	1.031	74.42	4.585	0.000	3
2	Solutions are developed for problems that may occur after the evaluation process	3.53	1.054	70.70	3.326	0.002	4
5	The performance of the staff is improved based on the evaluation outputs	3.23	1.151	64.65	1.325	0.192	5
6	Performance is linked to physical or moral incentives	2.65	1.251	53.02	-1.828	0.075	6
	All items	3.50	0.766	69.92	4.248	0.000	

*Critical value of t at df "42" and significance level 0.05 equal 2.02

Analysis of Part One: lean Six Sigma Dimensions

One sample t test procedure was used to test the opinion of the respondent about (LSS) dimensions and the results were shown in table No. (5.11) recording according to weight mean from highest to lowest as follows:

1. (Analyze phase) with weight mean equal "88.19%" and first rank.

2. (Measurement phase) with weight mean equal "87.67%" and second rank.

3. (Definition Phase) with weight mean equal "81.00%" and third rank.

4. (Improvement phase) with weight mean equal "79.80%" and fourth rank.

5. (Control phase) with weight mean equal "69.92%" and fifth rank.

For general the results for all (LSS) dimensions illustrated that the average mean equal 4.05and the weight mean equal "81.04% "which is greater than " 60%" and the value of t test equal 11.664 which is greater than the critical value which is equal 2.02 and the p- value equal 0.000 which is less than 0.05.

Table (5.11)showed that lean Six Sigma Dimensions is applied in UNWRA health centers -Gaza Strip at significance level $\alpha \leq 0.05$.

That results showed 81.04% that clarified how Lean Six Sigma dimensions are applied as a practices ,but the (LSS) as approach hasn't recognizes completely consistent with (Sabry, 2014)which concluded that the research has found that 17 CSFs out of 19of Six-Sigma quality program implementation existed. Also consistent with (Abdulla, 2012)which found that the banks operating in Gaza Strip in the target sample committed to apply (SS)methodology .

Also (Arafeh,2016)which findings were a good platform for introducing the Six Sigma DMAIC methodology and tools to improve performance and solve process problems in different departments in the target school.

The results also consistent with(Bashir, 2017)which showed that there is an agreement on (TQM)application in health care. (Jwada,2011)agreed with the results as she mentioned in her study finding that a feasibility to apply(SS) in the governmental health care. While (El Sharify,2012) consistent in two results with this study as she illustrated that the factory management encourages and supports the achievement of

quality in all its departments and management does not have a broad knowledge of the (SS) methodology. While(Al Manaseer, 2014)showed that :there is a relationship between applying (SS) and manufacturing strategy.

El Udily(2014)dissimilar to the results of this study as it clarified that the target company didn't apply Six Sigma methodology also it does not have the elements of applying (SS) approach. In addition this study is the first one on physiotherapy field conducted in Gaza strip. Consistent with (Gharibi, Tabriziet, al2014) ,(Cavalheiro et a2015), (Bedi,moon 2015), which explained Six Sigma successes with physical therapy field.

Table (5.11): Lean Six Sigma Dimensions

No.	Items	Mean	standard deviation	Weight mean	t-value	P-value	Rank
3	Analyze	4.41	0.600	88.19	15.404	0.000	1
2	Measure	4.38	0.526	87.67	17.235	0.000	2
1	Define	4.05	0.698	81.00	9.857	0.000	3
4	Improve	3.99	0.784	79.80	8.281	0.000	4
5	Control p	3.50	0.766	69.92	4.248	0.000	5
	All items	4.05	0.591	81.04	11.664	0.000	

*Critical value of t at df "42" and significance level 0.05 equal 2.02

5.3.2 Service Quality

In the second part of questionnaire the researcher discussed quality service dimensions used five dimensions (Tangibles-reliability-responsiveness-assurance and empathy)

5.3.2.1Tangibility

One sample t test procedure was used to test the opinion of the respondent about (Tangibles) and the results were shown in Table No. (5.12) recording according to weight mean from highest to lowest as follows:

1. In item No. (6) the weight mean equal " 94.42%" and p-value equal " 0.000" which is less than 0.05, that means (The staff in the units have an elegant appearance and are fully formalized).

2. In item No. (1) the weight mean equal " 83.26%" and p-value equal " 0.000" which is less than 0.05, that means (The units provides the material needs and within the available resources).
3. In item No. (2) the weight mean equal " 83.26%" and p-value equal " 0.000" which is less than 0.05, that means (Quality goals are known to employees).
4. In item No. (3) the weight mean equal " 73.49%" and p-value equal " 0.000" which is less than 0.05, that means (I think the cost of quality is low and achievable).
5. In item No. (5) the weight mean equal " 69.77%" and p-value equal " 0.028" which is less than 0.05, that means (There is a waiting room for patients and offices of workers within each section).
6. In item No. (4) the weight mean equal " 57.21%" and p-value equal " 0.487" which is greater than 0.05, that means (I believe that quality cannot be achieved without the use of advanced equipment and technology).

For general the results for all items of this field showed that the average mean equal and the weight mean equal "76.90%" which is greater than " 60%" and the value of t test equal 10.899which is greater than the critical value which is equal 2.02 and the p- value equal 0.000 which is less than 0.05, means that there is a waiting room for patients and offices of workers within each section, and the staff in the departments have an elegant appearance and are fully formalized at significance level $\alpha \leq 0.05$.

Table (5.12)illustrated that the results were positive and accepted. As item No (5)with weight mean of "94..4%"was positive and high in its ratio since the employees be careful to have an elegant appearance and are fully formalized, Since the first impression is the last impression so the patient will feels better and more confident with their treatment.

Also the employees interested in achieving best performance so the uniform of employees should be elegant. Consistent with(Bashir 2017)which finding showed that about tangibles fields from employees perspectives were positive. Also consistent with(Lau,Cheung,2013)which illustrated that sufficient staffs are available to provide customers banking services. While the item No .(5) is relatively positive because the employees want a new technology ways in the work hence the world around us

developed and patients' needs also developed. Corresponded with (El Sharify 2012)which concluded that the suitable infrastructure of Computers and software programs support (SS) implementation and leading to quality services , This matching with the results of (Basher, 2017),(Balushi et al, 2014)which concluded that a lack of modern equipment, readiness factor and the slowdown and the delay in providing the service. Also(Albliwi, Antony, et al, 2014)concluded that implementation(SS) approach need resources and infrastructure IT for success organizations.

Table (5.12): Tangibles

No.	Items	Mean	standard deviation	Weight mean	t-value	P-value	Rank
6	The staff in the units have an elegant appearance and are fully formalized	4.72	0.549	94.42	20.562	0.000	1
1	The units provides the material needs and within the available resources	4.16	0.721	83.26	10.569	0.000	2
2	Quality goals are known to employees	4.16	0.843	83.26	9.043	0.000	2
3	I think the cost of quality is low and achievable	3.67	0.944	73.49	4.684	0.000	3
5	There is a waiting room for patients and offices of workers within each section	3.49	1.404	69.77	2.282	0.028	4
4	I believe that quality can be achieved without the use of advanced equipment and technology	2.86	1.302	57.21	-0.703	0.486	5
	All items	3.84	0.508	76.90	10.899	0.000	

*Critical value of t at df "42" and significance level 0.05 equal 2.02

5.3.2.2 Reliability

One sample t test procedures was used to test the opinion of the respondent about (Reliability) and the results were shown in Table No. (5.13) recording according to weight mean from highest to lowest as follows:

1. In item No. (1) the weight mean equal " 91.63%" and p-value equal " 0.000" which is less than 0.05, that means (units are committed to their promises to patients in the provision of therapeutic services provided).

2. In item No. (4) the weight mean equal " 90.23%" and p-value equal " 0.000" which is less than 0.05, that means (The staff in the units are interested in recording information about patients and their health condition).
3. In item No. (3) the weight mean equal " 88.37%" and p-value equal " 0.000" which is less than 0.05, that means (The patients develop their confidence in the workers and in the quality of service provided to them).
4. In item No. (5) the weight mean equal " 87.44%" and p-value equal " 0.000" which is less than 0.05, that means (Patients get service easily).
5. In item No. (2) the weight mean equal " 84.19%" and p-value equal " 0.000" which is less than 0.05, that means (The employees sympathize with the patients when they complain about the level of service provided).

For general the results for all items of this field showed that the average mean equal 4.42 and the weight mean equal 88.37% which is greater than " 60%" and the value of t test equal 15.193which is greater than the critical value which is equal 2.02 and the p- value equal 0.000 which is less than 0.05, means that the patients trust in the employees and in the quality of service provided to them , and patients get service easily at significance level $\alpha \leq 0.05$.

Table(5.13) illustrated that the patients trust in the employees due to the nature of physiotherapy services are provided in P.T units as they have special features of empathy and elegancy. Item No. (1)the weight mean equal "91.63%"showedthat positive and accepted results . Because patients spent a long period in treatment sessions ,regular evaluation and follow up every (6) sessions should be done so units are committed to their promises to patients. Consistent with Yarimoglu(2014) which concluded that, to gain the optimal service quality that customers expect, practitioners should increase employee satisfaction and enhance interactions between employees and customers

while (Ramez,2012)which indicated that the reliability dimension is the most crucial factor influencing service quality.

In addition(Sulieman,2013) showed, the reliability dimension (as a dimension of the quality of services) has interpreted 55,7% of the variation as reliability dimension affects the level of customer satisfaction. In the other side item No (6)with mean equal

84.19% is also positive that's mean the employees sympathize with the patients when they complain about the level of service provided consistent with(Lau,Cheung,2013)which results found that staff can provide customers prompt and appropriate services but dis agree in this item as it takes the second the second rank of the reliability dimension.

Also(Anbari andTabaraie i,2013)clarified that hospitals performed well in some dimensions of service (reliability and empathy).The main important point that UNRWA has clear instructions for work implementation-health system, and take corrective action when disturbance of work happen. Based on Hippocratic oath.

Table (5.13): Reliability

No.	Items	Mean	standard deviation	Weight mean	t-value	P-value	Rank
1	units are committed to their promises to patients in the provision of therapeutic services provided	4.58	0.698	91.63	14.856	0.000	1
4	The staff in the units are interested in recording information about patients and their health condition	4.51	0.668	90.23	14.838	0.000	2
3	The patients develop their confidence in the workers and in the quality of service provided to them	4.42	0.879	88.37	10.581	0.000	3
5	Patients get service easily	4.37	0.900	87.44	9.993	0.000	4
2	The staff members sympathize with the patients when they complain about the level of service provided	4.21	0.709	84.19	11.184	0.000	5
	All items	4.42	0.612	88.37	15.193	0.000	

*Critical value of t at df "42" and significance level 0.05 equal 2.02

5.3.2.3 Responsiveness

One sample t test procedure was used to test the opinion of the respondent about (Responsiveness) and the results were shown in Table No. (5.14) Recording according to weight mean from highest to lowest as follows:

1. In item No. (1) the weight mean equal " 97.21%" and p-value equal " 0.000" which is less than 0.05, that means (The patients are informed about the times of the sessions and the coordination of their dates).
2. In item No. (2) the weight mean equal " 80.47%" and p-value equal " 0.000" which is less than 0.05, that means (The service is provided immediately to patients).
3. In item No. (3) the weight mean equal " 80.47%" and p-value equal " 0.000" which is less than 0.05, that means (The workers respond quickly to the requests of patients despite their busy).

For general the results for all items of this field showed that the average mean equal 4.30and the weight mean equal " 86.05%" which is greater than " 60%" and the value of t test equal 13.060 which is greater than the critical value which is equal 2.02 and the p- value equal 0.000 which is less than 0.05, means that the workers respond quickly to the requests of patients despite their busy at significance level $\alpha \leq 0.05$.

Table (5.14)) illustrated that general results was about 86%As item No.(1)with weight(97.21%)that's mean very high agreement from employees about (patients are informed about the times of the sessions)which explained how the exact time should be respected from patients and employees according to work conditions.

There is commitment of Schedule time , which means that patients is aware very well about time to have complete sessions with accepted quality .And any interruptions will make problems in work flow. Consistent with(Ramez, 2012)which found that responsiveness is the most important influencer of overall service quality with a coefficient score, 364.while(Sulieman2013)clarified that the study mentioned , the responding dimension (as a dimension of the quality of services Responsiveness) has interpreted %43.7of the variation as responding dimension affects the level of customer satisfaction.

Table(5.14): Responsiveness

No.	Items	Mean	standard deviation	Weight mean	t-value	P-value	Rank
1	The patients are informed about the times of the sessions and the coordination of their dates	4.86	0.351	97.21	34.797	0.000	1
2	The service is provided immediately to patients	4.02	0.913	80.47	7.353	0.000	2
3	The workers respond quickly to the requests of patients despite their busy	4.02	0.988	80.47	6.793	0.000	2
	All items	4.30	0.654	86.05	13.060	0.000	

*Critical value of t at df "42" and significance level 0.05 equal 2.02

5.3.2.4 Assurance

One sample t test procedure was used to test the opinion of the respondent about (Assurance) and the results shown in Table No. (5.15) recording according to weight mean from highest to lowest as follows:

1. In item No. (3) the weight mean equal " 92.09%" and p-value equal " 0.000" which is less than 0.05, that means (The employees treat the patients with elegance).
2. In item No. (4) the weight mean equal " 88.84%" and p-value equal " 0.000" which is less than 0.05, that means (Employees have merit, courtesy and credibility).
3. In item No. (1) the weight mean equal " 88.37%" and p-value equal " 0.000" which is less than 0.05, that means (The patients trust the employees with great confidence).
4. In item No. (2) the weight mean equal " 88.37%" and p-value equal " 0.000" which is less than 0.05, that means (Reassures the patient that he is in good hands).

For general the results for all items of this field showed that the average mean the weight mean equal " 89.42% "which is greater than " 60%" and the value of t test equal 16.401which is greater than the critical value which is equal 2.02 and the p-value equal 0.000 which is less than 0.05, means that the patients trust the employees with great confidence , and employees have merit, courtesy and credibility at significance level $\alpha \leq 0.05$.

Table (5.15) illustrated that this phase has been greatly high "89%".In item No. (3) with weight mean equal 92.09% the employees treat the patients with elegance as the physiotherapy needs a period of time to be accomplish ,so good relation between

patient and physiotherapy should be built ,also cases need a kind of privacy about the status conditions consistent with (Lau, Cheung,& Lau et al, 2013)which indicated assurance is another factor emphasized by customers in Hong Kong. The degree of trust and confidence that customers feel about the banking services greatly depends on the services quality provided by the employees.

Also (Basher,2017) explained how the assurance dimension affect the training of employees and health services quality . While item No(2)with weight equal 88.3% that's mean patients feel they are in a good hands . To maximize patients value confidence and trust between the physiotherapy and patients should been held. The most important point that UNRWA objectives are to maximize patients value ,patient should have all their rights in treatment with available resources.

Table(5.15): Assurance

No.	Items	Mean	standard deviation	Weight mean	t-value	P-value	Rank
3	The employees treat the patients with elegance	4.60	0.583	92.09	18.046	0.000	1
4	Employees have merit, courtesy and credibility	4.44	0.734	88.84	12.888	0.000	2
1	The patients trust the employees with great confidence	4.42	0.763	88.37	12.188	0.000	3
2	Reassures the patient that he is in good hands	4.42	0.626	88.37	14.857	0.000	3
	All items	4.47	0.588	89.42	16.401	0.000	

*Critical value of t at df "42" and significance level 0.05 equal 2.02

5.3.2.5 Empathy

One sample t test procedure was used to test the opinion of the respondent about (Empathy) and the results shown in Table No. (5.16) recording according to weight mean from highest to lowest as follows:

1. In item No. (4) the weight mean equal " 92.56%" and p-value equal " 0.000" which is less than 0.05, that means (The best service is provided to patients during the treatment period).

2. In item No. (2) the weight mean equal " 92.09%" and p-value equal " 0.000" which is less than 0.05, that means (The needs of patients (appointments – days. a appropriate for them).
3. In item No. (1) the weight mean equal " 85.58%" and p-value equal " 0.000" which is less than 0.05, that means (Departments are concerned with the personal care of patients).
4. In item No. (3) the weight mean equal " 83.72%" and p-value equal " 0.000" which is less than 0.05, that means (Working hours are compatible with patients' times).

For general the results for all items of this field showed that the average mean equal and the weight mean equal "88.49%" which is greater than " 60%" and the value of t test equal 18.513which is greater than the critical value which is equal 2.02 and the p- value equal 0.000 which is less than 0.05, means that the best service is provided to patients during the treatment period at significance level $\alpha \leq 0.05$.

Table (5.16) illustrated that the results are positive and handled well .Item No. (4) with weight mean equal 92.56%was positive ,that's' mean the best service is provided to patients during the treatment period. Consistent with(Tabaraie and Anbari,2013) which found that the hospitals performed well in some dimensions of service (reliability and empathy) received high perception evaluation scores. And (Ramez ,2012) illustrated that the dimension of empathy was the second important influencer of overall service quality with a coefficient 264.score.

As the units of physiotherapy work with appointment system, data driven ,and employees are aware to keep output of processes well. Based on UNRWA open door policy and patients should have all rights all the time. So the patient have best treatment. While the item No(4)with weight mean equal83.72%has consistent with (Yarimoglu, 2014)and (Anbari&Tabaraie, 2013)that concluded the quality of hospital services increased with usage of SERVQAUAL. To keep accepted quality and accurate appointment system the patients should take the suitable time for treatment .

Table (5.16):Empathy

No.	Items	Mean	standard deviation	Weight mean	t-value	P-value	Rank
4	The best service is provided to patients during the treatment period	4.63	0.578	92.56	18.459	0.000	1
2	The needs of patients (appointments - days) Appropriate for them)	4.60	0.583	92.09	18.046	0.000	2
1	units are concerned with the personal care of patients	4.28	0.766	85.58	10.948	0.000	3
3	Working hours are compatible with patients' times	4.19	0.852	83.72	9.125	0.000	4
	All items	4.42	0.505	88.49	18.513	0.000	

*Critical value of t at df "42" and significance level 0.05 equal 2.02

Analysis of Part Two: Service Quality

One sample t test procedure was used to test the opinion of the respondent about (Service Quality) and the results were shown in Table No. (5.17) recording according to weight mean from highest to lowest as follows:

1. (Assurance) with weight mean equal "89.42%" and first rank.
2. (Empathy) with weight mean equal "88.49%" and second rank.
3. (Reliability) with weight mean equal "88.37%" and third rank.
4. (Responsiveness) with weight mean equal "86.05%" and forth rank.
5. (Tangibles) with weight mean equal "76.90%" and fifth rank.

For general the results for all (Service Quality) showed that the average mean equal 4.26and the weight mean equal 85.14% which is greater than " 60%" and the value of t test equal 18.674which is greater than the critical value which is equal 2.02 and the p- value equal 0.000 which is less than 0.05.That means Quality Service in UNWRA health centers -Gaza Strip at significance level $\alpha \leq 0.05$

Table (5.17) illustrated that (Assurance) with weight mean equal 89.42%was the first rank of quality dimensions in UNRWA physiotherapy services consistent with(Lauand Cheung,2013)which found that (Assurance)is another factor emphasized by customers in Hong Kong .The results also showed that tangibility has a positive

influence on customer satisfaction. Anbariand and Tabaraie(2013) showed that overall, the largest discrepancy between expectations and perceptions was in the tangibles dimension. In other side the dimension (Tangibles) with weight mean equal "76.90% "and fifth rank has explained how employees differ to illustrate facilities, equipment and appearance of personnel.

In addition the results consistent with(Ramez ,2012)which indicated that the overall service quality of health care industry may not be a function of the five dimensions, another studied conduct the impact of quality and how affected on service quality as(Basher,2017)which found that to gain service quality the management should undertake of TQM, and quality dimension affect strategy organization .In UNRWA service quality has great attention from top management. In agreement with (Gharibi, Tabrizi, et al,2014) has shown that the relation between P.T services and quality. Finally(Moon et al.,2015) which mentioned effective measures for reducing muscle disorder by using (DMAIC)methodology.

Table (5.17): Service Quality

No.	Items	Mean	standard deviation	Weight mean	t-value	P-value	Rank
4	Assurance	4.47	0.588	89.42	16.401	0.000	1
5	Empathy	4.42	0.505	88.49	18.513	0.000	2
2	Reliability	4.42	0.612	88.37	15.193	0.000	3
3	Responsiveness	4.30	0.654	86.05	13.060	0.000	4
1	Tangibles	3.84	0.508	76.90	10.899	0.000	5
	All items	4.26	0.441	85.14	18.674	0.000	

*Critical value of t at df "42" and significance level 0.05 equal 2.02

5.3.3 The second questionnaire

Table No. (5.18) Showed the results of the correspondent of patient about questions in a questionnaire from the most approval to the least approval as follows confirm the answer with yes or no:

- (The staff deals with you properly) with percent 99.2% and 1st rank.
- (The level of cleanliness in the sections. Is acceptable) with ratio 98.8% and 2nd rank.

- (There is a level of calm and order (commitment of employees, working within sections) with percentage 98.8% and 2nd rank.
- (We satisfied with the level of service provided by physiotherapy team) with percentage 98.8% and 2nd rank.
- (Rules and regulations are respected within sections) no smoking, calm and order among patient) with percent 96.9% and 3rd rank.
- (Workers in the units privacy during clinical detection) with percent 95.8% and 4th rank.
- (Clear signs are available to facilitate access to patient to reach physiotherapy units) with percent 95.4% and 5th rank.
- (The time period for the session is suitable.) with percent 93.4% and 6th rank.
- (The reservation system sections is applicable) with percent 91.5% and 7tt rank.
- (The employees of the units examined the patient carefully in the first session.) with percent 90.7% and 8th rank.
- (The units has enough treatment cough) with percent 83.8% and 9th rank.
- (Accessibility to reach the clinic easily) with percent 81.1% and 10th rank.
- (Compatible with special needs) with percent 80.3% and 11th rank.
- (Clean and convenient waiting room for patient are available) with percent 70.3% and 12th rank.
- (There is bulletins or educational and health materials) with percent 60.2% and 13th rank.

For general responses of patients about questions are approval with ratio 89.0%.

Regarding these results there is general approval from patients on quality service produced by P.T units at UNARWA health centers .

Table(5.18)illustrated that UNARWA policy committed to its promises to get patients satisfy also employees should do all their best efforts .As open-door policy and patient ought to take all rights in treatment.

To achieve these objectives UNRWA keep attention to both employees and patients consistent with(Abu aida, drawees,2015) which indicated that there is a direct

relation between job satisfaction and the Quality of Health Service.(Basher ,2017)concluded that an awareness among members of the study sample towards the importance of applying total quality management in the hospital .

Albahi (2016)explained how quality dimension affected customer satisfaction. also (Sulieman, 2013) results showed different level of customer satisfaction .Bouguedjani and Al Dmour(2012)showed quality increase with patient loyalty. Also consistent with (Yarimoglu,2014) which mentioned to gain the optimal service quality that customers expect, practitioners should increase employees satisfaction and enhance interactions between employees and customers .while the paragraph of the questionnaire with mean weight 60.2% sine not all units have bulletins or educational.

This referred to the employees activity .

Besides from time to time, clinic administration distributes questionnaires measures patients satisfaction. This censorship obliged the employee with this policy. (Health department-UNRWA, 2017).

Table (5.18): Patients questionnaire

NO.	Item	Disagree		Agree		Rank
		Frequency	Percent	Frequency	Percent	
15	The staff deals with you properly	2	0.8	257	99.2	1
7	The level of cleanliness in the sections. Is acceptable.	3	1.2	256	98.8	2
8	There is a level of calm and order (commitment of employees, working within sections).	3	1.2	256	98.8	2
12	Are you satisfied with the level of service provided by physiotherapy team?	3	1.2	256	98.8	2
5	Rules and regulations are respected within sections) no smoking, calm and order among patient).	8	3.1	251	96.9	3
14	Workers in the units privacy during clinical detection.	11	4.2	248	95.8	4
2	Clear signs are available to facilitate access to patient to reach physiotherapy units.	12	4.6	247	95.4	5
13	The time period for the session is suitable.	17	6.6	242	93.4	6
9	The reservation system sections is applicable	22	8.5	237	91.5	7

NO.	Item	Disagree		Agree		Rank
		Frequency	Percent	Frequency	Percent	
11	The employees of the departments examined the patient carefully in the first session.	24	9.3	235	90.7	8
10	The units has enough treatment cough.	42	16.2	217	83.8	9
1	Accessibility to reach the clinic easily	49	18.9	210	81.1	10
6	Compatible with special needs.	51	19.7	208	80.3	11
4	Clean and convenient waiting rooms for patient are available.	77	29.7	182	70.3	12
3	There is bulletins or educational and health materials.	103	39.8	156	60.2	13
	Total items	**427**	**11.0**	**3458**	**89.0**	

5.4 Research Hypotheses

H1:There is statistical significant relationship at ($\alpha \leq 0.05$) between Lean Six Sigma Dimensions and Service Quality level in physiotherapy units at UNRWA. This hypothesis is divided into five sub-hypothesis

H1.1:There is statistical significant relationship between the first dimension of lean six sigma (Define) and Service Quality at ($\alpha \leq 0.05$) level in physiotherapy units.

To test this hypothesis Pearson correlation coefficient was used to test the correlation between lean six sigma (Define) and Quality Service at significant level ($\alpha \leq 0.05$), and the results in table No.(5.19) showed that the correlation coefficient for all Quality Service fields equal 0.583 > Critical value = 0.298, and p-value equal 0.000 < 0.05, mean that there is a correlation between the first lean six sigma (Define) and Service Quality at significant level ($\alpha \leq 0.05$).

The table(5.19) illustrated that there is a relation between the first dimension of(LSS) (define) and quality service. The employees agreed about how problems can be define when the employees faced problems ,work as team work .to be inform of any new projects through a good leader of (LSS)approach will maximize value .

The Results consistent with(Arafeh,2016)which concluded that The Define phase of the DMAIC process is often skipped or short-changed, but it is vital to the overall success of any Six Sigma project. Also consistent with (Chiarini,2013)which conclude

that when applying Six Sigma inside the public Healthcare industry the organization has to be managed as a whole and all the departments by using the(DMAIC) pattern .

Table (5.19): A correlation between the first dimension Lean Six Sigma(Define) and Service Quality at significant level ($\alpha \leq 0.05$)

Section	Statistic	Tangibles	Reliability	Responsiveness	Assurance	Empathy	All dimensions of (service Quality)
Define	Pearson Correlation	0.359*	0.577**	0.401**	0.590**	0.313*	0.583**
	P-value	0.018	0.000	0.008	0.000	0.041	0.000
	N	43	43	43	43	43	43

H1.2:There is statistical significant relationship between the second dimension of Lean Six Sigma (Measure) and Service Quality at ($\alpha \leq 0.05$) level in physiotherapy units.

To test this hypothesis Pearson correlation coefficient was used to test the correlation between the second dimension of lean six sigma (Measure)and Quality Service at significant level ($\alpha \leq 0.05$), and the results in table No.(5.20) showed that the correlation coefficient for all service quality fields equal 0.608 > Critical value = 0.298, and p-value equal 0.000 < 0.05, that means here is a correlation between The second dimension of Lean Six Sigma (Measure) and service quality at significant level ($\alpha \leq 0.05$) .

The table (5.20)illustrated that there is relation between the second dimension of Lean Six Sigma dimension (Measure)on service quality. That means the employees agreed about how the data can be measured. Because accuracy in collecting of data , recording of patients file daily and an initial report is drawn up on the problems faced by workers and patients after challenging them and trying to resolve them. This is the first step for successes in work. Consistent with(Arafeh,2016) which concluded that a good knowledge base for the various departments to manage their teaching processes

through (SS) methodology. also(Vesna& Branislav, 2016)concluded (SS)will lately enable better employees' performance by applying (DMAIC) methodology.

Table(5.20): A correlation between the second dimension of Lean Six Sigma(Measure) and Service Quality at significant level ($\alpha \leq 0.05$)

Section	Statistic	Tangibles	Reliability	Responsiveness	Assurance	Empathy	All dimensions of (Service Quality)
Measure	Pearson Correlation	0.363*	0.600**	0.347*	0.594**	0.437**	0.608**
	P-value	0.017	0.000	0.023	0.000	0.003	0.000
	N	43	43	43	43	43	43

H1.3:There is statistical significant relationship between the third dimension Lean Six Sigma (Analyze) and Service Quality at ($\alpha \leq 0.05$) level in physiotherapy units

To test this hypothesis Pearson correlation coefficient was used to test the correlation between the third dimension of lean six sigma (Analyze) and Quality Service at significant level ($\alpha \leq 0.05$), and the results in table No.(5.21) which show that the correlation coefficient for all service quality fields equal 0.669 > Critical value = 0.298, and p-value equal 0.000 < 0.05, that means there is a correlation between Lean Six Sigma (Analyze) and service quality at significant level ($\alpha \leq 0.05$) .

Table(5.21) illustrated that there is relation between the third dimension of Lean Six Sigma on service quality. Of course when data is collected it should be analyze to get information that's important to enhance the flow of work. Consistent with(Chiarini,2013)which indicated that statistical tools are more suitable for problem solving and for finding root causes inside activities when Six Sigma teams manage an entire process or a process flow. Bhat andGijo(2016)illustrate that the (LSS)approach with the DMAIC phases will provide systematic approach towards problem solving quickly. In addition(Vesna& Branislav, 2016)indicated that (LSS)approach application through DMAIC or DMADV, 5S and Kanban application will lately enable better employees' performance .Finally (Noor, El- naaemy,2012) showed that there is an

impact of Lean Six Sigma on evaluation; planning and implementation of the audit process.

Table(5.21): A correlation between the third dimension of Lean Six Sigma(Analyze) and Service Quality at significant level ($\alpha \leq 0.05$)

Section	Statistic	Tangibles	Reliability	Responsiveness	Assurance	Empathy	All dimensions of (service Quality)
Analyze	Pearson Correlation	0.351*	0.643**	0.434**	0.612**	0.581**	0.669**
	P-value	0.021	0.000	0.004	0.000	0.000	0.000
	N	43	43	43	43	43	43

H1.4: There is statistical significant relationship between the fourth dimension of Lean Six Sigma (Improve) and Service Quality at ($\alpha \leq 0.05$) level in physiotherapy units.

To test this hypothesis Pearson correlation coefficient was used to test the correlation between the fourth dimension Lean Six Sigma (Improve) and Quality Service at significant level ($\alpha \leq 0.05$), and the results in table No.(5.22) which show that the correlation coefficient for all service quality fields equal 0.753 > Critical value = 0.298, and p-value equal 0.000 < 0.05, that means there is a correlation between lean six sigma (Improve) and service quality at significant level ($\alpha \leq 0.05$).

Table.(5.22)illustrated that there is relation between the fourth dimension of (LSS) (Improve)and service quality. After analyzing data ,working within a structured and always clear framework, a regular reviewing of the workflow and alternatives are developing after identifying the root causes of the problems, so decrease variation of process and remove non added value achieve competitive advance. Consistent with (Arafeh,2016)This project provided a good platform for introducing the Six Sigma DMAIC methodology and tools to improve performance and solve process problems in different units .Zoarb (2012)mentioned that there is approval on this dimension with rate

of (78%). Also(Huddle ,Tirabass2016)Lean Sigma is a valuable tool to improve clinic efficiency and reduce waste. In the physical field (Bedi,moon2015) Physiotherapy with a psychosomatic approach and individual ergonomic instruction can help to provide better relief from pain and discomfort.

Table (5.22): A correlation between the fourth dimension of Lean Six Sigma(Improve) and Service Quality at significant level ($\alpha \leq 0.05$)

Section	Statistic	Tangibles	Reliability	Responsiveness	Assurance	Empathy	All dimensions of (Service Quality)
Improve	Pearson Correlation	0.383*	0.695**	0.555**	0.743**	0.587**	0.753**
	P-value	0.011	0.000	0.000	0.000	0.000	0.000
	N	43	43	43	43	43	43

H1.5: There is statistical significant relationship between the fifth dimension of Lean Six Sigma (control) and Service Quality at ($\alpha \leq 0.05$) level in physiotherapy units.

To test this hypothesis Pearson correlation coefficient was used to test the correlation n between the fifth dimension of lean six sigma (Control)and service quality at significant level ($\alpha \leq 0.05$), and the results in table No.(5.23) which show that the correlation coefficient for all service quality fields equal 0.560 > Critical value = 0.298, and p-value equal 0.000 < 0.05, that means there is a correlation between Lean Six Sigma (Control) and service quality at significant level ($\alpha \leq 0.05$).

Table No .(5.23)illustrated there is relation between the fifth dimension of Lean Six Sigma and service quality. The last phase is controlling, providing staff management with the outputs of processes that reflect the needs of patients and evaluating performance of employees , to ensure the achieved results are sustained. Regular controlling keep processes distinct. Consistent with(Ramez,2012)which clarified that managers and doctors should build cultural values, renew the operational system and recruit qualified managerial and medical staff to offer an excellent and constant level of service quality over time.

Table (5.23): A correlation between the fifth dimension of Lean Six Sigma(Control) and Service Quality at significant level($\alpha \leq 0.05$)

Section	Statistic	Tangibles	Reliability	Responsiveness	Assurance	Empathy	All dimensions of(ServiceQuality)
Control	Pearson Correlation	0.321*	0.530**	0.375*	0.579**	0.366*	0.560**
	P-value	0.036	0.000	0.013	0.000	0.016	0.000
	N	43	43	43	43	43	43

H1: There is statistical significant relationship between Lean Six Sigma Dimensions and Service Quality at significant level ($\alpha \leq 0.05$) in physiotherapy units .

To illustrated the relation between (LSS) dimensions and quality service ,Pearson correlation test procedure was used to test the correlation between (LSS) Dimensions and service quality at significant level ($\alpha \leq 0.05$) , and the results in table No.(5.24) which showed that the correlation coefficient for all Quality Service fields 0.736 > Critical value = 0.298, and p-value equal 0.000 < 0.05, mean that there is a correlation between lean Six Sigma Dimensions and service quality at significant level ($\alpha \leq 0.05$).

Table (5.24) illustrated that the results indicated an agreement from all employees about the relations between (LSS)dimensions and quality service. Practices of the (LSS) dimensions are found in P.T service. This result agreed with (Noor, El- naaemyet al, 2012),(Bhat, Gijo, & Jnanesh,2016),(Abuosi & Atinga, 2013), 8.(Eshawi, 2014),(Nayar , Ojhaet al, 2016),(Burgess& Radnor,2013)which concluded that quality and excellent services are found in the hospitals using six sigma .Also(Huddle ,Tirabasset al, 2016)added that application (LSS) improve process quality. Arafeh(2016)and(Vesna& Branislav, 2016) found that there is appositive implication of (DMAIC)on quality services. But (Bucci et al ,2016) argued with this result that explored the critical failure factors of LSS and discuss the top failure factors from different angles.

Table (5.24): A correlation between lean Six Sigma Dimensions and Service Quality at significant level (α ≤ 0.05)

Section	Statistic	Tangibles	Reliability	Responsiveness	Assurance	Empathy	All dimensions of (Service Quality)
Lean Six Sigma Dimensions	Pearson Correlation	0.411**	.703**0	.498**0	.727**0	.521**0	0.736**
	P-value	0.006	0.000	0.001	0.000	0.000	0.000
	N	43	43	43	43	43	43

H2: There is statistical significant impact at (α ≤ 0.05) of lean Six Sigma Dimensions on Service Quality.

To test this hypothesis Multiple linear regression attempts to model the relationship between two or more explanatory variables and a response variable by fitting a linear equation to observed data. Every value of the independent variable *x* is associated with a value of the dependent variable *y*. The population regression line for *p* explanatory variables $x_1, x_2, \ldots, x_p$ is defined to be $\mu_y = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \ldots + \beta_p x_p$. This line describes how the mean response μ_y changes with the explanatory variables. The observed values for *y* vary about their means μ_y and are assumed to have the same standard deviation σ. The fitted values b0, b1, ..., bp estimate the parameters β_0, β_1, ..., β_p of the population regression line.

Since the observed values for y vary about their means μ_y, the multiple regression model includes a term for this variation. In words, the model is expressed as DATA = FIT + RESIDUAL, where the "FIT" term represents the expression $\beta_0 + \beta_1 x1 + \beta_2 x2 + \ldots \beta_p xp$. The "RESIDUAL" term represents the deviations of the observed values y from their means μ_y, which are normally distributed with mean 0 and variance σ. The notation for the model deviations is ε.

Formally, the model for multiple linear regression, given n observations, is $yi = \beta_0 + \beta_1 xi1 + \beta_2 xi2 + \ldots \beta_p xip + \varepsilon_i$ for i = 1,2, ... n.

In the least-squares model, the best-fitting line for the observed data is calculated by minimizing the sum of the squares of the vertical deviations from each data point to the line (if a point lies on the fitted line exactly, then its vertical deviation is 0).

Because the deviations are first squared, then summed, there are no cancellations between positive and negative values. The least-squares estimates b0, b1, ... bp are usually computed by statistical software such SPSS Program. The model is multiple linear regression , and the variable used in the model as follows:

Dependent variable: Service Quality

The researcher considered independent variable lean Six Sigma Dimensions (Define, Measure, analyze, Improve ,control) as (x1 , x2, … , x5).The researcher considered Y = service quality as dependent variable (response variable). Independent variable (explanatory variables) and the results in table No.(5.25) showed that the value of F statistics =10.295, and the p-value = 0.000 < 0.05, so the regression equation is good for predicting. And the significant variables are (Improvement phase) since the T value = 2.413, and p-value 0.021 < 0.05, the remainder variables are not significant . And the result show that the value of Adjusted R-squared =0.525 that means the change in the response variables depend on the explanatory variable Adjusted R-squared =0.525%this result indicated that the dependent variables depended on independent variable with Adjusted R-squared =0.525% and the residual effect to another variables not included in the study. That means any change at (LSS) dimension, leads to service quality response .

The multiple linear regression Formula is

Y = 2.351 + 0.053 x1 - 0.047 x2 + 0.108×x3 0.322 x4 + 0.039 x5

Table(5.25)showed the result of Multiple linear regression: All the independent variable(LSS) dimension affect the quality service with ratio52.5%and p-value = 0.000 < 0.05.The multiple linear regression Formula that's indicates that the variables X1(Define),X3(Analyze),X4(Improvement) ,X5(control) have Positive relationship between (LSS)dimension and service quality and the X2(Measure) has Inverse relationship.

All variables together have impact on service quality as the P.T service is applied in practical way according to rules and scientific procedure more than measuring data. .So this dimensions affect the service quality together but there is may on dimension is more significant. Consistent with(Rezek, 2016) which concluded that there is an effect

in implementation (SS) approach in the manufacturing strategy. And corresponded (Salman, 2013)which indicated that the quality level of the university services, as it is recognized by Al Aqsa University students, was low and medium in all the domains. In general the correlation is relatively weak but the is impact from (LSS)dimensions on service quality. Finally the table showed the most significant dimension is (Improve) as the p-value is <0.05.

Table (5.25): Multiple regression analysis (Dependent Variable: Service Quality)

Independent variables	Unstandardized Coefficients		Standardized Coefficients	t value	p-value
	B	Std. Error	Beta		
Constant	2.351	0.469		5.012	0.000
Define	0.053	0.126	0.084	0.420	0.677
Measure	-0.047	0.195	-0.056	-0.242	0.810
Analyze	0.108	0.144	0.147	0.752	0.457
Improve	0.322	0.133	0.571	2.413	0.021
Control	0.039	0.091	0.068	0.435	0.666
F =10.295		**P-Value = 0.000**		**Adjusted R-squared =0.525**	

Stepwise regression methods

Our model is multiple linear regression , and the variable used in the model as follows:

- Dependent variable: Service Quality.
- independent variables – lean Six Sigma Dimensions (Define , Measure, Analyze , Improve, Control)

The Stepwise regression methods and the results as follows:

Table (5.26) show the "Model Summary" which gives details of the overall correlation between the independent variables and the dependent variable. Which show that R=0.753, R Square = 0.568 , and Adjusted R Square = 0.557, that mean the dependent variable depend on the independent variable with percent 55.7%.

Table (5.26): Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.753[a]	.568	.557	.29376

a. Predictors: (Constant), dimension of (Improve) phase

Table (5.26):) show the ANOVA results which show that the value of F test = 53.808, P-Value = 0.000 < 0.05 means that at least one variable of independent variable has an effect on the dependent variable (Service Quality).

This procedure analyzes the dimensions of the independent variables separately and showed that the more significant variable is the dimension of (improvement)phase regarding this result to the approval from employees on focusing on the process and try to find solution if any problems happens. Consistent with (Sabry, 2014)which conclude that the literature reviews still debate on the application of CSFs of six-sigma quality program in the healthcare sector and didn't agree on a universal complete uniform construct to measure the performance in health sector. Also consistent with(Vesna& Branislav, 2016)Lean Six Sigma methodology application through DMAIC application will lately enable better employees' performance .

Table (5.27):ANOVA

a. Dependent Variable: Service Quality

b. Predictors: (Constant), (Improve) .

Model		Sum of Squares	df	Mean Square	F	Sig.
1	**Regression**	4.643	1	4.643	53.808	.000[b]
	Residual	3.538	41	.086		
	Total	**8.181**	**42**			

Table (5.27)showed the linear regression equation coefficients for the various model variables. The "B" values are the coefficients for each variable, that is, they are the value which the variables' data should be multiplied by in the final linear equation. The "Constant" is the intercept equilivant in the equation (i.e. the equation would be y = constant + (v1 x coeff1) + (v2 x coeff2) + ...). The Significance (Sig.) figures should be 0.05 or below to be significant at 95 percent. A value of .000 means the figure is too

small for three decimal place representation. The only significant independent variable is (Improvement phase) where t = 7.335, and P-Value = 0.000< 0.05.

Table (5.27)showed that all independent variables(LSS) together has an impact on the dependent variables (service quality) as P-Value = 0.000< 0.05.but when take the

independent variable separately the only significant independent variable is (Improvement phase) where t = 7.335, and P-Value = 0.000< 0.05.consistent with Abdulla(2012)which illustrated that significant relationship between the obligations of banks operating in the Gaza Strip, the standards approach (SS) quality control and internal audit at the level of significance ($\alpha \leq 0.05$).Also(Zoarb, 2012)concluded that applying (SS) will contributes and allows the entities to improve services quality and saving the cost of services.

The linear regression model is

a- (Service Quality) = 2.565 + 0.424× (Improve) .

Table (5.28): Excluded Variables

Dimensions		Beta In	t	Sig.	Partial Correlation	Collinearity Statistics
						Tolerance
1	**Define**	.092[b]	.624	.536	.098	.490
	Measure	.025[b]	.146	.885	.023	.368
	Analyze	.152[b]	.839	.407	.131	.322
	Control	.100[b]	.719	.476	.113	.551

a. Dependent Variable: Service Quality

b-Predictors in the Model: (Constant), Improvement phase

Table (5.28) show the "Excluded Variables" means variables removed from the model because it's not affected in the dependent variable (Service Quality) , and that variable are (Define , Measure, Analyze , Control) where the P-value for each variable > 0.05. They didn't affect the service quality alone but the Improve variables is more significant variable on service quality. While the Improvement phase where the P-value<0.05 was the Coefficients .that means the quality is affected by (LSS) dimensions through the Improvement phase. Consistent with (Arafeh,2016)which explained quality tools, such as cause and effect diagrams and quality function deployment, have been successfully applied within the Six Sigma DMAIC framework in the educational sector

to improve the performance of students. Jawada(2011)concluded that there is an approval from the senior management that the application of Six Sigma has an impact on improving the quality of health services according to the optimistic expectations of senior management about the impact of this application

H3. : There are statistical significant differences at ($\alpha \leq 0.05$) in the responses of the research sample related to the dimensions of Lean Six Sigma due to the personal characteristics of the employees (gender, age, Career Level, Years' experience).

And this hypothesis divided into sub-hypotheses as follows:

H3.1: - There are a statistical significant differences at ($\alpha \leq 0.05$) in the responses of the research sample related to the dimensions of Lean Six Sigma due to gender.

To test this hypothesis the independent sample T test procedure was used and the result explained in table (5.29) which showed that the p-value for all fields equal 0.991 > 0.05 , and the absolute value of $T_{stat} = 0.012 < T_{critical} = 2.02$. That means there is no statistically significant differences in the responses of the research sample about dimension lean six sigma due to gender.

Table No.(5.29) illustrated that there are no statistically significant differences in the responses of the research sample about Lean Six Sigma dimensions due to gender. That means the work of physiotherapy is practiced at UNRWA according to UNRWA rules and instruction .No differentiation between male and female. So the work should be in the same consistent (Abdulla,2012)and (Jwada ,2011).

Daraweesh(2015)corresponded with this result, which concluded there are no differences at the level of significance due to gender .

Table (5.29): independent sample t test for differences in the responses of the research sample related to the dimensions of Lean Six Sigma due to gender

dimensions	Gender	N	Mean	Std. Deviation	T	P-value
Define	Male	22	4.10	0.704	0.515	0.609
	Female	21	3.99	0.705		
Measure	Male	22	4.37	0.519	-0.157	0.876
	Female	21	4.40	0.546		
Analyze	Male	22	4.41	0.646	-0.002	0.998
	Female	21	4.41	0.564		
Improve	Male	22	3.95	0.863	-0.302	0.764
	Female	21	4.03	0.711		
Control	Male	22	3.49	0.771	-0.032	0.975
	Female	21	3.50	0.780		
All dimensions	Male	22	4.05	0.632	0.012	0.991
	Female	21	4.05	0.561		

H3.2: There are a statistical significant differences($\alpha \leq 0.05$) in the responses of the research sample related to the dimensions of Lean Six Sigma due to Career Level.

To test this hypothesis the independent sample T test procedure was used and the result illustrated in table no.(5.30) which show that the p-value for all fields equal 0.282 > 0.05 , and the absolute value of $T_{stat} = 1.089 < T_{critical} = 2.02$, that means there are no statistically significant differences in the responses of the research sample about Lean Six Sigma dimensions due to Career Level.

Table No. (5.30) illustrated no statistically significant differences in the responses of the research sample about dimension lean six sigma due to Career level that's means clinical instruction is the same for both physiotherapy and physiotherapy assistance also UNRWA policy, rules, and goals are same for the all Career level. consistent with(Abdullah,2012) which concluded that there are no statistically significant differences at the level of significance($\alpha \leq 0.05$)to scientific certificates about internal audit. El Qassas(2013)also concluded that there are no statistically significant differences at the level of significance ($\alpha \leq 0.05$)to management support applying Six Sigma in the commercial banks due the qualifications. While disagree with (Jwada ,2011)which conducted that there is difference in the study targeted response due to

career level as the top management was targeted and little employees have these positions. Darawesh(2015)corresponded the same result that no difference due to Career Level.

Table (5.30): independent sample t test for differences in the responses of the research sample about Lean Six Sigma dimensions due to Career Level

dimensions	Career Level	N	Mean	Std. Deviation	T	P-value
Define	Physiotherapist	22	3.97	0.731	-0.724	0.473
	Assistant Physiotherapist	21	4.13	0.671		
Measure	Physiotherapist	22	4.33	0.555	-0.735	0.467
	Assistant Physiotherapist	21	4.44	0.501		
Analyze	Physiotherapist	22	4.25	0.668	-1.775	0.083
	Assistant Physiotherapist	21	4.57	0.483		
Improve	Physiotherapist	22	3.86	0.867	-1.084	0.285
	Assistant Physiotherapist	21	4.12	0.683		
Control	Physiotherapist	22	3.42	0.865	-0.625	0.535
	Assistant Physiotherapist	21	3.57	0.659		
All dimensions	Physiotherapist	22	3.96	0.662	-1.089	0.282
	Assistant Physiotherapist	21	4.15	0.504		

H3.3: -There are statistical significant differences at ($\alpha \leq 0.05$) in the responses of the research sample related to the dimensions of Lean Six Sigma due to age.

To test this hypothesis the one way ANOVA procedure was used and the result illustrated in table no.(5.31) which show that the p-value = 0.393 > 0.05 , and the value of $F_{stat} = 1.024 < F_{critical} = 2.58$, that means There are no statistically significant differences at the level of $\boldsymbol{\alpha \leq 0.05}$in the responses of the research sample about dimension lean six sigma due to age.

Table (5.31)illustrate that business is business for all ages no difference. All employees work under the same circumstances of policy and goals of UNRWAwork distributed according to work load and number of patients. Consistent with (Abdullah 2012)which concluded that there were no statistically significant differences between the responses of respondents to age,(Jwada ,2011))and(Daraweesh2015) concluded the same results about age study variable

Table (5.31): One way ANOVA test for differences in the responses of the research sample related to the dimensions of Lean Six Sigma due to age.

Dimensions	Source	Sum of Squares	df	Mean Square	F value	Sig.(P-Value)
Define	Between Groups	1.452	3	0.484	0.992	0.407
	Within Groups	19.033	39	0.488		
	Total	20.485	42			
Measure	Between Groups	1.637	3	0.546	2.127	0.112
	Within Groups	10.004	39	0.257		
	Total	11.641	42			
Analyze	Between Groups	1.224	3	0.408	1.145	0.343
	Within Groups	13.892	39	0.356		
	Total	15.116	42			
Improve	Between Groups	1.392	3	0.464	0.741	0.534
	Within Groups	24.420	39	0.626		
	Total	25.812	42			
Control	Between Groups	0.897	3	0.299	0.491	0.690
	Within Groups	23.741	39	0.609		
	Total	24.638	42			
All dimensions	Between Groups	1.072	3	0.357	1.024	0.393
	Within Groups	13.613	39	0.349		
	Total	14.685	42			

*Critical value of F at df "3,39 " and significance level 0.05 equal 2.85

H3.4: There are a statistical significant differences at ($\alpha \leq 0.05$) in the responses of the research sample related to the dimensions of Lean Six Sigma due to Years' experience.

To test this hypothesis one way ANOVA procedure was used and the result illustrated in table no.(5.32) which show that the p-value 0.826 > 0.05 , and the value of F_{stat} =0.299 < $F_{critical}$ =2.85, that means There are no statistically significant differences at the level of $\alpha = 0.05$ in the responses of the research sample about Lean Six Sigma dimensions due to Years' experience.

Table.(5.32) illustrated that there is no statistically significant differences at the level of ($\alpha = 0.05$) in the responses of the research sample about dimension lean six sigma due to Years of experience. Due to protocol of P.T has been found in all units. Which mains that work acted with same criteria consistent with(Abdullah,2012),(Dareweesh,2015) and (Jwada,2011)which concluded that ne

difference in the response of study this variable. The result of this hypothesis at the line with age hypothesis.

Table (5.32): One way ANOVA test for differences in the responses of the research sample related to the dimensions of Lean Six Sigma due to Years' experience

Dimensions	Source	Sum of Squares	df	Mean Square	F value	Sig.(P-Value)
Define	Between Groups	0.11	3	0.038	0.073	0.974
	Within Groups	20.37	39	0.522		
	Total	20.49	42			
Measure	Between Groups	0.49	3	0.163	0.569	0.639
	Within Groups	11.15	39	0.286		
	Total	11.64	42			
Analyze	Between Groups	0.83	3	0.275	0.751	0.528
	Within Groups	14.29	39	0.366		
	Total	15.12	42			
Improve	Between Groups	1.10	3	0.367	0.579	0.632
	Within Groups	24.71	39	0.634		
	Total	25.81	42			
Control	Between Groups	1.06	3	0.354	0.586	0.628
	Within Groups	23.58	39	0.605		
	Total	24.64	42			
All dimensions	Between Groups	0.33	3	0.110	0.299	0.826
	Within Groups	14.36	39	0.368		
	Total	14.68	42			

*Critical value of F at df "3,39 " and significance level 0.05 equal 2.85

H4. : There are statistical significant differences at ($\alpha \leq 0.05$) in the responses of the research sample about service quality due to the personal characteristics of the employees (gender, age, Career Level, Years' experience And this hypothesis divided into sub-hypotheses as follows:

H4.1 : - There are statistical significant differences at ($\alpha \leq 0.05$) in the responses of the research sample about Service Quality due to gender.

To test the hypothesis the independent sample T test was used and the result illustrated in table no.(5.33) which show that the p-value for all fields equal 0.407 > 0.05 , and the absolute value of $T_{stat} = 0.837 < T_{critical} = 2.02$, that means there are no statistically significant differences in the responses of the research sample about service quality due to gender. The quality conception was understood by all employees males and females who work under UNRWA umbrella, no differentiation of both gender.

consistent with (Abdullah,2012)which illustrate that There are no statistically significant differences at the level of significance activities of internal audit work, planning and implementation of the internal audit . Jawada(2011)indicated this results about age variable. Bouguedjani and Al Dmouret (2012) also concluded that there is no difference of study sample to age variable .other studied concluded the effect of (TQM) on physical intervention like (Gharibi, Tabrizi, et al, 2014).Contrariwise (Salman,2013)indicated that there is significant differences attributed to the gender at level of quality of university services .

Table(5.33): independent sample t test for differences in the responses of the research sample about Service Quality due to gender

Dimensions	Gender	N	Mean	Std. Deviation	T	P-value
Tangibles	Male	22	3.92	0.534	0.948	0.349
	Female	21	3.77	0.482		
Reliability	Male	22	4.48	0.558	0.686	0.497
	Female	21	4.35	0.672		
Responsiveness	Male	22	4.35	0.701	0.471	0.640
	Female	21	4.25	0.614		
Assurance	Male	22	4.53	0.669	0.722	0.475
	Female	21	4.40	0.497		
Empathy	Male	22	4.44	0.481	0.246	0.807
	Female	21	4.40	0.539		
All dimensions	Male	22	4.31	0.464	0.837	0.407
	Female	21	4.20	0.420		

H4.2: There are a statistical significant differences at ($\alpha \leq 0.05$) in the responses of the research sample about Service Quality due to Career Level

To test the hypothesis we use the independent sample T test and the result illustrated in table No.(5.34) which show that the p-value for all fields equal 0.530 > 0.05 , and the absolute value of T_{stat} =0.634 < $T_{critical}$ = 2.02 . That means there are no statistically significant differences in the responses of the research sample about service quality due to Career Level.

Table (5.34) showed that no statically significant differences in the responses of the research sample about service quality due to Career Level .all employees worked with quality concept output the same for all career Level. Consistent with (Jwada ,2011)which concluded that no difference about service quality due to this career level

but disagreed with (Abdullah,2012) which indicated difference due to career level. UNRWA try with the employee to keep accepted quality and maximize patient satisfaction .Eshawi(2014)and (Lau, Cheung,& Lam et al, 2013)clarified that Six sigma method, the most technique to achieve Total Quality Management but didn't take consideration to career level variable.

Table (5.34): Independent sample t test for differences in the responses of the research sample about Service Quality due to Career Level

Dimension	Career Level	N	Mean	Std. Deviation	T	P-value
Define	Physiotherapist	22	3.85	0.527	0.046	0.964
	Assistant Physiotherapist	21	3.84	0.501		
Measure	Physiotherapist	22	4.38	0.780	-0.399	0.692
	Assistant Physiotherapist	21	4.46	0.380		
Analyze	Physiotherapist	22	4.15	0.782	-1.575	0.123
	Assistant Physiotherapist	21	4.46	0.453		
Improve	Physiotherapist	22	4.39	0.714	-0.964	0.341
	Assistant Physiotherapist	21	4.56	0.418		
Control	Physiotherapist	22	4.43	0.536	0.097	0.923
	Assistant Physiotherapist	21	4.42	0.483		
All dimensions	Physiotherapist	22	4.21	0.522	-0.634	0.530
	Assistant Physiotherapist	21	4.30	0.345		

H4.3: -There are a statistical significant differences at ($\alpha \leq 0.05$) in the responses of the research sample about Service Quality due to age.

To test the hypothesis one way ANOVA procedure was used. And the result illustrated in table (5.35) which showed that the p-value equal 0.577 > 0.05 , and the value of $F_{stat} = 0.668 < F_{critical} = 2.85$, that means there are no statistically significant differences at the level of $\alpha = 0.05$ in the responses of the research sample about service quality due to age.

Regarded this result to same work load on all employees no difference between ages also all employees like to have excellent performance. That lied at the same line of (Abdullah,2012),(Jwada,2011 and Daraweesh,2015)which clarified that no differences between age variable and quality service .Ramez(2012)clarify the level of quality

service in the health care and patient satisfaction but didn't take the age variable of study sample in consideration .Al Bahi(2016) indicated that there is impact of quality service on customers' satisfaction. While (Zoarb, 2012) concluded that how the usage of (SS)save quality cost but didn't take the age variable of study sample with consideration.

Table (5.35): One way ANOVA test for differences in the responses of the research sample about Service Quality due to age.

Field	Source	Sum of Squares	df	Mean Square	F value	Sig.(P-Value)
Tangibles	Between Groups	0.472	3	0.157	0.592	0.624
	Within Groups	10.383	39	0.266		
	Total	**10.855**	**42**			
Reliability	Between Groups	1.437	3	0.479	1.305	0.286
	Within Groups	14.309	39	0.367		
	Total	**15.745**	**42**			
Responsiveness	Between Groups	1.195	3	0.398	0.927	0.437
	Within Groups	16.763	39	0.430		
	Total	**17.959**	**42**			
Assurance	Between Groups	0.654	3	0.218	0.613	0.611
	Within Groups	13.872	39	0.356		
	Total	**14.526**	**42**			
Empathy	Between Groups	0.535	3	0.178	0.685	0.566
	Within Groups	10.157	39	0.260		
	Total	**10.692**	**42**			
All dimensions	Between Groups	0.400	3	0.133	0.668	0.577
	Within Groups	7.781	39	0.200		
	Total	**8.181**	**42**			

Critical value of F at df "3,39 " and significance level 0.05 equal 2.85

H4.4:- There are a statistical significant difference at ($\alpha \leq 0.05$) in the responses of the research sample about Service Quality due to Years' experience.

To test the hypothesis one way ANOVA procedure was used and the result illustrated in table no.(5.36) which show that the p-value equal 0.288 > 0.05 , and the value of $F_{stat} = 1.300 < F_{critical} = 2.85$, that means There are no statistically significant differences at the level of $\alpha = 0.05$ in the responses of the research sample about service

quality due to Years' experience .As physiotherapy rules and the protocol is clear for all employees

Also all units work in the same way, same supervision, and work as team work no distinct to years' experience .corresponded with (Abdulla,2012), (Jawada, 2011)which conclude that there is no difference of study sample to career level variable. In other hands (Zoarob, 2012),(Sulieman ,2013)and (Basher, 2017)indicated that there is approval from study sample about positive relation between quality and (SS)application and didn't take the career variable. But disagreed with(Bouguedjani and AlDmour,2012)which indicated that there is difference about quality services due to career variable. The conception of quality is the same for new employees as the same with the old employees regarding this results to UNRWA competencies' which is clear for all staff.

Table (5.36):One way ANOVA test for differences in the responses of the research sample about Service Quality due to Years' experience.

Dimensions	Source	Sum of Squares	df	Mean Square	F value	Sig.(P-Value)
Tangibles	Between Groups	0.11	3	0.038	0.137	0.937
	Within Groups	10.74	39	0.275		
	Total	10.86	42			
Reliability	Between Groups	0.85	3	0.284	0.744	0.532
	Within Groups	14.89	39	0.382		
	Total	15.75	42			
Responsiveness	Between Groups	2.82	3	0.941	2.425	0.080
	Within Groups	15.14	39	0.388		
	Total	17.96	42			
Assurance	Between Groups	1.22	3	0.407	1.193	0.325
	Within Groups	13.31	39	0.341		
	Total	14.53	42			
Empathy	Between Groups	1.47	3	0.491	2.075	0.119
	Within Groups	9.22	39	0.236		
	Total	10.69	42			
All dimensions	Between Groups	0.74	3	0.248	1.300	0.288
	Within Groups	7.44	39	0.191		
	Total	8.18	42			

*Critical value of F at df "3,39 " and significance level 0.05 equal 2.85

Chapter 6
Conclusions and Recommendations

Chapter 6
Conclusions and Recommendations

6.1 Introduction

This chapter concludes the results and findings of the study, and it also provides recommendations and future research ideas.

6.2 The main conclusions and findings:

- Lean Six Sigma Dimensions are applied in UNWRA health centers -Gaza Strip at significance level ($\alpha \leq 0.05$) with weight mean equal of "81%" as practices, but Lean Six Sigma as approach is not clear to employees yet.
- The level of six sigma in Physiotherapy units is the second level as the quality with weight mean equal of "89%". This level lies between the second level of quality with weight mean equal of "69%" and the third level with weight mean equal of (93%).
- Service quality n UNWRA health centers - Gaza Strip has provided at significance level ($\alpha \leq 0.05$) with weight mean equal of"89%" which means patients were satisfy to their services.
- There is an impact of lean six sigma dimensions on service quality in physiotherapy units.
- There are no statistically significant differences in the responses of the research sample about lean six sigma dimension due to respondents characteristics (age-gender-career level years' experience).
- There are no statistically significant differences in the responses of the research sample about quality service due to respondents characteristics (age-gender-career level years' experience).
- Lack of moral or physical incentives, leads the employees to be more frustrated.
- The units aren't provided with special needs equipment's for handicaps patients.
- Some units do not have suitable waiting rooms for patients.
- There is a lack of bulletins or educational and health materials.
- The units are not prepared enough for handicap patients.

6.3. Recommendations:

6.3.1. The study concluded the following recommendations:

- Application of Lean Six Sigma should be as practices and approach among physiotherapy units in UNRWA Health Centers.
- The management of UNRWA should keep attention on employees' training after performance evaluation according to output.
- There should be more attention to connect the best performance with the moral or physical incentives.
- The units should have a suitable waiting rooms for patients.
- Bulletins or educational and Health materials should be produced and published.
- Units need special needs for handicaps patients .
- The employees should be involved in the new projects.
- Employees need empowerment and professional development.
- Further research on quality service and patients satisfaction are encouraged.
- Collaboration between the human resources and the health department should be enhanced.

6.4 Further Studies:

After the researcher has finished the research, she recommends further studies on:

1. Lean Six Sigma approach application feasibility in other sectors of health care at UNRWA health centers.
2. The relationship between Lean Six Sigma and service quality in physiotherapy in Gaza Strip.
3. Awareness of employees at UNRWA health centers about Lean Six Sigma approach and its impact on services quality.

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Appendix

Appendix

Appendix (A): Judgment Committee

اسم المحكم	مكان العمل	المسمى الوظيفي
د. خالد دهليز	الجامعة الاسلامية	أستاذ مساعد
د. نبيل اللوح	أكاديمية الإدارة والسياسة	أستاذ مساعد
د. خليل ماضي	جامعة الأزهر	أستاذ مساعد
د. إبراهيم أبو رحمة	جامعة غزة	أستاذ مساعد
د. آمال عبدالقادر الحيلة	كلية فلسطين التقنية	أستاذ مساعد
د. فرج أبو رية	الأونروا	رئيس أقسام العلاج الطبيعي في الأنروا
أ.د. جبر الداعور	جامعة الأزهر	أستاذ مشارك

لائحة للمرضي

عزيزي المراجع /المراجعة:تحية طيبة..... وبعد:

هذه الاستبانة أداة لجمع البيانات اللازمة لإجراء دراسة بعنوان تقييم خدمة العلاج الطبيعي المقدمة في المراكز الصحية بوكالة الغوث الدولية بقطاع غزة الرجاء منكم التكرم بالإجابة على جميع فقرات الاستبيان لما له من أهمية بالغة لإنجاح هذه الدراسة مع العلم بأن هذه المعلومات ستتعامل معها الباحثة بسرية تامة وتستخدم لأغراض البحث العلمي. وشكرا لحسن تعاونكم .

- يسهل الوصول للعيادة.
- تتوفر لوحات ارشادية واضحة تسهل الوصول للأقسام.
- توفر الأقسام نشرات أو ماد تثقيفية وصحية بداخلها.
- تتوفر صالات انتظار ملائمة ونظيفة.
- يتم احترام القواعد والأنظمة داخل الأقسام (ممنوع التدخين –التزام الهدوء–والنظام).
- يتلاءم المركز مع ذوي الحاجات الخاصة.
- مستوي النظافة في الأقسام مقبول.
- مستوي الهدوء والنظام(التزام العاملون بالنظام–العمل داخل الأقسام).
- تعمل الأقسام بنظام الحجز المسبق.
- يتوفر لدي الأقسام عدد كافي من الأسرة.
- يقوم العاملون في الأقسام بفحص المريض فحصا كاملا في أول جلسة.
- أنت راض عن مستوي الخدمة المقدمة.
- الفترة الزمنية للحصول على الخدمة مناسبة.
- يراعي العاملون في الأقسام الخصوصيةأثناء الكشف السريري.
- العاملون في الأقسام يتعاملون معك بصورة لائقة.

الباحثة:نبيلة أبو شرخ.

Appendix (B): Questionnaire

Personal and functional data :

1	**Gender**	male ☐	female ☐
2	**Age**	< 25 years ☐ From 25 to < 30 years ☐	From 30 to <45 years ☐ 45 >
3	**Career Level**	Physiotherapist ☐	Assistant Physiotherapist ☐
4	**Years of Experience**	< 5 Years ☐ From 5 to < 10 years ☐	From 10 to < 15 years ☐ < 15 years
5	**Governorate**	Gaza ☐ North of Gazastrip ☐	The middle of Gaza strip ☐ Khan Younes ☐ Rafah

Part 1

1. The first Approach: Define

in this phase it would be clear how the problem will be identify.:

No.	Paragraph	strongly agree	Agree	Neutral	Disagree	Strongly Disagree
1	Team work is done within physiotherapy units when a problem occurs .					
2	A team leader is chosen according to a specific criterion that has the ability to solve problems skillfully					
3	A roadmap for the work is developed (a protocol - instructions) that is referred to when any problem occurs within the departments.					
4	A draft describes the problem and its dimensions					
5	Problems are identified accurately when they occur.					
6	There is feedback when any problem occurs					
7	Employees are involved in the selection of new projects (introduction of the health system)					

2. Measurement phase (measurement)

The logical trace is to identify the problems faced by employees

no	Paragraph	strongly agree	Agree	Neutral	Disagree	Strongly Disagree
1	Data is collected regularly and easily within physiotherapy units					
2	The facts and figures are checked when any problem occurs in physiotherapy units correctly.					
3	Inputs are measured for intra-departmental processes (such as reception of new patients)					
4	Outputs are measured for intra-units processes (such as patients' satisfaction with the service provided / patient complaint / liability determination)					
5	Patient data is recorded and their files are monitored on a daily basis					
6	A preliminary report is drawn up on the problems faced by workers and patients after challenging them and trying to solve them					

3. Phase Analyze

This phase analyzes the data collected in the previous phase

No.	Paragraph	strongly agree	Agree	Neutral	Disagree	Strongly Disagree
1	the data are analyzed in an appropriate statistical manner when any problem occurs within physiotherapy units					
2	Patient and file data are documented correctly					
3	Data is easily referenced when needed					
4	Statistical methods are used to make reports on daily work					
5	Usage of descriptive methods for data storage and archiving					

4. Improvement phase: (Improve)

At this stage, focus is placed on the targeted operations and application of appropriate solutions to achieve quality in the services provided and improve performance

No.	Paragraph	strongly agree	Agree	Neutral	Disagree	Strongly Disagree
1	Alternatives are developed after identifying the root causes of the problems					
2	A regular feedback of the workflow is taken					
3	The protocol of physiotherapy is referred to, when any problem occurs					
4	Employees are involved at all levels					

No.	Paragraph	strongly agree	Agree	Neutral	Disagree	Strongly Disagree
5	The protocol is amended based on a deeper understanding of the problems that may occur					
6	Work within a structured and always clear framework					
7	Employees accept any change in work methods easily					

5. Control

The objective of this phase is to monitor and maintain improved processes

No.	Paragraph	strongly agree	Agree	Neutral	Disagree	Strongly disagree
1	Employees are evaluated continuously by the officials					
2	Solutions are developed for problems that may occur after the evaluation process					
3	The staff are evaluated within specific criteria					
4	Employees Provide management with the outputs of processes that reflect the needs of patients					
5	The performance of the staff is improved based on the evaluation outputs					
6	Performance is linked to physical or moral incentives					

The second part: Service Quality

No.	paragraph	strongly agree	Agree	Neutral	Disagree	Strongly disagree
The first : (Tangibility)						
1	The units provides the material needs and within the available resources					
2	Quality goals are known to employees					
3	I think the cost of quality is low and achievable					
4	I believe that quality can be achieved without the use of advanced equipment and technology					
5	There is a waiting room for patients and offices of workers within each section					
6	The staff in the units have an elegant appearance and are fully formalized					
Second: (Reliability)						
1	units are committed to their promises to patients in the provision of therapeutic services provided					
2	The staff members sympathize with the patients when they complain about the level of service provided					
3	The patients develop their confidence in the workers and in the quality of service provided to them					
4	The staff in the PTunits are interested in recording information about patients and their health condition					
5	Patients get service easily					
Thirdly : (Responsiveness)						
1	The patients are informed about the times of the					

No.	paragraph	strongly agree	Agree	Neutral	Disagree	Strongly disagree
	sessions and the coordination of their dates					
2	The service is provided immediately to patients					
3	The workers respond quickly to the requests of patients despite their busy					
Fourthly : (Assurance)						
1	The patients trust the employees with great confidence					
2	reassures the patient that he is in good hands					
3	The employees treat the patients with elegance					
4	Employees have merit, courtesy and credibility					
Fifthly : Empathy						
1	units are concerned with the personal care of patients					
2	The needs of patients (appointments - days) Appropriate for them)					
3	Working hours are compatible with patients' times					
4	The best service is provided to patients during the treatment period					

Appendix (C): Translated Questionnaire

الزميل الكريم ، الزميلة الكريمة .....تحية طيبة وبعد:-

هذه الاستبانة أداة لجمع البيانات اللازمة لإجراء دراسة بعنوان :

أثر ممارسات(lean six sigma) لين ستة سيجما علي جودة خدمة العلاج الطبيعي بمراكز الرعاية الصحية بوكالة الغوث الدولية في قطاع **غزة**. .

الرجاء منكم التكرم بالإجابة على جميع فقرات الاستبيان لما له من أهمية بالغة لإنجاح هذه الدراسة مع العلم بأن هذه المعلومات ستتعامل معها الباحثة بسرية تامة وتستخدم لأغراض البحث العلمي .وشكرا لحسن تعاونكم

الباحثة:

نبيلة أبو شرخ

مرفق لكم نبذة عن(lean six sigma) منهجية لين ستة سيجما وأهميتها في المجال الصحي

نبذة عن منهجية لين ستة سيجما:

هي منظور إداري جديد في إدارة الجودة الشاملة يهدف للتقليل من الأخطاء في العمل والحفاظ علي سير العمل بطريقة متتابعة وسهلة وهي الطريقة الأذكى لإدارة الأعمال والتي تضع الزبائن في الترتيب الأول وتعتمد على استخدام المعلومات والحقائق من أجل الوصول إلى حلول أفضل من خلال تصميم ومراقبة أنشطة الأعمال اليومية بحيث يتم تقليل الفاقد واستهلاك المصادر وفي نفس الوقت تلبية احتياجات العميل وتحقيق القناعة لديه.يتم تخفيض الخطأ بالعمليات بنسبة٣.٤ لكل مليون فرصة عمل

تعريف الجودة: هي الخلو من العيوب والأخطاء في المنتج التي ترهق العمل والتي تحتاج إلي إعادة إصلاح مما يؤدي لعجم الوصول للأهداف المطلوبة وعدم رضا الزبون.

تعريف جودة الخدمة الطبية: تطبيق جميع أنواع الخدمات الطبية الحديثة، لتلبية احتياجات الناس في حدود التكنولوجيا المتوفرة، والموارد، وظروف المستهلك وتعرف أيضا قياس المستوى الحقيقي للخدمة المقدمة، مع بذل الجهود اللازمة لتحسين مستوي الخدمة.

البيانات الشخصية والوظيفية:

١-	الجنس	☐ ذكر			☐ أنثى	
٢-	العمر	☐ اقل من ٢٥ سنة			☐ من ٢٥ إلى أقل ٣٠ سنة	
		☐ من٣٠ سنوات إلى اقل من ٤٥ سنة			☐ ٤٥ سنة فأكثر	
٣-	المستوي الوظيفي	☐ أخصائي علاج طبيعي			☐ مساعد علاج طبيعي	
٤-	عدد سنوات الخبرة	☐ اقل من ٥ سنوات			☐ من ٥ سنوات إلى اقل من ١٠ سنوات	
		☐ من ١٠ سنوات إلى اقل من ١٥ سنة			☐ ١٥ سنة فأكثر	
٥-	المحافظة	☐ غزة	☐ شمال غزة	☐ الوسطي	☐ خانيونس	☐ رفح

الجزء الأول

١- تعريف المشكلة (Define):

يتم التعرف من خلال هذا المحور علي الطريقة التي يتم بها تحديد أي مشكلة أثناء العمل

الرقم	الفقرة	أوافق بشدة	أوافق	محايد	لا أوافق	لا أوافق بشدة
١	يتم العمل بروح الفريق داخل أقسام العلاج الطبيعي عند حدوث مشكلة في القسم					
٢	يتم اختيار قائد للفريق وفق معيار محدد لديه القدرة علي حل المشاكل بمهارة					
٣	يتم وضع خارطة طريق للعمل بها (برتوكول – تعليمات) يتم الرجوع إليها عند حدوث أي مشكلة داخل الأقسام					
٤	يتم وضع مسودة توضح المشكلة و أبعادها					
٥	يتم تحديد المشاكل بدقة عند حدوثها					
٦	توجد تغذية راجعة عند حدوث أي مشكلة تواجه المرضي					
٧	يتم مشاركة العاملين برأيهم عند اختيار المشاريع الجديدة(إدخال النظام الصحي المحو سب)					

٢ - مرحلة القياس (measure):

يتم التعرف من خلال هذا المحور علي التتبع المنطقي في حل المشاكل التي يواجهها العاملين

الرقم	الفقرة	أوافق بشدة	أوافق	محايد	لا أوافق	لا أوافق بشدة
١	تجمع البيانات بصورة منتظمة وسهلة داخل أقسام العلاج الطبيعي.					
٢	يتم تدقيق الحقائق و الأرقام عند حدوث أي مشكلة بطريقة صحيحة.					
٣	يتم قياس المدخلات للعمليات التي تتم داخل الأقسام(مثل استقبال المرضي الجدد) .					
٤	يتم قياس المخرجات للعمليات التي تتم داخل الأقسام (مثل رضي المرضي عن الخدمة المقدمة/شكوى المرضي/تحديد مسؤولية العاملين)					
٥	تسجل بيانات المرضي ومتابعة ملفاتهم بشكل يومي					
٦	يضع العاملون في اقسام العلاج الطبيعي تقارير أولية للمشاكل التي تواجه العاملين والمرضي بعد تحديها ومحاولة الحل					

٣- مرحلة التحليل(Analyze)

في هذه المرحلة يتم تحليل البيانات التي تم جمعها في المرحلة السابقة

الرقم	الفقرة	أوافق بشدة	أوافق	محايد	لا أوافق	لا أوافق بشدة
١	تحلل البيانات بطريقة إحصائية مناسبة عند حدوث أي مشكلة داخل لأقسام					
٢	يتم توثيق البيانات الخاصة بالمرضي و ملفاتهم بطريقة صحيحة					
٣	يمكن الرجوع للبيانات بسهولة عند الحاجة أليها					
4	تستخدم أساليب إحصائية مناسبة لعمل التقارير المتعلقة بالأعمال اليومية					
5	يتم استخدام أساليب وصفية للبيانات بعد التخزين والأرشفة					

٤- مرحلة التحسين:(Improve)

يتم في هذه المرحلة التركيز علي العمليات المستهدفة وتطبيق الحلول المناسبة لتحقيق جودة في الخدمات المقدمة وتحسين الأداء

الرقم	الفقرة	أوافق بشدة	أوافق	محايد	لا أوافق	لا أوافق بشدة
١	يتم وضع بدائل بعد التعرف علي جذور المشكلات					
٢	يتم أخذ تعدية راجعة عن سير العمل بصورة منتظمة					
٣	يمكن الرجوع للبرتوكول الخاص بالعلاج الطبيعي عند حدوث أي مشكلة					
٤	يتم إشراك العاملين علي اختلاف مستوياتهم					
٥	يتم تعديل البرتوكول بناء علي فهم أعمق للمشاكل التي قد تحدث					
٦	يتم العمل ضمن إطار منظم وواضح دائما					
٧	يتقبل العاملون أي تغيير بطرق العمل بسهولة					

٥- التحكم (control)

الهدف من هذه المرحلة هو مراقبة العمليات المحسنة والمحافظة عليها

الرقم	البيان	أوافق بشدة	أوافق	محايد	لا أوافق	لا أوافق بشدة
١	يتم تقييم العاملين بصور مستمرة من قبل المسؤولين					
٢	يضع المسؤولين حلول للمشاكل التي قد تحدث بعد عملية التقييم					
٣	يتم تقييم العاملين ضمن معايير محددة					
٤	يزود العاملون الإدارة بمخرجات العمليات التي تعبر عن حاجات المرضي					
٥	يتم تحسين أداء العاملين بناء علي مخرجات التقييم					
٦	يتم ربط الأداء بالحوافز المادية أو المعنوية					

الجزء الثاني: جودة الخدمة

الرقم	الفقرة	أوافق بشدة	أوافق	محايد	لا أوافق	لا أوافق بشدة
أولا : الملموسية (Tangibles)						
١	توفر أقسام العلاج الطبيعي المستلزمات المادية وضمن الإمكانيات المتاحة					
٢	أهداف الجودة معروفة لدي العاملين					
٣	أعتقد أن تكاليف الجودة منخفضة ويمكن تحقيقها					
٤	أعتقد أن الجودة يمكن أن تتحقق دون استخدام أجهزة وتكنولوجيا متطورة					
٥	توجد صالة انتظار للمرضي ومكاتب للعاملين داخل كل قسم					
٦	يتمتع العاملون في الأقسام بمظهر أنيق ويلتزمون بالزي الرسمي					

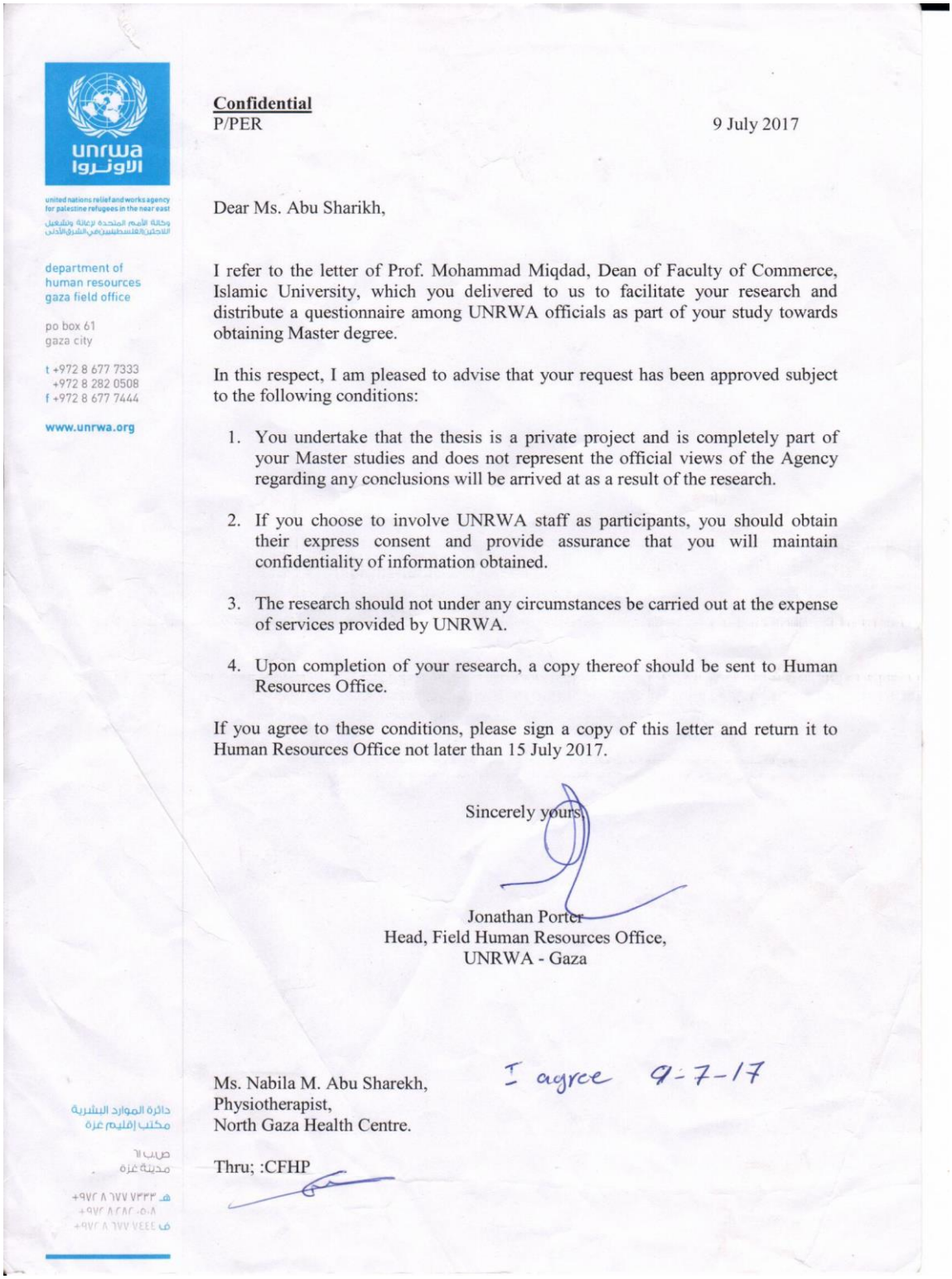
ثانيا : الاعتمادية (Reliability)						
١	تلتزم الأقسام بوعودها للمرضي في مجال تقديم الخدمات العلاجية					
٢	يتعاطف العاملون مع المرضي عند تفد يمهم شكوى عن مستوي الخدمة المقدمة					
٣	يضع المرضي ثقتهم في العاملين وفي جودة الخدمة المقدمة لهم					
٤	يهتم العاملون في الأقسام في تدوين المعلومات عن المرضي وحالتهم الصحية					
٥	يحصل المرضي علي الخدمة بسهولة					

ثالثا :الاستجابة (Responsiveness)						
١	يتم إخبار المرضي عن أوقات الجلسات وتنسيق مواعيدهم					
٢	يتم تقديم الخدمة فورية للمرضي					
٣	يتجاوب العاملون بسرعة لطلبات المرضي رغم انشغالهم					

رابعاً :الثقة(Assurance)						
١	يثق المرضي بالعاملين ثقة كبيرة					
٢	يطمئن المريض بأنه بأيدي أمينة					
٣	يتعامل العاملين مع المرضي بلباقة					
٤	تتوفر لدي العاملين الجدارة والكياسة والمصداقية					

خامساً: التعاطف (Empathy)						
١	تهتم الأقسام بالعناية الشخصية للمرضي					
٢	يتم التعرف علي احتياجات المرضي (المواعيد- الأيام المناسبة لهم)					
٣	تتلاءم ساعات العمل مع أوقات المرضي					
٤	يتم تقديم أفضل خدمة للمرضي خلال فترة العلاج					

Appendix (D):Approval of the work the study at UNRWA



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for palestine refugees in the near east
وكالة الأمم المتحدة لإغاثة وتشغيل
اللاجئين الفلسطينيين في الشرق الأدنى

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f +972 8 677 7444

www.unrwa.org

Confidential
P/PER

9 July 2017

Dear Ms. Abu Sharikh,

I refer to the letter of Prof. Mohammad Miqdad, Dean of Faculty of Commerce, Islamic University, which you delivered to us to facilitate your research and distribute a questionnaire among UNRWA officials as part of your study towards obtaining Master degree.

In this respect, I am pleased to advise that your request has been approved subject to the following conditions:

1. You undertake that the thesis is a private project and is completely part of your Master studies and does not represent the official views of the Agency regarding any conclusions will be arrived at as a result of the research.
2. If you choose to involve UNRWA staff as participants, you should obtain their express consent and provide assurance that you will maintain confidentiality of information obtained.
3. The research should not under any circumstances be carried out at the expense of services provided by UNRWA.
4. Upon completion of your research, a copy thereof should be sent to Human Resources Office.

If you agree to these conditions, please sign a copy of this letter and return it to Human Resources Office not later than 15 July 2017.

Sincerely yours,

Jonathan Porter
Head, Field Human Resources Office,
UNRWA - Gaza

I agree 9-7-17

Ms. Nabila M. Abu Sharekh,
Physiotherapist,
North Gaza Health Centre.

Thru; :CFHP

دائرة الموارد البشرية
مكتب إقليم غزة

ص.ب ٦١
مدينة غزة

هـ ٣٣٣٣ ٧٧٧ ٨ ٩٧٢+
ف ٣٣٤٤ ٧٧٧ ٨ ٩٧٢+