



Sudan University of Science and Technology
College of Graduate Studies
MSc in Quality Management and Excellence



Assessment of Employees Satisfaction using “ISO 9001-2008”

(Case study: - Dental and Oral Health Directorate Ministry of Health Khartoum State)

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(دراسة حالة إدارة صحة الفم الاسنان وزارة الصحة ولاية الخرطوم)

Thesis submitted as complementary fulfillment for the degree of M.SC. In Total
Quality management

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الإستهلال

قَالَ تَعَالَى:

﴿ وَقُلْ أَعْمَلُوا فَسَيَرَى اللَّهُ عَمَلَكُمْ وَرَسُولُهُ وَالْمُؤْمِنُونَ ^ص وَسَتَرُدُّونَ إِلَى

عِلْمِ الْغَيْبِ وَالشَّهَادَةِ فَيُنَبِّئُكُمْ بِمَا كُنْتُمْ تَعْمَلُونَ ﴿١٠٥﴾ ﴾

سورة التوبة الآية - (105)

Dedication

To my family my beloved mother (Alwia Alfadol Mohammed) spirit of my Father (Dr. Mohammed Abdelgader Mohammed) ,my daughter (Rawaa) ,sisters (Naglaa, Omima) brothers (Amr, Ashrf ,Muez, Abdelgder, Ahmed) all friends and colleagues with great thanks and sincere for their support .

Acknowledgment

I would like gratefully to thank Sudan University of Science and Technology, College of Graduate studies, Full Thanks to my Supervisor Prof Hassan Abdel Aziz for his guidance throughout the study, Oral Health Directorate, all employees Oral Health who help me on my Study, also Employee of Quality Center and Excellence Library, Dr. Khalid for his efforts in Statistic analysis, and for any one that helps me in this study.

Abstract

The Purpose of this study to Assess the Implementation of ISO 9001:2008 quality management systems on employee's satisfaction in Oral Health Directorate Ministry of Health Khartoum State. the data were collected through questioner from the dentist, assistant, employees and management of oral health directorate ministry of health Khartoum state, a total of 97 sample were collected, respondents from different Gender (Male, Female), different ages (Less than 30 years, 30-40 years, 40-50 years, 50 years and over), different qualifications (BSc. MSc., PhD., Other), different occupations (Director Manager, Department Director, Head of Department, Other), different experience years (less than 5 years, 5-10 years, 10-15 years, Over than 15 years).

The study revealed that application of ISO and employee satisfaction on chi-square test was (218.06) chi-square, there are statistically significant differences at the level (1%). And also further chi-square test for the relation of application ISO 9001-2008 and continuous improvement health services was (300.05) of chi-square. There are statistically significant differences at the level (1%) among respondents, also found the ISO application reduce of medical errors .Value of chi-square test was (169.65) which is greater than the tabulated value of chi-square, and the significant value level (1%). This reflects presence of strong compliance among dental staff towards the importance of quality system application.

المستخلص

أجريت هذه الدراسة لتقييم تطبيق نظام إدارة الجودة أيزو(2008-9001) علي رضا العاملين بإدارة صحة الفم والاسنان بوزارة الصحة ولاية الخرطوم , تم جمع البيانات عن طريق إستبانات إستهدفت كل من اطباء الأسنان وموظفي إدارة صحة الفم والأسنان بالوزارة , تم جمع 97 عينة عن طريق الأستبيان تشمل (الذكور- الإناث) , تشمل الاعمار (أقل من 30 سنة , 30-40 سنة , 40-50 سنة , 50 فأكثر) بمختلف المؤهلات (بكلاريوس , ماجستير , دكتوراة , أخري) بمهن تشمل (مدير , مدير إدارة , رئيس قسم , أخري (طبيب أسنان , مساعد طبيب) بسنوات خبرة (أقل من 5 سنوات , 5-10 سنة, 10-15 سنة , 15 سنة فأكثر)

ووجدت الدراسة أن تطبيق الأيزو ورضا العاملين في اختبار كاي وهناك فروق ذات دلالة إحصائية بنسبة مئوية , وأيضاً تم اختبار كاي للعلاقة بين تطبيق الأيزو (2008-9001) والتحسين المستمر للخدمات الصحية بقيمة (300.05) وهناك فروق ذات دلالة إحصائية (1%) , وقد تم أيضاً اختبار مربع كاي للعلاقة بين تطبيق ايزو(9001-2008) والحد من الاخطاء الطبية كانت (169.65) وهي اكبر وهناك فروق ذات دلالة إحصائية (1%) مما يشير إلى وجود قناعة لدى العاملين بضرورة تطبيق نظام إدارة الجودة بدرجة مئوية .

List of Content

NO	Subject	Page
	Preface	I
	Dedication	II
	Acknowledgement	III
	Abstract	IV
	المستخلص	V
	List of contents	VI
	List of Tables	VII
	List of figures	VIII
Chapter one		
1	Introduction	1
1-1	Research Problem	1
1-2	Research significance	2
1-3	Population of study	2
1-4	Research purpose	2
1-5	Research objective	2
Chapter two		
2	Quality	4
2-1	Definition of quality	4
2-1-1	Quality concept and perspectives	4
2-2	Quality management system (QMS)	4
2-3	ISO	5
2-3-1	The need for ISO	5
2-3-2	What is ISO 9000	6
2-3-3	Major Element in ISO9001-2000	6
2-3-4	Principles of quality management	7
2.3.5	ISO 9001-2008 requirement	8
2.4	Job satisfaction	21
2.4-1	Importance of Job Satisfaction	22
2.4-2	Job Satisfaction Factors	22
2.4-3	Employee Satisfaction definitions	24
2.4.4	How improve employee satisfaction	25
2.5	Previous studies	26
Chapter three		
3	Methodology	29
3.1	Study area	29

3.2	Study duration	29
3.3	Study Population	30
3.3.1	Inclusion criteria	30
3.5	Data collection tools and techniques	31
3.6	Data management	31
3.7	data analysis	31
3.8	Ethical consideration:	32
3.9	Limitation of the Study:	32
Chapter 4		
4.1	Data Analysis and Hypotheses Testing Population and Sample of the Study	34
4.1.2	The Study Tool	39
4.1.3	Reliability and Validity of the Questionnaire	40
4.1.4	Statistical Instruments	41
4.1.5	Application of the Study's Tool	42
4.2.	Test of the Study's Hypotheses	44
4.2.1	Results of the First Hypothesis	44
4.2.2	Results of the Second Hypothesis	50
4.2.3	Results of the Third Hypothesis	57
Chapter 5		
5.1	Discussion	63
5.1.1	Discussion of the first hypothesis	63
5.1.2	Discussion of the second hypothesis	63
5.1.3	Discussion of the third hypothesis	63
5.1.4	Discussion of previous studies	65
5.2	Conclusions	67
5.3	Recommendations	67
	References	68
	Annexes	

List of Tables

NO	Title	Page
(3-5-1)	Distribution for the study respondents according to the job	31
(4-1-1)	Distribution for the study respondents according to the Gender	34
(4-1-2)	Distribution for the study respondents according to the age	35
(4-1-3)	Distribution for the study respondents according to the qualification	36
(4-1-4)	Distribution for the study respondents according to the job	37
(4-1-5)	Distribution for the study respondents according to the experience	38
(4-1-6)	Statistical reliability and validity of the pre-test sample about the study questionnaire	41
(4-1-7)	Frequency distribution of the first hypothesis	42
(4-1-8)	Frequency distribution of the second hypothesis	43
(4-1-9)	Frequency distribution for the third hypothesis	43
(4-2-1)	Median of the questions of the first hypothesis	45
(4-2-2)	Chi-square test results for the questions of the first hypothesis	47
(4-2-3)	Frequency distribution for all questions of the first hypothesis	49
(4-2-4)	The median of the second hypothesis	51
(4-2-5)	Chi-square test results of the second hypothesis	53
(4-2-6)	The frequency distribution for all questions of the second hypothesis	55
(4-2-7)	The median of respondents' answers about the questions of the third hypothesis	57
(4-2-8)	Chi-square test results for respondents' answers about the questions of the third hypothesis	58
(4-2-9)	The frequency distribution for the respondents' answers about all questions of the third hypothesis	60
(4-2-10)	Summary of chi-square test for all hypotheses	62

List of figures

NO	Title	Page
(1-2)	Factors influence job satisfaction of employees at workplace	24
(4-1-1)	Frequency distribution according to the Gender	35
(2-14)	Frequency distribution according to the age	36
(3-1-4)	Frequency according to the qualification	37
(4-1-4)	Frequency according to the job	38
(4-1-5)	Respondents according to the experience	39
(4-2-1)	Respondents' answers about all questions of the first hypothesis	50
(4-2-2)	Respondents' answers about all questions of the second hypothesis	56
(4-2-3)	Respondents' answers about all questions of the third hypothesis	61
(4-2-4)	Summary of chi-square test for the respondents' answers about all hypotheses	62

Chapter one

Introduction

ISO stands for international organization for standards it was formed in 1947 with 25 members representing each form nation with headquarters at Geneva. ISO 9000 become accepted reference internationally for quality management in business, Organization invest great efforts in to achieving appropriate organization and through is better quality of product and service. Implementing ISO management decision that required consideration: organization environment, changes in the environment, risk associated with environment and process it employee.

The principle of quality management system is customer focus, leader ship, involvement of people, process approach, system approach to management, continual improvement, factual approach to decision making, mutually beneficial supplier relationships.

ISO (9001-2008) requirements, ISO (9001-2008) is generic in nature and concentrate on three areas:-

- Focus on customer
- Processes oriented (measure the effectiveness of process)
- Continual improvement

The standards contain eight clauses, first three clauses give the information about the organization, and while last five clauses are requirements the organization has to meet.

Ministry of health Khartoum state it's governmental organization care about health in state of Khartoum, they have many major problems in health care this causes of dis-satisfaction for employees and patients, since 2009 they apply ISO (9001-2008) in oral health directorate that change service in administration and improve in service.

We want to measure the employee satisfaction after apply quality management system (QMS).

Research Problem: -

The medical Errors in Sudan have negative influence among the Sudanese society (patients) they affect greatly their Trust Towards health provided by Ministry of Health.

Implementation of quality management system would solve the management problem.

Research significance: -

Implementing of ISO (9001-2008) solve management problem and care about continuous improvement service.

Implementing of ISO (9001-2008) is training employee to provide good service.

Quality management system ISO (9001-2008) focus on customer satisfaction.

Population of study:

Ministry of Health, Khartoum state (Dental Administration)

Dental Clinics in Khartoum State, Ministry of Health.

Research purpose:

Through ISO (9001-2008)

1-Improve health service

2- Satisfy (employee & customer).

3- Give good reputation to health service by decrease medical errors.

Research objective: -

Determine area of improvement of health section to solve problem

Increase employee satisfaction to satisfy their customer

Research hypothesis: -

-There is a statistically significant relation between applied ISO (9001-2008) and Employee satisfaction.

-There is a statistically significant relation between employee satisfaction and decrease medical errors.

-There is a statistically significant relation between applied ISO (9001-2008) and continuous Improvement.

Chapter two

Chapter Two

Literature review

2.1 The quality:

It is an undeniable fact that, in our contemporary world, being competitive is the key to success for any company. Competitiveness involves delighting the customer and exceeding his expectations and to achieve these goals, there is a need for quality. The benefit attached to the quality of products is the reputation it brings to company. In addition, the search for quality drives companies towards continual improvement of their management system and development of efficient ways to meet customer satisfaction (Khodabocus, 2011).

2.1.1 Definition of quality:

Quality is defined as the essential character of something, an inherent or distinguishing character, degree or grade of excellence (Lewis and Veerapillai, 2004). Quality satisfies the (expressed needs) customers, delights them by fulfilling their unstated or implied needs, and as per current trend, quality is to enchant the customers (Naagarazan and Arivalagar, 2006).

2.1.2 Quality concept and perspectives:

Quality has been a common concept in history, and has been one of the most controversial concepts. It is because of the variation of human perception in the world, as well as the difference in culture, that make the concept of quality and quality assurances vary from place to place. As there are different ways to understand and interpret the concept of quality, there is also neither way to define quality simply with a single perspective. Therefore, quality is not just characteristic of a product used daily, but also applied to a process or system. In modern business context, the concept of 8 quality expands to processes, organization, responsibilities, work instructions and resources to meet normal ISO standards (Hoyle, 2007). It is an essential approach and a tool for all business looking for sustainable development. This could be simply explained in a way that, when a business implements quality into all the process, improvement of business performance can always be created and renewed. After all, quality has become a necessary factor for a successful business (Bui, 2017).

2.2 Quality management system (QMS):

A quality management system (QMS) is formed by a series of coordinated activities that are carried out on a set of elements to achieve the quality of the products or

services offered to the customer or user. In the case of laboratory, the accuracy, reliability and timeliness of the analytical results reported defined its quality, and all aspects of analytical. The QMS plans, 9 controls, shares, and improves the elements that influence the fulfillment of user requirements and satisfaction as well. An alternative definition of a QMS is through the meaning of each word separately, according to the ISO 9000:2015 quality management system fundamentals and vocabulary: - System: a set of interrelated or interaction elements. - Management: coordinated activities to direct and control an organization. - Quality: degree in which a set of inherent characteristics of an object (product, service process, person, resource, etc.) meet the requirements (established need or expectation, generally implicit or mandatory). The business, planning, and control activities performed on a set of elements to achieve quality represent a QMS (Valdivies-Gomez and Aguilar-Quesada, 2018).

2.2.1 The purpose of a QMS in a Process-centered: A fundamental part of TQM is a focus on process thinking. A process is a series of steps that take inputs from suppliers (internal or external) and transforms them into outputs that are delivered to customers (internal or external). The steps required to carry out the process are defined, and performance measures are continuously monitored in order to detect unexpected variation.

2.3 ISO: -

ISO stands for international organization for standards and abbreviated as ISO. The word is derived from Greek, meaning equal. ISO was formed in the year 1947 with 25 members representing each from a Nation with headquarters at Geneva, Switzerland. Each nation is represented by its National Standards Institute.

2.3.1 The need for ISO: -

Basically standard not only meet Customer satisfaction but also raise the levels of quality, safety, reliability, efficiency and interchangeability at economical cost. After liberalization, globalization and privatization Policy, the international standardization has become essential to have fair and free trade across the globe. ISO is largest developer of standards. The technical committee of ISO, comprising of experts from industrial, technical and business sectors, is responsible for developing standards and put them into use. Others having relevant knowledge such as representatives from government agencies, testing laboratories, consumer

Association, environmentalists, academia, help the experts. The main objective of ISO is to develop standards, which have important economic and social implications, it not only helps the organization (manufacturer/service, health or legal and other professional services) in solving fundamental problems in production and distribution but to the society in total. They provide government with a technical base for health, safety and environment legislation. ISO is a voluntary organization occupying a pivotal position between public and private sectors in which unanimous opinion can be reached on solution so that both the requirements of business and needs of society are met. The ISO standards on quantities and units help us to conduct shipping and trade without chaos and confusion and help the world community to use scientific and technological development effectively. In addition, international standard helps us to preserve the environment and make the planet habitable. [5]

2.3.2 What is ISO 9000?

It is a guideline for selection and use of the standard on quality management system elements and quality assurance. Also it provides road map; how a company can select and use a particular standard and among four standards in series.

- ISO 9000- 2000 quality management system (QMS) - fundamental and vocabulary, discusses the fundamental concepts related to QMS and provides technology used in the other two standards.
- ISO 9001-2000 – QMS- requirements for certification by demonstrating conformance to QMS as specified by customer, regulatory bodies and the organization’s own requirements.
- ISO 9004:2000 –QMS – provides guidance on a wider range of objectives of a quality management system and aimed at overall performance improvement. Both ISO 9001 and 9004 standards are produced as a consistent pair and to be used in closer harmony.

2.3.3 Major Element in ISO9001-2000: -

1. responsibility: - requires top management commitment to create and maintain awareness of the importance of fulfilling customer requirements; establish the quality policy and the quality objectives and planning; establish a quality management system; perform management reviews and ensure availability of resource in time.

2. Resource management: - requires that the organization determines and provides the needed resource to establish and maintain the quality management system.

3. Product realization: - requires an organization to use outputs from quality planning and see the other process is consistent to realize that required product or service. Their sequence and interaction must then be determined, planned and implemented.

4. Measurement, analysis and improvement: - requires an organization to define, plan and implement measurement, monitoring and analysis processes to ensure that the quality management system, processes, and product or service conform to requirements and continually improve the effectiveness of quality management system.

2.3.4 Principles of quality management: -

1. Customer focus: organization should understand current and future customer need, should meet customer requirement and strive to exceed customer expectations.
2. Leadership: top management establishes unity of purpose and direction of the organization. They should create and maintain the internal environment.
3. Involvement of people: - their abilities are used for the full benefit of organization.
4. Process approach: -The desired result is achieved efficiently when activities and related processes are managed as a process.
5. System approach to management: -Identifying, understanding and managing inter-related processes as a system, helps in organization rather than pure feeling, past experience.
6. Continual improvement: - It is the permanent objective of organization.
7. Factual approach to decision making: - The effective decisions are based on the logical and intuitive analysis of data and information rather than pure feeling, past experience.
8. Mutually beneficial supplier relationships: - this enhances the ability and creates value to the customers simultaneously improving reputation for company and supplier.

2.3.5 ISO9001-2008 requirement: -

1- Scope

1.1 General

This International Standard specifies requirements for a quality management system where an organization a) needs to demonstrate its ability to consistently provide product that meets customer and applicable statutory and regulatory requirements) Aims to enhance customer satisfaction through the effective application of the system, including processes for continual improvement of the system and the assurance of conformity to customer and applicable statutory and regulatory requirements.

1.2 Application

All requirements of this International Standard are generic and are intended to be applicable to all organizations, regardless of type, size and product provided. Where any requirement(s) of this International Standard cannot be applied due to the nature of an organization and its product, this can be considered for exclusion. Where exclusions are made, claims of conformity to this International Standard are not acceptable unless these exclusions are limited to requirements within Clause 7, and such exclusions do not affect the organization stability, or responsibility, to provide product that meets customer and applicable statutory and regulatory requirements.

2- Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

2 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 9000 apply. Throughout the text of this International Standard, wherever the term “product” occurs, it can also mean “service”.

3 Quality management system

4.1 General requirements

the organization shall establish, document, implement and maintain a quality management system and continually improve its effectiveness in

accordance with the requirements of this International Standard. The organization shall

a) determine the processes needed for the quality management system and their application throughout the organization.

b) Determine the sequence and interaction of these processes.

c) Determine criteria and methods needed to ensure that both the operation and control of these processes are effective,

d) ensure the availability of resources and information necessary to support the operation and monitoring of these processes.

e) Monitor, measure where applicable, and analyze these processes.

f) Implement actions necessary to achieve planned results and continual improvement of these processes.

These processes shall be managed by the organization in accordance with the requirements of this International Standard.

Where an organization chooses to outsource any process that affects product conformity to requirements, the organization shall ensure control over such processes. The type and extent of control to be applied to the processes shall be defined within the quality management system.

4.2 Documentation requirements

4.2.1 General

The quality management system documentation shall include

a) documented statements of a quality policy and quality objectives,

b) a quality manual,

c) documented procedures and records required by this International Standard.

d) Documents, including records, determined by the organization to be necessary to ensure the effective planning, operation and control of its processes.

4.2.2 Quality manual

The organization shall establish and maintain a quality manual that includes

a) The scope of the quality management system, including details of and justification for any exclusions.

b) The documented procedures established for the quality management system, or reference to them.

c) Description of the interaction between the processes of the quality Management system.

4.2.3 Control of documents

Documents required by the quality management system shall be controlled. Records are a special type of document and shall be controlled according to the requirements given in 4.2.4.

A documented procedure shall be established to define the controls needed

- a) to approve documents for adequacy prior to issue,
- b) to review and update as necessary and re-approve documents,
- c) to ensure that changes and the current revision status of documents are identified,
- d) to ensure that relevant versions of applicable documents are available at points of use.
- e) To ensure that documents remain legible and readily identifiable,
- f) to ensure that documents of external origin determined by the organization to be necessary for the planning and operation of the quality management system are identified and their distribution controlled.
- g) To prevent the unintended use of obsolete documents, and to apply suitable identification to them if they are retained for any purpose.

4.2.4 Control of records

Records established to provide evidence of conformity to requirements and of the effective operation of the quality management system shall be controlled.

The organization shall establish a documented procedure to define the controls needed for the identification, storage, protection, retrieval, retention and disposition of records.

Records shall remain legible, readily identifiable and retrievable.

5- Management responsibility

5.1 - Management commitment

Top management shall provide evidence of its commitment to the development and implementation of the quality management system and continually improving its effectiveness by

- a) Communicating to the organization the importance of meeting customer as well as statutory and regulatory requirements.
- b) Establishing the quality policy.
- c) Ensuring that quality objectives are established.
- d) Conducting management reviews.
- e) Ensuring the availability of resources.

5.2 Customer focus

Top management shall ensure that customer requirements are determined and are met with the aim of enhancing customer satisfaction.

5.3 Quality policy

Top management shall ensure that the quality policy

- a) is appropriate to the purpose of the organization,
- b) includes a commitment to comply with requirements and continually improve the effectiveness of the quality management system.
- c) Provides a framework for establishing and reviewing quality objectives.
- d) Is communicated and understood within the organization.
- e) Is reviewed for continuing suitability.

5.4 Planning

5.4.1 Quality objectives

Top management shall ensure that quality objectives, including those needed to meet requirements for product, are established at relevant functions and levels within the organization. The quality objectives shall be measurable and consistent with the quality policy.

5.4.2 Quality management system planning

Top management shall ensure that

- a) the planning of the quality management system is carried out in order to meet the requirements given in 4.1, as well as the quality objectives.
- b) The integrity of the quality management system is maintained when changes to the quality management system are planned and implemented.

5.5 Responsibility, authority and communication

5.5.1 Responsibility and authority

Top management shall ensure that responsibilities and authorities are defined and communicated within the organization.

5.5.2 Management representative

Top management shall appoint a member of the organization's management who, irrespective of other responsibilities, shall have responsibility and authority that includes

- a) ensuring that processes needed for the quality management system are established, implemented and maintained.
- b) Reporting to top management on the performance of the quality management system and any need for improvement.

c) Ensuring the promotion of awareness of customer requirements throughout the organization.

5.5.3 Internal communication

Top management shall ensure that appropriate communication processes are established within the organization and that communication takes place regarding the effectiveness of the quality management system.

5.6 Management review

5.6.1 General

Top management shall review the organization's quality management system, at planned intervals, to ensure its continuing suitability, adequacy and effectiveness. This review shall include assessing opportunities for improvement and the need for changes to the quality management system, including the quality policy and quality objectives.

5.6.2 Review input

the input to management review shall include information on

- a) results of audits.
- b) Customer feedback.
- c) Process performance and product conformity.
- d) Status of preventive and corrective actions.
- e) Follow-up actions from previous management reviews,
- f) changes that could affect the quality management system.
- g) Recommendations for improvement.

5.6.3 Review output

the output from the management review shall include any decisions and actions related to

- a) improvement of the effectiveness of the quality management system and its processes.
- b) Improvement of product related to customer requirements.
- c) Resource needs.

6 Resource management

6.1 Provision of resources

the organization shall determine and provide the resources needed

- a) to implement and maintain the quality management system and continually improve its effectiveness.
- b) To enhance customer satisfaction by meeting customer requirements.

6.2 Human resources

6.2.1 General

Personnel performing work affecting conformity to product requirements shall be competent on the basis of appropriate education, training, skills and experience.

6.2.2 Competence, training and awareness

the organization shall

- a) determine the necessary competence for personnel performing work affecting conformity to product requirements.
- b) Where applicable, provide training or take other actions to achieve the necessary competence.
- c) Evaluate the effectiveness of the actions taken.
- d) Ensure that its personnel are aware of the relevance and importance of their activities and how they contribute to the achievement of the quality objectives.
- e) Maintain appropriate records of education, training, skills and experience.

6.3 Infrastructure

The organization shall determine, provide and maintain the infrastructure needed to achieve conformity to product requirements. Infrastructure includes, as applicable.

- a) Buildings, workspace and associated utilities.
- b) Process equipment (both hardware and software).
- c) Supporting services (such as transport, communication or information systems).

6.4 Work environment

the organization shall determine and manage the work environment needed to achieve conformity to product requirements.

7- Product realization

7.1 planning of product realization

The organization shall plan and develop the processes needed for product realization. Planning of product realization shall be consistent with the requirements of the other processes of the quality management system.

In planning product realization, the organization shall determine the following, as appropriate:

- a) quality objectives and requirements for the product.
- b) The need to establish processes and documents, and to provide resources

specific to the product.

c) Required verification, validation, monitoring, measurement, inspection and test activities specific to the product and the criteria for product acceptance.

d) Records needed to provide evidence that the realization processes and resulting product meet requirements.

7.2 Customer-related processes

7.2.1 Determination of requirements related to the product

The organization shall determine

a) requirements specified by the customer, including the requirements for delivery and post-delivery activities,

b) requirements not stated by the customer but necessary for specified or intended use, where known,

c) statutory and regulatory requirements applicable to the product.

d) Any additional requirements considered necessary by the organization.

7.2.2 Review of requirements related to the product

the organization shall review the requirements related to the product. This review shall be conducted prior to the organization's commitment to supply a product to the customer and shall ensure that

a) product requirements are defined,

b) contract or order requirements differing from those previously expressed are resolved.

c) The organization has the ability to meet the defined requirements.

7.2.3 Customer communication

the organization shall determine and implement effective arrangements for communicating with customers in relation to

a) product information.

b) Enquiries, contracts or order handling, including amendments.

c) Customer feedback, including customer complaints.

7.3 Design and development

7.3.1 Design and development planning

the organization shall plan and control the design and development of product. During the design and development planning, the organization shall determine

a) the design and development stages.

b) The review, verification and validation that is appropriate to each design and development stage.

c) The responsibilities and authorities for design and development.

The organization shall manage the interfaces between different groups involved in design and development to ensure effective communication and clear assignment of responsibility.

7.3.2 Design and development inputs

Input relating to product requirements shall be determined and records maintained. These inputs shall include

- a) functional and performance requirements,
- b) applicable statutory and regulatory requirements,
- c) where applicable, information derived from previous similar designs, and
- d) other requirements essential for design and development.

The inputs shall be reviewed for adequacy. Requirements shall be complete, unambiguous and not in conflict with each other.

7.3.3 Design and development outputs

the outputs of design and development shall be in a form suitable for verification against the design and development input and shall be approved prior to release. Design and development outputs shall

- a) meet the input requirements for design and development.
- b) Provide appropriate information for purchasing, production and service provision.
- c) Contain or reference product acceptance criteria, and
- d) specify the characteristics of the product this is essential for its safe and proper use.

7.3.4 Design and development review

at suitable stages, systematic reviews of design and development shall be performed in accordance with planned arrangements.

- a) To evaluate the ability of the results of design and development to meet requirements.
- b) To identify any problems and propose necessary actions. Participants in such reviews shall include representatives of functions concerned with the design and development stage(s) being reviewed. Records of the results of the reviews and any necessary actions shall be maintained.

7.3.5 Design and development verification

Verification shall be performed in accordance with planned arrangements and development outputs have met the design and development input requirements. Records of the results of the verification and any necessary actions shall be maintained.

7.3.6 Design and development validation

Design and development validation shall be performed in accordance with planned arrangements to ensure that the resulting product is capable of meeting the requirements for the specified application oriented use, where known. Wherever practicable, validation shall be completed prior to the delivery or implementation of the product. Records of the results of validation and any necessary actions shall be maintained.

7.3.7 Control of design and development changes

Design and development changes shall be identified and records maintained. The changes shall be reviewed, verified and validated, as appropriate, and approved before implementation. The review of design and development changes shall include evaluation of the effect of the changes on constituent parts and product already delivered. Records of the results of the review of changes and any necessary actions shall be maintained.

7.4 Purchasing

7.4.1 purchasing process

the organization shall ensure that purchased product conforms to specified purchase requirements. The type and extent of control applied to the supplier and the purchased product shall be dependent upon the effect of the purchased product on subsequent product realization or the final product. The organization shall evaluate and select suppliers based on their ability to supply product in accordance with the organization's requirements. Criteria for selection, evaluation and re-evaluation shall be established. Records of the results of evaluations and any necessary actions arising from the evaluation shall be maintained.

7.4.2 Purchasing information

purchasing information shall describe the product to be purchased, including, where appropriate.

- a) Requirements for approval of product, procedures, processes and equipment,
- b) requirements for qualification of personnel.

c) quality management system requirements.

The organization shall ensure the adequacy of specified purchase requirements prior to their communication to the supplier.

7.4.3 Verification of purchased product

The organization shall establish and implement the inspection or other activities necessary for ensuring that purchased product meets specified purchase requirements. Where the organization or its customer intends to perform verification at the supplier's premises, the organization shall state the intended verification arrangements and method of product release in the purchasing information.

7.5 Production and service provision

7.5.1 Control of production and service provision

the organization shall plan and carry out production and service provision under controlled conditions. Controlled conditions shall include, as applicable,

- a) the availability of information that describes the characteristics of the product.
- b) the availability of work instructions, as necessary.
- c) the use of suitable equipment,
- d) the availability and use of monitoring and measuring equipment,
- e) the implementation of monitoring and measurement.
- f) the implementation of product release, delivery and post-delivery activities.

7.5.2 Validation of processes for production and service provision

The organization shall validate any processes for production and service provision where the resulting output cannot be verified by subsequent monitoring or measurement and, as a consequence, deficiencies become apparent only after the product is in use or the service has been delivered. Validation shall demonstrate the ability of these processes to achieve planned results.

The organization shall establish arrangements for these processes including, as applicable.

- a) Defined criteria for review and approval of the processes,
- b) approval of equipment and qualification of personnel,
- c) Use of specific methods and procedures
- d) Requirements for records
- e) Revalidation.

7.5.3 Identification and traceability

Where appropriate, the organization shall identify the product by suitable means throughout product realization. The organization shall identify the product status with respect to monitoring and measurement requirements throughout product realization. Where traceability is a requirement, the organization shall control the unique identification of the product and maintain records

7.5.4 Customer property

the organization shall exercise care with customer property while it is under the organization's control or being used by the organization. The organization shall identify, verify, protect and safeguard customer property provided for use or incorporation into the product. If any customer property is lost, damaged or otherwise found to be unsuitable for use, the organization shall report this to the customer and maintain records

7.5.5 Preservation of product

The organization shall preserve the product during internal processing and delivery to the intended destination in order to maintain conformity to requirements. As applicable, preservation shall include identification, handling, packaging, storage and protection. Preservation shall also apply to the constituent parts of a product.

7.6 Control of monitoring and measuring equipment

The organization shall determine the monitoring and measurement to be undertaken and the monitoring and measuring equipment needed to provide evidence of conformity of product to determined requirements. The organization shall establish processes to ensure that monitoring and measurement can be carried out and are carried out in a manner that is consistent with the monitoring and measurement requirements.

Where necessary to ensure valid results, measuring equipment shall

- a) be calibrated or verified, or both, at specified intervals, or prior to use, against measurement standards traceable to international or national measurement standards; where no such standards exist, the basis used for calibration or verification shall be recorded

- b) be adjusted or re-adjusted as necessary;

- c) have identification in order to determine its calibration status;

d) be safeguarded from adjustments that would invalidate the measurement result.

e) be protected from damage and deterioration during handling, maintenance and storage

8- Measurement, analysis and improvement

8.1 General

The organization shall plan and implement the monitoring, measurement, analysis and improvement processes needed

a) to demonstrate conformity to product requirements.

b) To ensure conformity of the quality management system, and

c) to continually improve the effectiveness of the quality management system.

This shall include determination of applicable methods, including statistical techniques, and the extent of their use.

8.2 Monitoring and measurement

8.2.1 Customer satisfaction

As one of the measurements of the performance of the quality management system, the organization shall monitor information relating to customer perception as to whether the organization has met customer requirements. The methods for obtaining and using this information shall be determined.

8.2.2 Internal audit

the organization shall conduct internal audits at planned intervals to determine whether the quality management system

a) conforms to the planned arrangements the quality management system requirements established by the organization.

b) Is effectively implemented and maintained.

8.2.3 Monitoring and measurement of processes

the organization shall apply suitable methods for monitoring and, where applicable, measurement of the quality management system processes. These methods shall demonstrate the ability of the processes to achieve planned results. When planned results are not achieved, correction and corrective action shall be taken, appropriate.

8.2.4 Monitoring and measurement of product

The organization shall monitor and measure the characteristics of the product to verify that product requirements have been met. This shall be carried out at appropriate stages of the product realization process in accordance with the

planned arrangements .Evidence of conformity with the acceptance criteria shall be maintained. Records shall indicate the person(s) authorizing release of product for delivery to the customer. The release of product and delivery of service to the customer shall not proceed until the planned arrangements have been satisfactorily completed, unless otherwise approved by a relevant authority and, where applicable, by the customer.

8.3 Control of nonconforming product

The organization shall ensure that product which does not conform to product requirements is identified and controlled to prevent its unintended use or delivery. A documented procedure shall be established to define the controls and related responsibilities and authorities for dealing with nonconforming product. Where applicable, the organization shall deal with nonconforming product by one or more of the following ways:

- a) by taking action to eliminate the detected nonconformity;
- b) by authorizing its use, release or acceptance under concession by a relevant authority and, where applicable, by the customer.
- c) by taking action to preclude its original intended use or application;
- d) by taking action appropriate to the effects, or potential effects, of the nonconformity when non conforming product is detected after delivery or use has started. When nonconforming product is corrected it shall be subject to re-verification to demonstrate conformity to the requirements. Records of the nature of nonconformities and any subsequent actions taken, including concessions obtained, shall be maintained

8.4 Analysis of data

The organization shall determine, collect and analyze appropriate data to demonstrate the suitability and effectiveness of the quality management system and to evaluate where continual improvement of the effectiveness of the quality management system can be made. This shall include data generated as a result of monitoring and measurement and from other relevant sources. The analysis of data shall provide information relating to

- a) customer satisfaction.
- b) Conformity to product requirements.
- c) Characteristics and trends of processes and products, including opportunities for preventive action.
- d) Suppliers.

8.5 Improvement

8.5.1 Continual improvement

The organization shall continually improve the effectiveness of the quality management system through the use of the quality policy, quality objectives, audit results, analysis of data, corrective and preventive actions and management review.

8.5.2 Corrective action

The organization shall take action to eliminate the causes of nonconformities in order to prevent recurrence. Corrective actions shall be appropriate to the effects of the nonconformities encountered. A documented procedure shall be established to define requirements for a) reviewing nonconformities (including customer complaints),

- b) Determining the causes of nonconformities,
- c) Evaluating the need for action to ensure that nonconformities do not recur,
- d) Determining and implementing action needed,
- e) Records of the results of action taken.
- f) Reviewing the effectiveness of the corrective action taken.

8.5.3 Preventive action

the organization shall determine action to eliminate the causes of potential nonconformities in order to prevent their occurrence. Preventive actions shall be appropriate to the effects of the potential problems.

A documented procedure shall be established to define requirements for

- a) determining potential nonconformities and their causes.
- b) Evaluating the need for action to prevent occurrence of nonconformities.
- c) Determining and implementing action needed.
- d) Records of results of action taken.
- e) Reviewing the effectiveness of the preventive action taken.

2.4 Job satisfaction: -

Job satisfaction is defined as the extent to which an employee feels self-motivated, content & satisfied with his/her job. Satisfaction happens when an employee feels he or she is having job stability, career growth and a comfortable work life balance. This implies that the employee is having satisfaction at job as the work meets the expectations of the individual.

2.4.1 Importance of Job Satisfaction

A satisfied employee is always important for an organization as he/she aims to deliver the best of their capability. Every employee wants a strong career growth and work life balance at workplace. If an employee feels happy with their company & work, they look to give back to the company with all their efforts. Importance of job satisfaction can be seen from two perspectives i.e. from employee and employer perspective:

For Employees: Job satisfaction from an employee perspective is to earn a good gross salary, have job stability, have a steady career growth, get rewards & recognition and constantly have new opportunities.

For Employers: For an employer, job satisfaction for an employee is an important aspect to get the best out of them. A satisfied employee always contributes more to the company, helps control attrition & helps the company grow. Employers need to ensure a good job description to attract employees and constantly give opportunities to individuals to learn and grow. [6]

2.4.2 Job Satisfaction Factors

Job satisfaction is related to the psychology of an employee. A happy & content employee at a job is always motivated to contribute more. On the other hand, a dissatisfied employee is lethargic, makes mistakes & becomes a burden to the company.

The elements & factors which contribute to job satisfaction are:

1. Compensation & Working conditions: One of the biggest factors of job satisfaction is the compensation and benefits given to an employee. An employee with a good salary, incentives, bonuses, healthcare options is happier with their job as compared to someone who doesn't have the same. A healthy workplace environment also adds value to an employee.

2. Work life balance: Every individual wants to have a good work place which allows them time to spend with their family & friends. Job satisfaction for Employee is often due a good work life balance policy, which ensures that an employee spends quality time with their family along with doing their work. This improves the employee's quality of work life.

3. Respect & Recognition: Any individual appreciates and feels motivated if they are respected at their workplace. Also, if they are awarded for their hard work, it further motivates employees. Hence recognition is one of the job satisfaction factors.

4. Job security: If an employee is assured that the company would retain them even if the market is turbulent, it gives them immense confidence. Job security is one of the main reasons for job satisfaction for employees.

5. Challenges: Monotonous work activities can lead to dissatisfied employees. Hence, things like job rotation, job enrichment can help in job satisfaction of employees as well.

6. Career Growth: Employees always keep their career growth part as a high priority in their life. Hence, if a company helps groom employees and gives them newer job roles, it enhances the job satisfaction as they know they would get a boost in their career.

Job satisfaction is in regard to one's feelings or state-of-mind regarding the nature of their work. Job satisfaction can be influenced by a variety of factors, the quality of one's relationship with their supervisor, the quality of the physical environment in which they work, degree of fulfillment in their work.

There are several theories given which help in evaluating & measuring job satisfaction of employees at workplace. Some of them are:

- Hierarchy of Needs by Maslow
- Hygiene Theory by Herzberg

These help in understanding the parameters or factors which influence job satisfaction of employees at workplace



Figure 2-1
factors influence job satisfaction of employees at workplace

2.4.3 Employee Satisfaction definitions

Employee satisfaction, also known as job satisfaction, is the extent to which an individual is happy with their job and the role it plays in their life.

The extent to which employer’s priorities employee satisfaction depends on the employer and the industry – the Hawthorne studies and the work of George Elton Mayo in the 1930s put the link between employer satisfaction and productivity on the radar. Satisfaction researchers tend to differentiate between affective satisfaction and cognitive job satisfaction – affective satisfaction is the sum total of pleasurable emotions and feelings associated with the job and its place in the

individual's life, whereas cognitive satisfaction refers to rational satisfaction over particular facets of the job e.g. pay and day-to-day responsibilities. [7]

2.4.4 How improve employee satisfaction

- **Be realistic with your expectations**

Often the cause of stress and anxiety is unrealistic expectations placed on employees who don't feel they are able to voice their concerns when they feel overwhelmed. Work is increasingly taking away from personal life. It may be difficult to align the company's goals with keeping workers happy. But honest and frank discussions around expectations will go a long way in this regard.

- **Recognize good work**

Realizing and rewarding hard work is one of the easiest and cheapest ways to improve employee happiness. No one wants to feel like their efforts aren't being Recognized so praise your employees when they are working hard and going the extra mile.

- **Focus on the long-term**

Instead of looking at "quick wins" keep in mind the long-term strategic goals of the company and make sure all employees are on the same page. Working towards a common goal and mission can be an extremely good motivator.

- **Communicate more than you should**

There is no such thing as too much communication. In fact, a lack of communication is the most frequent cause of workplace frustration. Work on creating an open, honest communicative culture where your team is comfortable communicating their own thoughts and this starts with you sharing yours.

- **Care about employee well-being**

Show that you genuinely care about your employees' well-being. Take a two-pronged approach. Mental well-being is often overlooked but an essential part of job satisfaction. Creating a calm anxiety free work environment can help get the best out of your employees. And physical well-being like offering to subsidize gym memberships and promoting a fit healthy lifestyle by giving employees time for exercise is both inexpensive and a great way to create better work-life balance for your employees.

Offer opportunities for learning

Employee growth is one of the most important aspects of engagement. Once employees feel like they have stagnated they will eventually get bored and look

elsewhere for stimulation and new challenges. Keep star talent on board by Offering them opportunities to grow in the career and the company. This could include training, a challenging promotion or a learning budget that allows employees to pursue outside interests. [8]

2.5 Previous studies: -

Samah Hussein Abbass (June 2016) The main Purpose of this study was to investigate internal service quality in human resource management among bank employee in (Al Nile Bank) and the relationship between ISQ-HRM and employee satisfaction.

The study found that employee selection, employee training and development, work design, job definition employee rewards and compensation report high, positive and significant dimensionality to internal service quality in human resource management. The study further finds that internal service quality in human resource has positive and significant effect on employee job satisfaction. Based on finding of the study that the human resource development departments should review and enhance the motivation, training, and retention of good employees' selection and their rewards and recognitions, their training and development, work design and job definition all are the most important human resource management areas in enhancing the employees' job satisfaction and the retention of prospective employees

Another study done by Sara widdatAlla Ismail (October 2016) The Purpose of this study was investigate the impact of Implementation of ISO 9001:2008 quality management systems on employee's satisfaction in National Industries Company Omdurman/Sudan, where researcher used descriptive approach to its appropriateness for the purposes of study this study was conducted on a sample of (70) employees of National industries company employees. Questionnaire designed as a tool to collect data. (SPSS) software Program for statistical treatment appropriate to put the study for it according to the following changes: (gender, educational level, age, job). Result from the analysis of employee's feedback showed positive trends about 64.8% from the impact of National Industries company is committed to adopting and applying the principle of ISO 9001:2008, which is reflected in the employee's feedback result towards the company, which explained that the adoption of ISO 9001:2008 standard has appositive impact satisfaction in the national industries company.

NADIA S ABDALLAH (2017) The study represented a problem in the need to search for a new entrance commensurate with global economic changes, and through

which companies attempt to gain access to customer satisfaction and get a larger market share relying on achieving competitive advantage.

The total quality management is important and useful departments with in private and public companies, because they are working to enhance the performance

efficiency of the employees by developing the skill and train them as well as to motivate them by increasing salaries and intensives, the study purpose is to find out the role of total Quality management and its impact on the efficiency of performance of employee in Sudanese mobile telecom company (Zain), study followed the descriptive and analytical approach and the study population consisted of the company's employees, and the research sample take number of (83) employees from (Zain), the study used questionnaire data collection tool, and analyzed by statistical package program social Science (SPSS) . The main Hypothesis of the study is (no significant differences between the total quality management and the performance of employees).

The most important findings of the study: lack of Knowledge of the staff by the activities and direction of the quality management department because the lack of the lectures and workshops, and there is no transparency in budgeting of training and development for staff performance. The study recommended the need for attention to foster the culture and total quality among the employees and support management through attention to the total quality management and linked the performance measurement with salaries increase and incentives.

A study done by Shiraz Salah Mohamed El Hassan (2018) The study dealt with the role of implantation ISO 9001: 2015 certifications on customer satisfaction and employee performance.

The problem of the study is that many banking institution are not concerned with the implementation ISO 9001:2015, which makes them loss their competitive advantage.

The study tested the following hypotheses: there is a statistically significant relationship between the implementation ISO 9001: 2015 and customer satisfaction, quality of service, employee performance and employee loyalty. The study used the analytical descriptive method using the SPSS program to analyze the result of the field study, and found that the implementation ISO 9001: 2015 system in the worker National Bank has positive relationship with customer satisfaction with an average of (2.64) and a correlation coefficient (0.796) and positive relationship with quality of service with an average of (2.55) and correlation coefficients (0.818) and positive

relationship to the employees performance with an average of (2.49) and correlation coefficients (0.897) and a positive relationship to the employee's loyalty with an average of (2.27) and a correlation coefficient of (0.618) at 99% confidence level.

The study recommended a general recommendation to implementation of the ISO 9001: 2015 system on banks and institutions to increase efficiency and performance, increase competitive advantage, pay attention to employees' empowerment, raise awareness of the objectives of the organization, focus on good communication with the customer and special recommendation of the worker national bank of which can represent potential weaknesses such as meeting and job description. Communicate with customers and reduce service time.

study done by Basher Berama S Ahmed (2018) The aim of this study is to study the Role of Implementation ISO 9001 principles to the quality Service and satisfaction of beneficiaries in non-profit organizations the study also sought to identify the relationship between the quality management system and the level of service quality provided by the non-profit organizations and to identify after implementing the standard to the level of satisfaction of beneficiaries.

In order to achieve the objective of this study, a questionnaire was designed to study the variable of the study problem in order to test hypotheses so that the study community consist of the employees of the humanitarian aid & Development organization (HAD) and the beneficiaries of the service of the organization, the questionnaire designed for HAD employee include(20) items , and the questionnaire design for the beneficiaries employee include(10) items The statistical Package for social science (SPSS) program was used to analyze and examine the hypotheses. The study used many statistical methods for data analysis, the study concluded that.

There is a commitment from HAD to implement the principle of ISO 9001 and that organization provide a quality service, the study also found a correlation between the quality of service and the level of satisfaction of beneficiaries.

The study also found that there is a statistically significant difference in the geographic area where the service is provided.

2.7 Comparison between the present study and previous studies:

The present study agreed with the previous studies in that; they all dealt with the impact of implementation of ISO (9001) on Employee Satisfaction.

The previous studies dealt with the implementation of ISO (9001) in general but the present study deal of ISO (9001) Employee satisfaction in health sector.

Chapter Three

Methodology

3.1 Study area:

This study covers all the persons who work at Oral Health Directorate Ministry of Health Khartoum State.

3.2 Study duration:

This Study has been conducted From January2019 to Septemper2019

3.3 Study Population:

The original population for this study is all the persons who work at Oral Health Directorate Ministry of Health Khartoum State.

3.3.1 Inclusion criteria:

- The respondents from different Gender (Male, Female).
- The respondents from different ages (Less than 30 years, 30-40 years, 40-50 years, 50 years and over).
- The respondents from different qualifications (BSc. MSc., PhD., Other).
- The respondents from different occupations (Director Manager, Department Director, Head of Department, Other).
- The respondents from different experience years (less than 5 years, 5-10 years, 10-15 years, Over than 15 years).

3.5 Sample size:

The sample of the study was randomly selected from the study population, where the researcher distributed (100) questionnaires to the target of some entities, and (97) respondents who replied the questionnaires after filling them with all the required information which is approximately (97%) of the targeted.

Occupation	Respondents'	number	%
Director Manager	2	2.1	
Department Director	33	3.1	
Head of Department	24	7	
Dentist	68	70.1	
Total	97	100.0	

**The frequency distribution for the study respondents according to the job
Table No. (3-5-1)**

3.5 Data collection tools and techniques:

The procedures used for collecting the data and all the needed information in this study, are the observations, that are taken from the questionnaire. The process and the steps of collecting the data, which services the study, were conducted accurately under suitable conditions. All the data were analyzed later on depending on statistical and descriptive basis. The main used tool in this study was structured questionnaire, which was prepared by depending on the previous study and literature review, and was checked from some referees. The questionnaire was designed to collect the data that support the study and directly related to the necessity of budgeting as a tool of performance control in the laboratories. The questionnaire contain two main parts, first of them concerned with the basic information of the respondents that is: Gender, age, qualification, occupation, duration of service in the current job.

The second part of the questionnaire comprised (19) questions distributed to the three hypotheses as follows:

- First hypothesis, contains (7) questions.
- Second hypothesis, contains (7) questions.
- Third hypothesis, contains (5) questions.

3.6 Data management:

Data was gathered, decoded, and captured in Excel sheet. Then the data was analyzed by SPSS, and it presented and described by using the tabulation, diagrams, and figures.

3.7 data analysis:

In order to satisfy the study objectives and to test its hypotheses, we use the following statistical instruments:

1. Graphical figures.
2. Frequency distribution.
3. Person correlation coefficient.
4. Spearman-Brown equation for calculating Reliability coefficient.
5. Median.
6. Non-parametric Chi-square test.

In order to obtain accurate results, Statistical Package for Social Sciences (SPSS) was used. In addition, to design the graphical figures, which are needed for the study, the computer program (Excel) was also used.

3.8 Ethical consideration:

The Protocol has been submitted to the senate Research Ethics committee of Sudan University of Science and Technology. Then the Permission taken from Oral Health Directorate Ministry of Health Khartoum State.

3.9 Limitation of the Study:

- The researcher was delayed waiting several month because questionnaire change more than twice because of departure of dentist trained on the ISO system for Oral Health Directorate.
- One of the reason for the delay in the collection of the questionnaire is the political situation in Sudan and the accompanying civil disobedience to the Dentist.
- Lack of sources and books references in this field of Quality management

Chapter Four

Chapter Four

Analysis and Hypotheses Testing

In this section, data analysis for the study and test of its hypotheses will be done. To do that, firstly we consider the instruments of applied study, which contain the description of the study's population and its sample, method of collection data, reliability and validity of the study tool, and the statistical treatments that used the methodology of the study will be shown here.

4-1-1 Population and Sample of the Study

The original population for this study is all the persons who work at oral health directorate ministry of health Khartoum state.

The sample of the study was randomly selected from the study population, where the researcher distributed (100) questionnaires to the target of some entities, and (97) respondents who replied the questionnaires after filling them with all the required information which is approximately (97%) of the targeted.

The study sample respondents are differs according to the following characteristics:

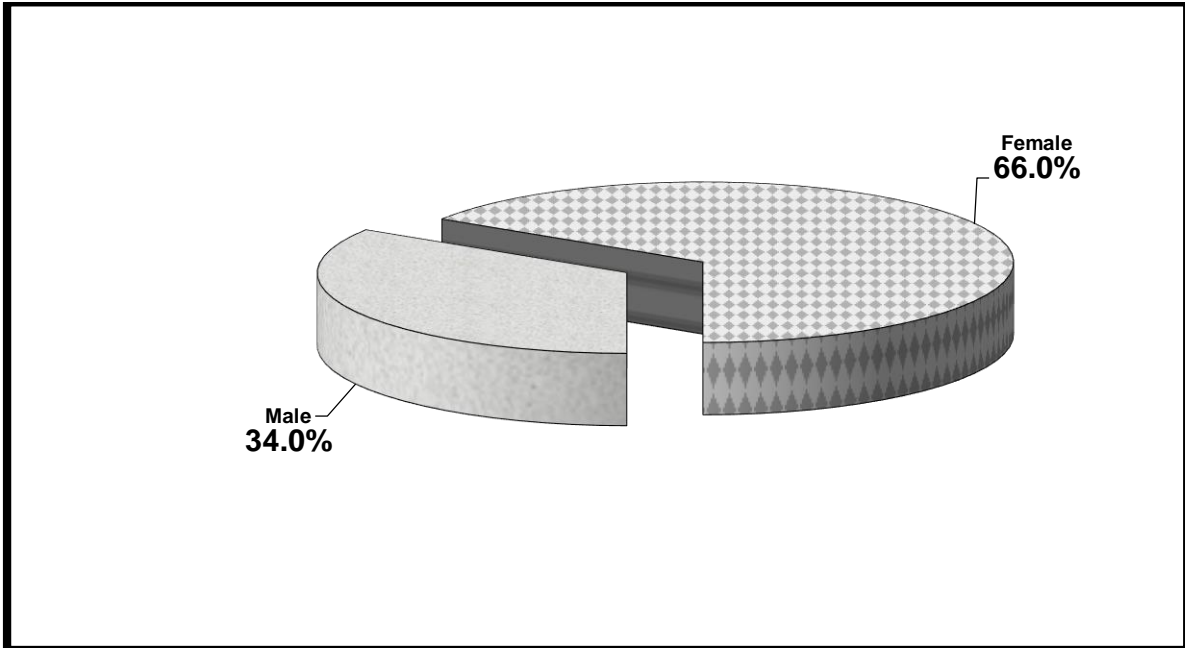
- The respondents from different Gender (Male, Female).
- The respondents from different ages (Less than 30 years, 30-40 years, 40-50 years, 50 years and over).
- The respondents from different qualifications (BSc. MSc., PhD., Other).
- The respondents from different occupations (Director Manager, Department Director, Head of Department, Other).
- The respondents from different experience years (less than 5 years, 5-10 years, 10-15 years, Over than 15 years).

1-The Gender:

The Gender	Respondents' number	%
Male	33	34.0
Female	64	66.0
Total	97	100.0

Source: The researcher from applied study, 2019

Table no. (4-1-1)
The frequency distribution for the study respondents according to the Gender



Source: The researcher from applied study, Excel Package, 2019

Figure no (4-1-1)

The frequency distribution for the study respondents according to the Gender

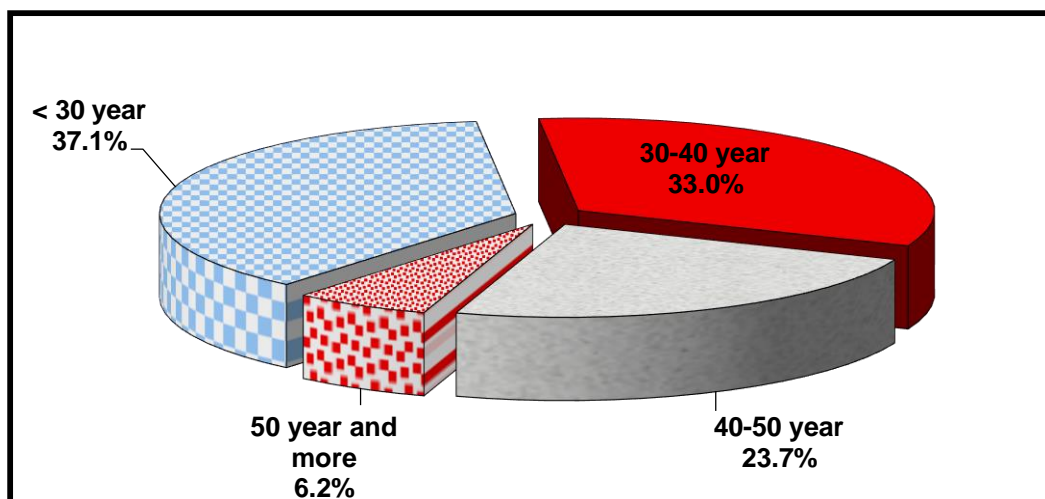
2- The Age:

Age class (year)	Respondents' number	%
Less than 30	36	37.1
30-40	32	33.0
40-50	23	23.7
50 and more	6	6.2
Total	97	100.0

Source: The researcher from applied study, 2019

Table no (4-1-2)

The frequency distribution for the study respondents according to the age



Source: The researcher from applied study, Excel Package, 2019

Figure (4-1-2)

The frequency distribution for the study respondents according to the age

We note from the table (4-1-2) and the figure (4-1-2), that most of the sample's respondents are of the age less than (30) year, their number was (36) persons with percentage (37.1). In addition, there are (32) person with percentage (33.0) aged between (30) and (40) year, and there are (23) person with percentage (23.7) aged between (40) and (50) year Lastly, there are (6) persons with percentage (6.2%) aged (50) year and more.

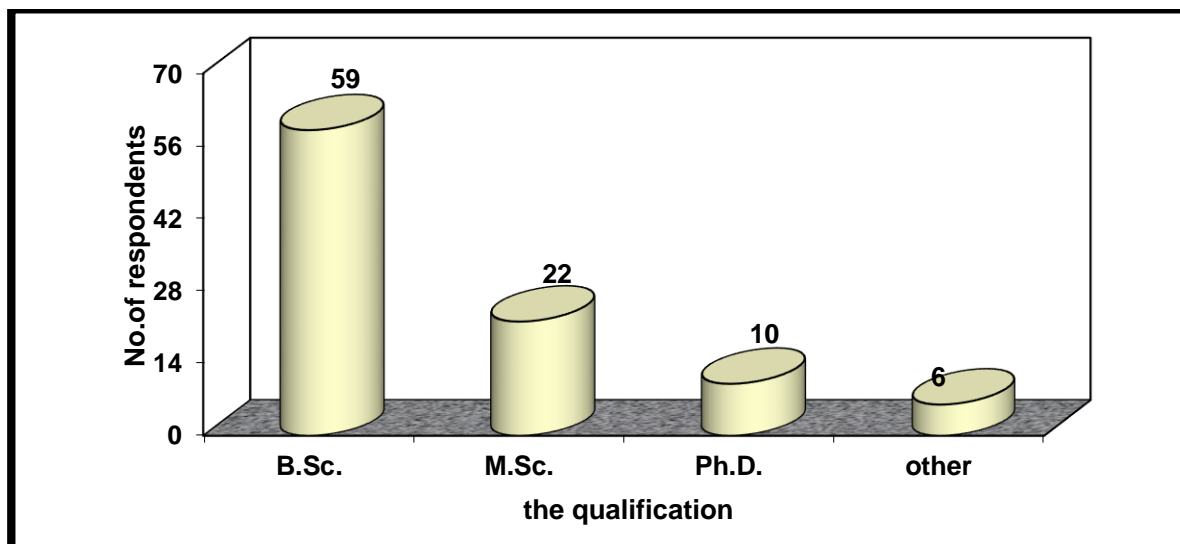
3- The Qualification:

Academic qualification	Respondents' number	%
BSc.	59	60.8
MSc.	22	22.7
PhD.	10	10.3
Other	6	6.2
Total	97	100.0

Source: The researcher from applied study, 2019

Table no (4-1-3)

The frequency distribution for the study respondents according to the qualification



Source: The researcher from applied study, Excel Package, 2019

Figure no (4-1-3)

The frequency distribution for the study respondents according to the qualification

From above table and figure, it is shown that most of the study's respondents have BSc. as academic qualification, the number of those was (59) persons with percentage (60.8%). The respondents have MSc. as academic qualification was (22) persons with (22.7%). The respondents have PhD as academic qualification was (10) persons with (10.3%). While the numbers of respondents have other academic qualifications was (6) persons with (6.2%).

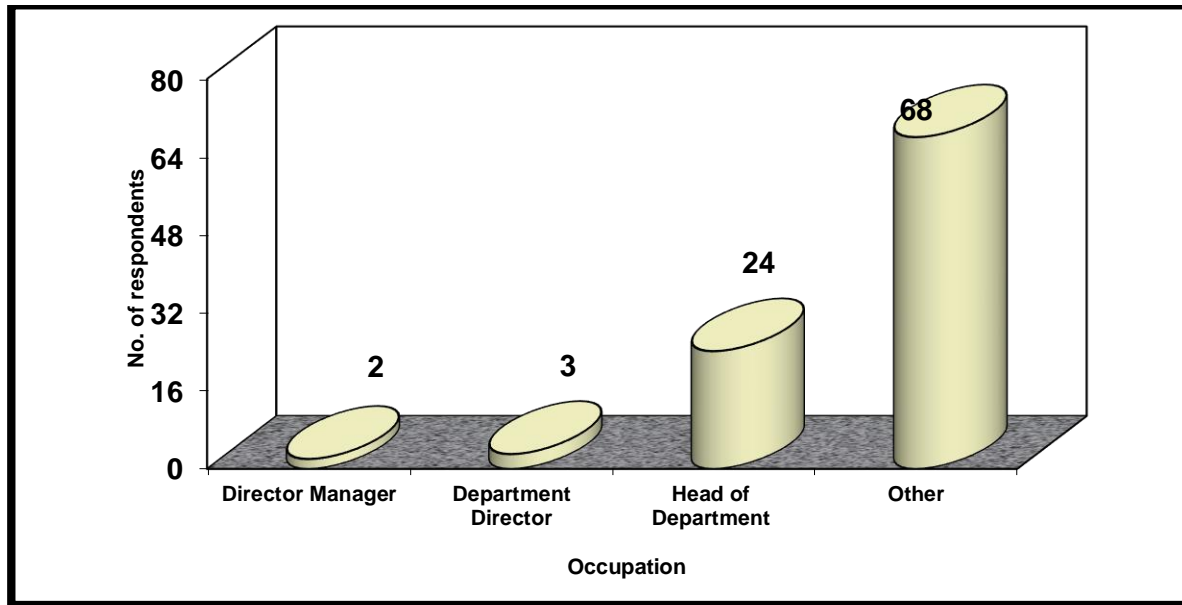
4- The Occupation:

Occupation	Respondents' number	%
Director Manager	2	2.1
Department Director	3	3.1
Head of Department	24	24.7
Other	68	70.1
Total	97	100.0

Source: The researcher from applied study, 2019

Table no (4-1-4)

The frequency distribution for the study respondents according to the job



Source: The researcher from applied study, Excel Package, 2019

Figure no (4-1-4)

The frequency distribution for the study respondents according to the job

The number of other (dentist and assistant) jobs in the study is (68) persons with percentage (70.1%), And the number of Heads of Departments is (24) persons with percentage (24.7%), and the number of Departments Directors is (3) persons with percentage (3.1%), In addition, the number of Directors managers is (2) persons with percentage (2.1%)

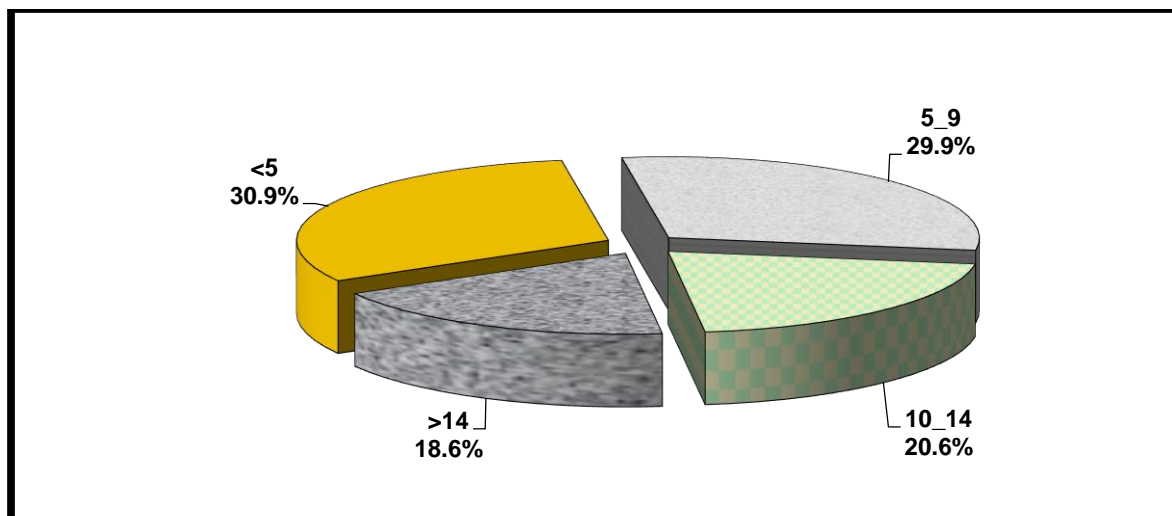
5- The Experience:

Experience years	Respondents' number	%
Less than 5	30	30.9
5-10	29	29.9
10-15	20	20.6
15 and more	18	18.6
Total	97	100.0

Source: The researcher from applied study, 2019

Table no (4-1-5)

The frequency distribution for the study respondents according to the experience



Source: The researcher from applied study, Excel Package, 2019

Figure no (4-1-5)

The frequency distribution for the study respondents according to the experience

We note from the table no (4-1-5) and the figure no.(4-1-5) that, most of the sample's respondents have experience less than (5) years, their number was (30) persons with percentage (30.9%). The number of sample's respondents whom have experience between (5) and (10) years was (29) persons with percentage (29.9%). While the number of sample's respondents whom have experience between (10) and (15) year was (20) persons with percentage (20.6%), Lastly, the number of sample's respondents whom have experience of (15) years and more, (18) persons with percentage (18.6%).

4-1-2 The Study Tool:

In general, the procedures used for collecting the data and all the needed information in this study, are the observations, that are get it from questionnaire. The process and the steps of collecting the data, which services the study, were conducted accurately under suitable conditions. All the data were analyzed later on depending on statistical and descriptive basis. The main used tool in this study was structured questionnaire, which was prepared by depending on the previous study and literature review, and was checked from some referees.

The questionnaire was designed to collect the data that support the study and directly related to the necessity of budgeting as a tool of performance control in the laboratories. The questionnaire contain two main parts, first of them concerned with the basic information of the respondents that is: Gender, age, qualification, occupation, duration of service in the current job.

The second part of the questionnaire comprised (19) questions distributed to the three hypotheses as follows:

- First hypothesis, contains (7) questions.
- Second hypothesis, contains (7) questions.
- Third hypothesis, contains (5) questions.

4-1-3 Reliability and Validity of the Questionnaire:

It is meant by the reliability of any test, to obtain the same results if the same measurement is used more than one time under the same conditions. In addition, the reliability means when a certain test was applied on a number of individuals and the marks of every one were counted; then the same test applied another time on the same group and the same marks were obtained; then we can describe this test as reliable. In addition, reliability is defined as the degree of the accuracy of the data that the test measures. Here are some of the most used methods for calculating the reliability:

1. Split-half by using Spearman-Brown equation.
2. Alpha-Cronbach coefficient.
3. Test and Re-test method
4. Equivalent images method.
5. Guttman equation.

On the other hand, validity also is a measure used to identify the validity degree among the respondents according to their answers on certain criterion. The validity is counted by a number of methods, among them is the validity using the square root of the (reliability coefficient). The value of the reliability and the validity lies in the range between (0-1). The validity of the questionnaire is that the tool should measure the exact aim, which it has been designed for.

The researcher calculated the validity statistically using the following equation:

$$\text{Validity} = \sqrt{\text{Reliability}}$$

The researcher calculated the reliability coefficient for the measurement, which was used in the questionnaire using (split-half) method. This method stands on the principle of dividing the answers of the sample individuals into two parts, i.e. items of the odd numbers e.g. (1, 3, 5, ...) and answers of the even numbers e.g. (2,4,6 ...). Then Pearson correlation coefficient between the two parts is calculated. Finally, the (reliability coefficient) was calculated according to Spearman-Brown Equation as the following:

$$\text{Reliability Coefficient } t = \frac{2 \times r}{1 + r}$$

r = Pearson correlation coefficient

For calculating the validity and the reliability of the questionnaire from the above equation, the researcher was distributed about (7) questionnaires to respondents. In addition, depending on the answers of the pre-test sample, the above Spearman-Brown equation was used to calculate the reliability coefficient using the split-half method; the results have been showed in the following table:

Hypotheses	Reliability	Validity
First	0.80	0.89
Second	0.87	0.93
Third	0.82	0.91
Overall	0.91	0.95

Source: The researcher from applied study, 2019

Table no. (4-1-6)

The statistical reliability and validity of the pre-test sample about the study questionnaire

We note from the results of above table that all reliability and validity coefficients for pre-test sample individuals about each questionnaire's hypothesis, and for overall questionnaire, are greater than (50%), and some of them are nearest to one. This indicates to the high validity and reliability of the answers, so, the study questionnaire is valid and reliable, and that will give correct and acceptable statistical analysis.

4-1-4 Statistical Instruments:

In order to satisfy the study objectives and to test its hypotheses, we use the following statistical instruments:

1. Graphical figures.
2. Frequency distribution.
3. Person correlation coefficient.
4. Spearman-Brown equation for calculating Reliability coefficient.
5. Median.
6. Non-parametric Chi-square test.

In order to obtain accurate results, Statistical Package for Social Sciences (SPSS) was used. In addition, to design the graphical figures, which are needed for the study, the computer program (Excel) was also used.

4-1-5 Application of the Study's Tool:

After the step of checking questionnaire reliability and validity, the researcher had distributed the questionnaire on determined study sample (97) persons.

No.	Statements	Strongly Agree	Agree	Natural	Disagree	Strongly disagree
1	The application of standard systems (ISO) complies with administration's commitment in terms of meeting the requirements of employees	30	32	12	15	8
2	An effective Organizational structure for dental administration	37	34	18	6	2
3	A quality department in the dental administration to apply quality control	47	35	10	3	2
4	The quality department is required to apply standard system, safety and infection control	48	32	11	3	3
5	The existence of standard procedures has an Impact on the promotion system in the ministry of health	29	23	14	8	23
6	The existence of clear system to motive the distinguished employee (Ideal employee)	33	17	16	11	20
7	Affair system for the distribution of opportunities among employees	30	25	16	8	18

Table no (4-1-7)

The frequency distribution for the respondents' answers about the questions of the first hypothesis

No.	Statements	Strongly Agree	Agree	Natural	Disagree	Strongly disagree
1	The application of standard procedures(ISO) fulfills the requirements of administration in Term of continuous Improving health services	41	33	14	5	4
2	The application of standard procedures led to the development of medical services in the administration	32	34	19	9	3

3	Continuous and special trainee for employee increase efficiency for them	51	23	9	11	3
4	The administration engages employees in streamlining work procedures	34	25	16	15	7
5	Administration promotes and maintains the quality policy	36	35	19	3	4
6	A clear methodology for reviewing , updating and re-accrediting documents	36	33	14	10	4
7	The existence of standard procedure(ISO) increased knowledge	33	36	13	12	3

Table no (4-1-8)

The frequency distribution for the respondents' answers about the questions of the second Hypothesis

No.	Statement	Strongly Agree	Agree	Natural	Disagree	Strongly disagree
1	There is a system to ensure that the dental equipment conforms to specification and standards	41	24	10	18	4
2	There have system to measure radiation quantity in dental radiology	31	14	13	25	14
3	Application of health safety and infection control standards in dental instruments and equipment	50	30	11	3	3
4	ISO system helps reduce medical errors	34	35	19	6	3
5	The specialized training to which employees undergo increases their efficiency	39	21	21	8	8

Table no (4-1-9)

The frequency distribution for the respondents' answers about the questions of the third hypothesis

4-2 Test of the Study's Hypotheses:

To answer on study's questions and to checking of its hypotheses, the median will be computed for each question from the questionnaire that shows the opinions of the study respondents about the Assessment of employee satisfaction in oral health directorate Using "ISO 9001-2008". To do that, we will gives five degrees for each answer "strongly agree", four degrees for each answer "agree", three degrees for each answer "fair", two degrees with each answer "disagree", and one degree for each answer with "strongly disagree". This means, in accordance with the statistical analysis requirements, transformation of nominal variables to quantitative variables. After that, we will use the non-parametric chi-square test to know if there are statistical differences amongst the respondents' answers about hypotheses questions.

4.2.1- Results of the First Hypothesis:

The first hypothesis in this study states the following:

“There is a statistically significant relationship between the apply of ISO 9001 and employee’s satisfaction”

The aim of this hypothesis is to show that the participations in the budget preparation will lead to the accuracy of estimated figure of the budget, and will enhance the coordination with in the firm for goal achievement.

To test this hypothesis, we must know the trend of respondents' opinions about each question from the hypothesis's questions, and for all questions. We compute the median, which is one of the central tendency measures, that uses to describe the phenomena, and it represents the centered answer for all respondents' answers after ascending or descending order for the answers.

No	Question	Median	Result
1	The application of standard systems (ISO) complies with administration's commitment in terms of meeting the requirements of employees	4	Agree
2	An effective Organizational structure for dental administration	4	Agree
3	A quality department in the dental administration to apply quality control	4	Agree
4	The quality department is required to apply standard system, safety and infection control	4	Agree
5	The existence of standard procedures has an Impact on the promotion system in the ministry of health	4	Agree
6	The existence of clear system to motive the distinguished employee (Ideal employee)	4	Agree
7	Affair system for the distribution of opportunities among employees	4	Agree
	Overall	4	Agree

Source: The researcher from applied study, SPSS Package, 2007

Table no (4-2-1)

The median of respondents' answers about the questions of the first hypothesis

From the table (4-2-1), it has shown that:

- The calculated value of the median for the respondents' answers of the 1st question is (4). This value means that, most of the respondents' are agreed with that "The application of standard systems (ISO) complies with administration's commitment in terms of meeting the requirements of employees".
- The calculated value of the median for the respondents' answers of the 2nd question is (4). This value means that, most of the respondents' are agreed with that "An effective Organizational structure for dental administration".
- The calculated value of the median for the respondents' answers of the 3rd question is (4). This value means that, most of the respondents' are agree with that "A quality department in the dental administration to apply quality control".
- The calculated value of the median for the respondents' answers of the 4th question is (4). This value means that, most of the respondents' are agreed with that "The quality department is required to apply standard system, safety and infection control".

- The calculated value of the median for the respondents' answers of the 5th question is (4). This value means that, most of the respondents' are agreed with that "The existence of standard procedures has an Impact on the promotion system in the ministry of health".
- The calculated value of the median for the respondents' answers of the 6th question is (4). This value means that, most of the respondents' are agreed with that "The existence of clear system to motive the distinguished employee (Ideal employee)".
- The calculated value of the median for the respondents' answers of the 7th question is (4). This value means that, most of the respondents' are agreed with that "Affair system for the distribution of opportunities among employees".
- The calculated value of the median for the respondents' answers about the all questions that related to the first hypothesis is (4). This value, in general, means that most of the respondents' have agreed with all what mentioned about the first hypothesis.

The above results do not mean that all the respondents in the sample have agreed with the questions because as mentioned in the table no. (4-2-7) there are some respondents who were disagreed with the questions. So, to test the statistical significance of the differences among the answers of the respondents for the first hypothesis, the chi-square test will used to indicate the differences for each question of the first hypothesis. Table no. (4-2-3) explains the results of the test for the questions as follows:

No	Questions	Degree of freedom	Chi-square value
1	The application of standard systems (ISO) complies with administration's commitment in terms of meeting the requirements of employees	4	24.49
2	An effective Organizational structure for dental administration	4	51.92
3	A quality department in the dental administration to apply quality control	4	85.84
4	The quality department is required to apply standard system, safety and infection control	4	81.71
5	The existence of standard procedures has an Impact on the promotion system in the ministry of health	4	14.29
6	The existence of clear system to motive the distinguished employee (Ideal employee)	4	14.08
7	Affair system for the distribution of opportunities among employees	4	14.80

Source: The researcher from applied study, SPSS Package, 2007

Table no (4-2-2)

Chi-square test results for respondents' answers about the questions of the first hypothesis

According to the table, we can demonstrate the results as follows:

- The calculated value of chi-square for the significance of the differences for the respondents' answers in the 1st question was (24.49) which is greater than the tabulated value of chi-square at the degree of freedom (4) and the significant value level (1%) which was (13.28). According to what mentioned in table no.(4-1-7), this indicates that, there are statistically significant differences at the level (1%) among the answers of the respondents, which support the respondents who have agreed with that "The application of standard systems (ISO) complies with administration's commitment in terms of meeting the requirements of employees".
- The calculated value of chi-square for the significance of the differences for the respondents' answers in the 2nd question was (51.92) which is greater than the tabulated value of chi-square at the degree of freedom (4) and the significant value level (1%) which was (13.28). According to what mentioned in table no.(4-1-7), this indicates that, there are statistically significant differences at the level (1%) among the answers of the respondents, which support the respondents who have

strongly agreed with that “An effective Organizational structure for dental administration”.

- The calculated value of chi-square for the significance of the differences for the respondents’ answers in the 3rd question was (85.84) which is greater than the tabulated value of chi-square at the degree of freedom ((4) and the significant value level (1%) which was (13.28). According to what mentioned in table no.(4-1-7), this indicates that, there are statistically significant differences at the level (1%) among the answers of the respondents, which support the respondents who have strongly agreed with that “A quality department in the dental administration to apply quality control”.
- The calculated value of chi-square for the significance of the differences for the respondents’ answers in the 4th question was (81.71) which is greater than the tabulated value of chi-square at the degree of freedom (4) and the significant value level (1%) which was (13.28). According to what mentioned in table no.(4-1-7), this indicates that, there are statistically significant differences at the level (1%) among the answers of the respondents, which support the respondents who have strongly agreed with that “The quality department is required to apply standard system, safety and infection control”.
- The calculated value of chi-square for the significance of the differences for the respondents’ answers in the 5th question was (14.29) which is greater than the tabulated value of chi-square at the degree of freedom (4) and the significant value level (1%) which was (13.28). According to what mentioned in table no.(4-1-7), this indicates that, there are statistically significant differences at the level (1%) among the answers of the respondents, which support the respondents who have strongly agreed with that “The existence of standard procedures has an Impact on the promotion system in the ministry of health”.
- The calculated value of chi-square for the significance of the differences for the respondents’ answers in the 6th question was (14.08) which is greater than the tabulated value of chi-square at the degree of freedom (4) and the significant value level (1%) which was (13.28). According to what mentioned in table no.(4-1-7), this indicates that, there are statistically significant differences at the level (1%) among the answers of the respondents, which support the respondents who have strongly agreed with that “The existence of clear system to motive the distinguished employee (Ideal employee)”.

- The calculated value of chi-square for the significance of the differences for the respondents' answers in the 7th question was (14.80) which is greater than the tabulated value of chi-square at the degree of freedom (4) and the significant value level (1%) which was (13.28). According to what mentioned in table no.(4-2-7), this indicates that, there are statistically significant differences at the level (1%) among the answers of the respondents, which support the respondents who have strongly agreed with that "Affair system for the distribution of opportunities among employees".

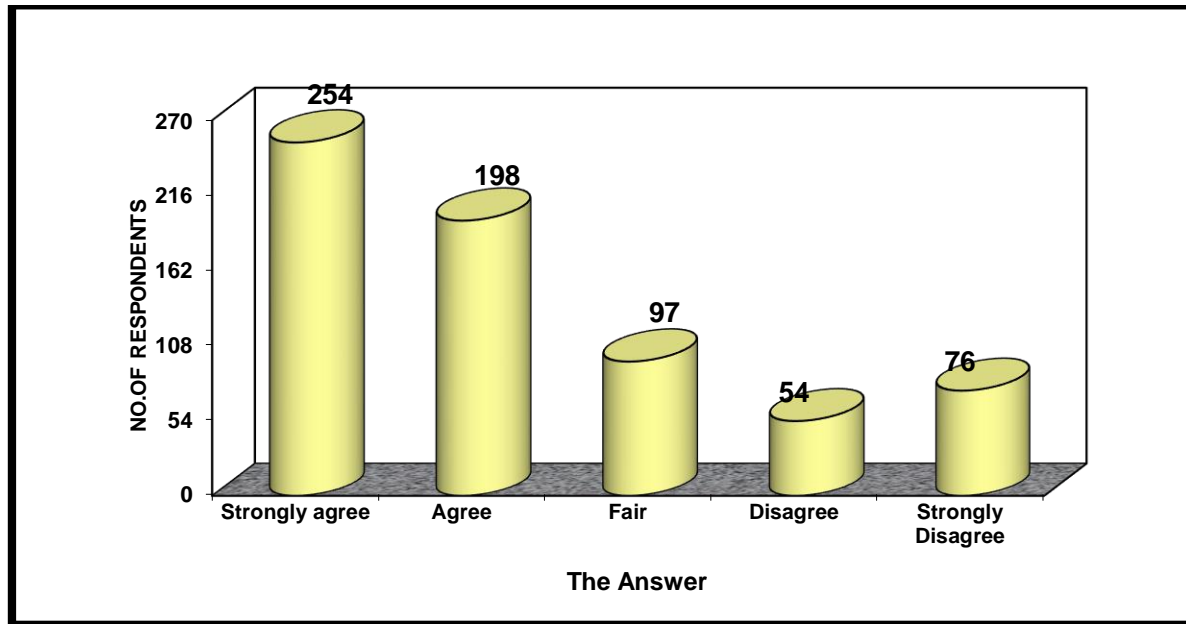
From above, we note that the first hypothesis was achieved for each question that related to this hypothesis, and to check the achievement of hypothesis for all questions, we see that the number of the questions is (7), and for each question there is (97) answers, so the total number of answers will be (679) answers. The following table summarizes these answers:

Answer	Number	%
Strongly Agree	254	37.4
Agree	198	29.2
Fair	97	14.3
Disagree	54	8.0
Strongly Disagree	76	11.2
Total	679	100.0

Source: The researcher from applied study, 2007

Table no (4-2-3)

The frequency distribution for the respondents' answers about all questions of the first hypothesis (There is a statistically significant relationship between the application of ISO 9001 and employee's satisfaction).



Source: The researcher from applied study, Excel Package, 2007

Figure no (4-2-1)

The frequency distribution for the respondents' answers about all questions of the first hypothesis

It is clear from table no.(4-2-3) and figure (4-2-1) that there are (254) answers with percentage (37.4%) were strongly agreed about all questions that related to the first hypothesis, (198) answers with percentage (29.2%) were agreed on that, (97) answers with percentage (14.3%) were fairly agreed about that, (76) answers with percentage (11.2%) were strongly disagreed, while (54) answers with percentage (8.0%) were disagreed about that. The value of chi-square test for the significant differences among these answers was (218.06) which is greater than the tabulated value of chi-square at the degree of freedom (4) and the significant value level (1%) which was (13.28). According to what mentioned in table no.(4-2-3), this indicates that, there are statistically significant differences at the level (1%) among the answers of the respondents, which support the respondents who have strongly agreed with the first hypothesis.

From above results, we see that the first hypothesis that states **“There is There is a statistically significant relationship between the application of ISO 9001 and employee’s satisfaction”** is fulfilled.

4.2.2- Results of the Second Hypothesis:

The second hypothesis in this study states the following:

“There is a statistically significant relationship between the application of ISO and continuous improvement in health services”

The aim of this hypothesis is to show that the company mainly depends upon the budgets system to control and evaluate the department performance.

To test this hypothesis, we must know the trend of respondents' opinions about each question from the hypothesis's questions, and for all questions. We compute the median as in the following table:

N	Question	Median	Result
1	The application of standard procedures(ISO) fulfills the requirements of administration in Term of continuous Improving health services	4	Agree
2	The application of standard procedures led to the development of medical services in the administration	4	Agree
3	Continuous and special trainee for employee increase efficiency for them	5	Strongly Agree
4	The administration engages employees in streamlining work procedures	4	Agree
5	Administration promotes and maintains the quality policy	4	Agree
6	A clear methodology for reviewing , updating and re-accrediting documents	4	Agree
7	The existence of standard procedure(ISO) increased knowledge	4	Agree
	Overall	4	Agree

Source: The researcher from applied study, SPSS Package, 2019

Table no.(4-2-4)

The median of respondents' answers about the questions of the second hypothesis

From the table (4-2-4), it has shown that:

- The calculated value of the median for the respondents' answers of the 1st question is (4). This value means that, most of the respondents' are agreed with that "The application of standard procedures(ISO) fulfills the requirements of administration in Term of continuous Improving health services".
- The calculated value of the median for the respondents' answers of the 2nd question is (4). This value means that, most of the respondents' are agreed with that "The application of standard procedures led to the development of medical services in the administration".

- The calculated value of the median for the respondents' answers of the 3rd question is (5). This value means that, most of the respondents' are strongly agree with that "Continuous and special trainee for employee increase efficiency for them".
- The calculated value of the median for the respondents' answers of the 4th question is (4). This value means that, most of the respondents' are agreed with that "The administration engages employees in streamlining work procedures".
- The calculated value of the median for the respondents' answers of the 5th question is (4). This value means that, most of the respondents' are agreed with that "Administration promotes and maintains the quality policy".
- The calculated value of the median for the respondents' answers of the 6th question is (4). This value means that, most of the respondents' are agreed with that "A clear methodology for reviewing , updating and re-accrediting documents".
- The calculated value of the median for the respondents' answers of the 7th question is (4). This value means that, most of the respondents' are agreed with that "The existence of standard procedure(ISO) increased knowledge".
- The calculated value of the median for the respondents' answers about the all questions that related to the second hypothesis is (4). This value, in general, means that most of the respondents' have agreed with all what mentioned about the second hypothesis.

The above results do not mean that all the respondents in the sample have agreed with the questions because as mentioned in the table no.(4-1-8) there are some respondents who were disagreed with the questions. So, to test the statistical significance of the differences among the answers of the respondents for the first hypothesis, the chi-square test will used to indicate the differences for each question of the second hypothesis. Table no.(4-2-5) explains the results of the test for the questions as follows:

No	Questions	Degree of freedom	Chi-square value
1	The application of standard procedures(ISO) fulfills the requirements of administration in Term of continuous Improving health services	4	58.00
2	The application of standard procedures led to the development of medical services in the administration	4	38.62
3	Continuous and special trainee for employee increase efficiency for them	4	75.22
4	The administration engages employees in streamlining work procedures	4	22.12
5	Administration promotes and maintains the quality policy	4	52.85
6	A clear methodology for reviewing , updating and re-accrediting documents	4	42.02
7	The existence of standard procedure(ISO) increased knowledge	4	42.54

Source: The researcher from applied study, SPSS Package, 2019

Table no (4-2-5)

Chi-square test results for respondents' answers about the questions of the second hypothesis

According to the table, we can demonstrate the results as follows:

- The calculated value of chi-square for the significance of the differences for the respondents' answers in the 1st question was (58.00) which is greater than the tabulated value of chi-square at the degree of freedom (4) and the significant value level (1%) which was (13.28). According to what mentioned in table no.(4-1-8), this indicates that, there are statistically significant differences at the level (1%) among the answers of the respondents, which support the respondents who have strongly agreed with that “The application of standard procedures (ISO) fulfills the requirements of administration in Term of continuous Improving health services”.
- The calculated value of chi-square for the significance of the differences for the respondents' answers in the 2nd question was (38.62) which is greater than the tabulated value of chi-square at the degree of freedom (4) and the significant value level (1%) which was (13.28). According to what mentioned in table no.(4-1-8), this indicates that, there are statistically significant differences at the level (1%) among the answers of the respondents, which support the respondents who have

agreed with that “The application of standard procedures led to the development of medical services in the administration ”.

- The calculated value of chi-square for the significance of the differences for the respondents’ answers in the 3rd question was (75.22) which is greater than the tabulated value of chi-square at the degree of freedom (4) and the significant value level (1%) which was (13.28). According to what mentioned in table no.(4-1-8), this indicates that, there are statistically significant differences at the level (1%) among the answers of the respondents, which support the respondents who have strongly agreed with that “Continuous and special trainee for employee increase efficiency for them”.

- The calculated value of chi-square for the significance of the differences for the respondents’ answers in the 4th question was (22.12) which is greater than the tabulated value of chi-square at the degree of freedom (4) and the significant value level (1%) which was (13.28). According to what mentioned in table no.(4-1-8), this indicates that, there are statistically significant differences at the level (1%) among the answers of the respondents, which support the respondents who have strongly agreed with that “The administration engages employees in streamlining work procedures”.

- The calculated value of chi-square for the significance of the differences for the respondents’ answers in the 5th question was (52.85) which is greater than the tabulated value of chi-square at the degree of freedom (4) and the significant value level (1%) which was (13.28). According to what mentioned in table no.(4-1-8), this indicates that, there are statistically significant differences at the level (1%) among the answers of the respondents, which support the respondents who have strongly agreed with that “Administration promotes and maintains the quality policy”.

- The calculated value of chi-square for the significance of the differences for the respondents’ answers in the 6th question was (42.02) which is greater than the tabulated value of chi-square at the degree of freedom (4) and the significant value level (1%) which was (13.28). According to what mentioned in table no.(4-1-8), this indicates that, there are statistically significant differences at the level (1%) among the answers of the respondents, which support the respondents who have strongly agreed with that “A clear methodology for reviewing , updating and re-accrediting documents”.

▪ The calculated value of chi-square for the significance of the differences for the respondents' answers in the 7th question was (42.54) which is greater than the tabulated value of chi-square at the degree of freedom (4) and the significant value level (1%) which was (13.28). According to what mentioned in table no.(4-1-8), this indicates that, there are statistically significant differences at the level (1%) among the answers of the respondents, which support the respondents who have agreed with that “The existence of standard procedure(ISO) increased knowledge”.

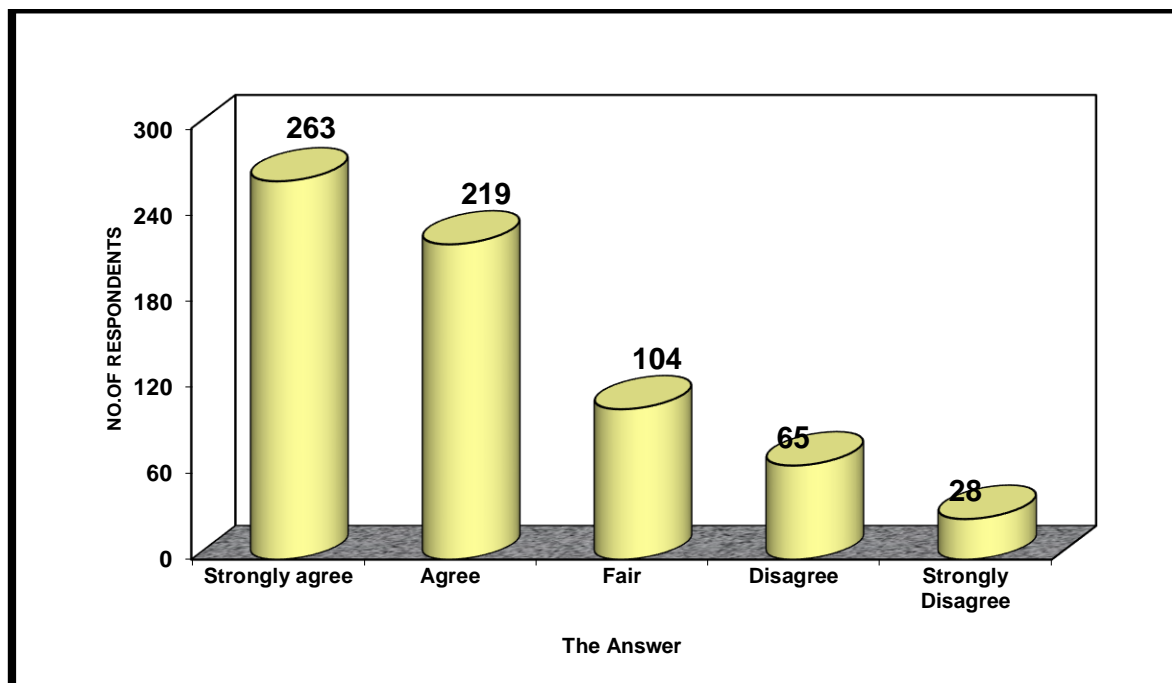
From above, we note that the second hypothesis was achieved for each question that related to this hypothesis, and to check the achievement of hypothesis for all questions, we see that the number of the questions is (7), and for each question there is (97) answers, so the total number of answers will be (979) answers. The following table summarizes these answers:

Answer	Number	%
Strongly Agree	263	38.7
Agree	219	32.3
Fair	104	15.3
Disagree	65	9.6
Strongly Disagree	28	4.1
Total	679	100.0

Source: The researcher from applied study, 2019

Table no (4-2-6)

The frequency distribution for the respondents' answers about all questions of the second hypothesis



Source: The researcher from applied study, Excel Package, 2019

Figure no (4-2-2)

The frequency distribution for the respondents' answers about all questions of the second hypothesis

It is clear from table no (4-2-6) and figure (4-2-2) that there are (263) answers with percentage (38.7%) were strongly agreed about all questions that related to the second hypothesis, (219) answers with percentage (32.2%) were agreed on that, (104) answers with percentage (15.3%) were fairly agreed about that, (65) answers with percentage (9.6%) were disagreed on that, while (28) answers with percentage (4.1%) were strongly disagreed about that. The value of chi-square test for the significant differences among these answers was (300.05) which is greater than the tabulated value of chi-square at the degree of freedom (4) and the significant value level (1%) which was (13.28). According to what mentioned in table no.(4-2-6), this indicates that, there are statistically significant differences at the level (1%) among the answers of the respondents, which support the respondents who have strongly agreed with the second hypothesis.

From above results, we see that the second hypothesis that states **“There is a statistically significant relationship between the application of ISO and continuous improvement in health services”** is fulfilled

4.2.3- Results of the Third Hypothesis:

The third hypothesis in this study states the following:

“There is a statistically significant relationship between the ISO application and reduce of medical errors”

The aim of this hypothesis is to show that there is no system use to estimate the budget figures except the management expectations.

To test this hypothesis, we must know the trend of respondents' opinions about each question from the hypothesis's questions, and for all questions. We compute the median as in the following table:

No	Question	Median	Result
1	There is a system to ensure that the dental equipment conforms to specification and standards	4	Agree
2	There have system to measure radiation quantity in dental radiology	3	Fair
3	Application of health safety and infection control standards in dental instruments and equipment	5	Strongly Agree
4	ISO system helps reduce medical errors	4	Agree
5	The specialized training to which employees undergo increases their efficiency	4	Agree
	Overall	4	Agree

Source: The researcher from applied study, SPSS Package, 2019

Table no (4-2-7)

The median of respondents' answers about the questions of the third hypothesis

From the table (4-2-7), it has shown that:

- The calculated value of the median for the respondents' answers of the 1st question is (4). This value means that, most of the respondents' are agreed with that “There is a system to ensure that the dental equipment conforms to specification and standards”.
- The calculated value of the median for the respondents' answers of the 2nd question is (3). This value means that, most of the respondents' are fairly agreed with that “There have system to measure radiation quantity in dental radiology”.

- The calculated value of the median for the respondents' answers of the 3rd question is (5). This value means that, most of the respondents' are strongly agreed with that "Application of health safety and infection control standards in dental instruments and equipment".
- The calculated value of the median for the respondents' answers of the 4th question is (4). This value means that, most of the respondents' are agreed with that "ISO system helps reduce medical errors".
- The calculated value of the median for the respondents' answers of the 5th question is (4). This value means that, most of the respondents' are agreed with that "The specialized training to which employees undergo increases their efficiency".
- The calculated value of the median for the respondents' answers about the all questions that related to the third hypothesis is (4). This value, in general, means that most of the respondents' have agreed with all what mentioned about the third hypothesis.

The above results do not mean that all the respondents in the sample have agreed with the questions because as mentioned in the table no (4-1-9) there are some respondents who were disagreed with the questions. So, to test the statistical significance of the differences among the answers of the respondents for the first hypothesis, the chi-square test will used to indicate the differences for each question of the third hypothesis. Table no (4-2-8) explains the results of the test for the questions as follows:

No	Questions	Degree of freedom	Chi-square value
1	There is a system to ensure that the dental equipment conforms to specification and standards	4	42.02
2	There have system to measure radiation quantity in dental radiology	4	13.67
3	Application of health safety and infection control standards in dental instruments and equipment	4	85.42
4	ISO system helps reduce medical errors	4	46.66
5	The specialized training to which employees undergo increases their efficiency	4	33.46

Source: The researcher from applied study, SPSS Package, 2019

Table no (4-2-8)

Chi-square test results for respondents' answers about the questions of the third hypothesis

According to the table, we can demonstrate the results as follows:

- The calculated value of chi-square for the significance of the differences for the respondents' answers in the 1st question was (42.02) which is greater than the tabulated value of chi-square at the degree of freedom (4) and the significant value level (1%) which was (13.28). According to what mentioned in table no (3-2-9), this indicates that, there are statistically significant differences at the level (1%) among the answers of the respondents, which support the respondents who have strongly agreed with that “There is a system to ensure that the dental equipment conforms to specification and standards”.
- The calculated value of chi-square for the significance of the differences for the respondents' answers in the 2nd question was (13.67) which is greater than the tabulated value of chi-square at the degree of freedom (4) and the significant value level (1%) which was (13.28). According to what mentioned in table no.(4-1-9), this indicates that, there are statistically significant differences at the level (1%) among the answers of the respondents, which support the respondents who have strongly agreed with that “There have system to measure radiation quantity in dental radiology ”.
- The calculated value of chi-square for the significance of the differences for the respondents' answers in the 3rd question was (85.42) which is greater than the tabulated value of chi-square at the degree of freedom (4) and the significant value level (1%) which was (13.28). According to what mentioned in table no.(4-1-9), this indicates that, there are statistically significant differences at the level (1%) among the answers of the respondents, which support the respondents who have strongly agreed with that “Application of health safety and infection control standards in dental instruments and equipment”.
- The calculated value of chi-square for the significance of the differences for the respondents' answers in the 4th question was (46.66) which is greater than the tabulated value of chi-square at the degree of freedom (4) and the significant value level (1%) which was (13.28). According to what mentioned in table no.(4-1-9), this indicates that, there are statistically significant differences at the level (1%) among the answers of the respondents, which support the respondents who have agreed with that “ISO system helps reduce medical errors”.

▪ The calculated value of chi-square for the significance of the differences for the respondents' answers in the 5th question was (33.46) which is greater than the tabulated value of chi-square at the degree of freedom (4) and the significant value level (1%) which was (13.28). According to what mentioned in table no.(4-1-9), this indicates that, there are statistically significant differences at the level (1%) among the answers of the respondents, which support the respondents who have strongly agreed with that “The specialized training to which employees undergo increases their efficiency”.

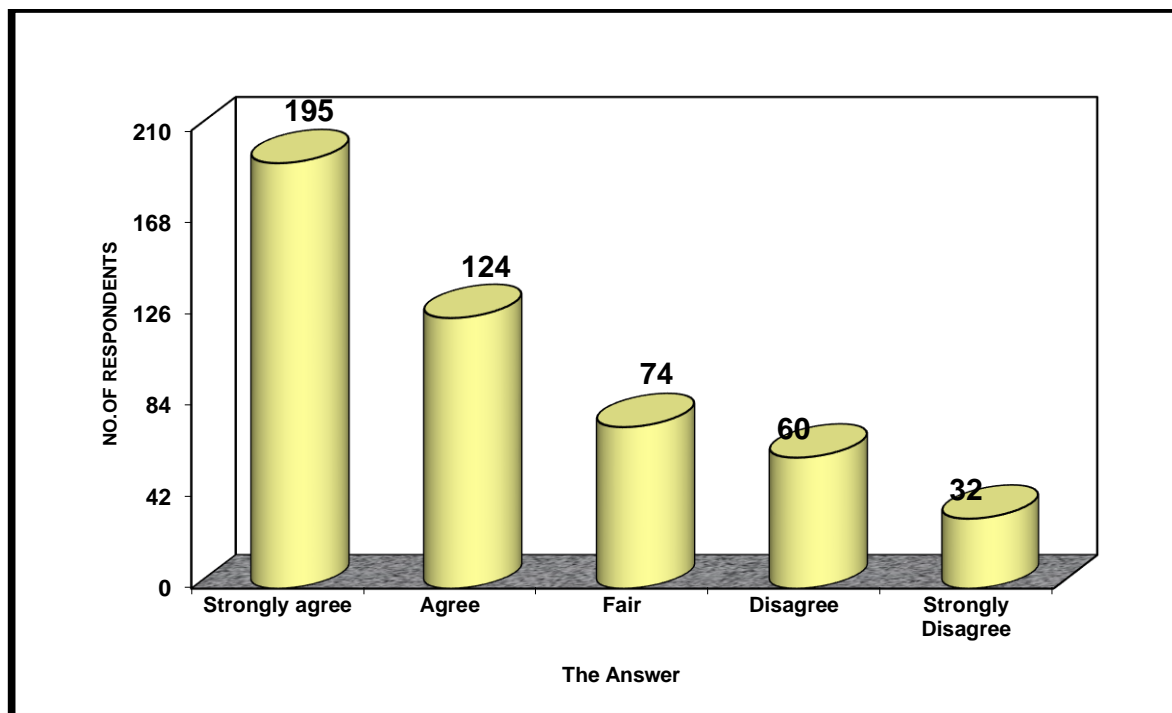
From above, we note that the third hypothesis was achieved for each question that related to this hypothesis, and to check the achievement of hypothesis for all questions, we see that the number of the questions is (5), and for each question there is (97) answers, so the total number of answers will be (485) answers. The following table summarizes these answers:

Answer	Number	%
Strongly Agree	195	40.2
Agree	124	25.6
Fair	74	15.3
Disagree	60	12.4
Strongly Disagree	32	6.6
Total	485	100.0

Source: The researcher from applied study, 2019

Table no (4-2-9)

The frequency distribution for the respondents' answers about all questions of the third hypothesis



Source: The researcher from applied study, Excel Package, 2019

Figure no (4-2-3)

The frequency distribution for the respondents' answers about all questions of the third hypothesis

It is clear from table no (4-2-9) and figure (4-2-3) that there are (195) answers with percentage (40.2%) were strongly agreed about all questions that related to the third hypothesis, (124) answers with percentage (25.6%) were agreed on that, (74) answers with percentage (15.3%) were fairly agreed about that, (60) answers with percentage (12.4%) were disagreed about that, while (32) answers with percentage (6.6%) were strongly disagreed about that. The value of chi-square test for the significant differences among these answers was (169.65) which is greater than the tabulated value of chi-square at the degree of freedom (4) and the significant value level (1%) which was (13.28). According to what mentioned in table no. (4-2-9), this indicates that, there are statistically significant differences at the level (1%) among the answers of the respondents, which support the respondents who have a strongly agreed with the third hypothesis.

From above results, we see that the third hypothesis that states **““There is a statistically significant relationship between the ISO application and reduce of medical errors”** is fulfilled.

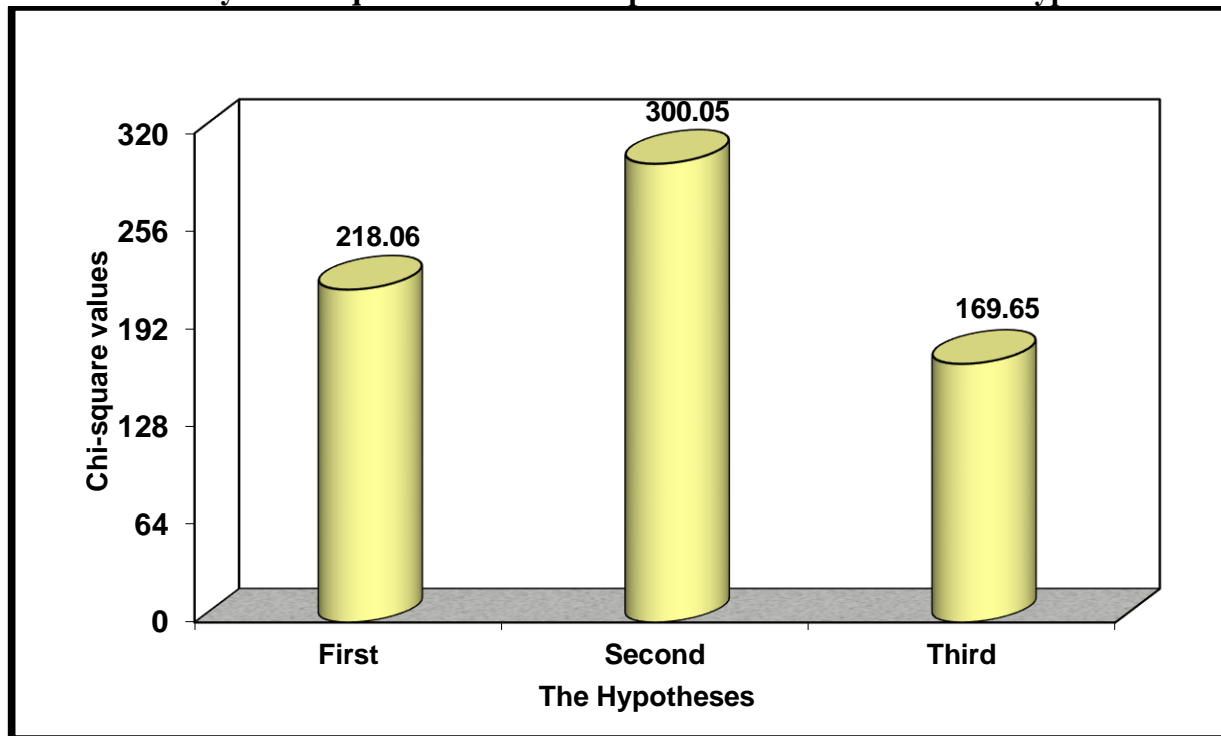
We can summarize the results of the study hypotheses in the following table and figure:

No	Hypotheses	Chi-square value
1	There is a statistically significant relationship between the application of ISO 9001 and employee's satisfaction	218.06
2	There is a statistically significant relationship between the application of ISO and continuous improvement in health services	300.05
3	There is a statistically significant relationship between the ISO application and reduce of medical errors	169.65

Source: The researcher from applied study, 2019

Table no (4-2-10)

Summary of chi-square test for the respondents' answers about all hypotheses



Source: The researcher from applied study, Excel Package, 2019

Figure no (4-2-4)

Summary of chi-square test for the respondents' answers about all hypotheses

From above table and figure, and according to the values of chi-square test, that the first hypothesis is fulfilled in first order because it has the second largest value of chi-square (300.05). The first hypothesis is fulfilled with second order according to the second largest value of chi-square (218.06), Lastly, the third hypothesis is fulfilled with third order according to third largest value of chi-square (169.65).

Chapter Five

Chapter five

Discussion, conclusion and Recommendation

5.1- Discussion

5.1.1 Discussion of the first hypothesis:

There is a statistically significant relationship between the application of ISO 9001 and employee's satisfaction

There are statistically significant differences at the level (1%) among the answers of the respondents, which support the respondents who have strongly agreed with the first hypothesis. That means relationship between the application of ISO 9001-2008 and employee's satisfaction is fulfilled.

5.1.2 Discussion of the second hypothesis:

“There is a statistically significant relationship between the application of ISO and continuous improvement in health services”

value of chi-square test for the significant differences among these answers was (300.05) which is greater than the tabulated value of chi-square at the degree of freedom (4) and the significant value level (1%) which was (13.28). this indicates that, there are statistically significant differences at the level (1%) among the answers of the respondents, which support the respondents who have strongly agreed with the second hypothesis.

5.1.3 Discussion of the third hypothesis:

“There is a statistically significant relationship between the ISO application and reduce of medical errors”

The value of chi-square test for the significant differences among these answers was (169.65) which is greater than the tabulated value of chi-square at the degree of freedom (4) and the significant value level (1%) which was (13.28). According to what mentioned in table no (4-2-9), this indicates that, there are statistically significant differences at the level (1%) among the answers of the

respondents, which support the respondents who have a strongly agreed with the third hypothesis.

5.1.4 Discussion of Previous study

First Study: impact of Perceived Internal Service quality on employee satisfaction

The study finds that employee selection, employee training and development, work design, employee rewards and compensation report high, positive and significant dimensionality to internal service quality in human resource management, this consistent with this Study on of application ISO 9001-2008 and continuous improvement health services.

The study finds that internal service quality in human resource has positive and significant effect on employee job satisfaction.

This study found application ISO and employee satisfaction on chi-square test was (218.06) chi-square, there are statistically significant differences at the level (1%) support the respondents who have strongly agreed.

The first study is consistent with this study in internal service quality effect in job satisfaction, in this Study have strongly agreed when Application ISO on employee satisfaction.

Second study: Impact of Implementation ISO 9001:2008 quality management system on Employee Satisfaction

Result from the analysis of employee's feedback showed positive trends about 64.8% from the impact of National Industries company is committed to adopting and applying the principle of ISO 9001:2008, the adoption of ISO 9001:2008 standard has appositve impact satisfaction in the national industries company

This study found application ISO and employee satisfaction on chi-square test was (218.06) chi-square, there are statistically significant differences at the level (1%) support the respondents who have strongly agreed.

The study of impact of Implementation ISO 9001-2008 is consistent with this study on positive impact in employee satisfaction.

Third study: Impact of the total management on the employee's performance in Sudanese mobile telecom company – Zain

The study recommended the need for attention to foster the culture and total quality among the employees and support management through attention to the total quality management and linked the performance measurement with salaries increase and incentives.

And This study in application ISO and employee satisfaction on health sector.

Fourth study: Role of Implementation ISO9001:2015 on customer's and employee's performance

It found that the implementation ISO 9001: 2015 system in the worker National Bank has positive relationship with customer satisfaction with an average of (2.64) and a correlation coefficient (0.796) and positive relationship with quality of service with an average of (2.55) and correlation coefficients (0.818) and positive relationship to the employees performance with an average of (2.49) and correlation coefficients (0.897) and a positive relationship to the employee's loyalty with an average of (2.27) and a correlation coefficient of (0.618) at 99% confidence level.

This study found application ISO 9001:2008 on employee satisfaction on chi-square test was (218.06) chi-square, there are statistically significant differences at the level (1%) support the respondents who have strongly agreed. And also further chi-square test for the relation of application ISO 9001-2008 and continuous improvement was (300.05) of chi-square at the degree of freedom (4). there are statistically significant differences at the level (1%) among respondents.

The relation between two studies first on application of ISO 9001-2015 employee performance (ISO Application have positive relation with employee satisfaction and employee satisfaction) and this study of assessment of employee satisfaction using ISO 9001-2008.

Fifth study: Role of implementation the principle of ISO 9001: 2008 on the quality of service and satisfaction of beneficiaries in non-profit organization

The study found a correlation between the quality of service and the level of satisfaction of beneficiaries.

Application ISO 9001-2008 and continuous improvement health services was (300.05) of chi-square at the degree of freedom (4). There are statistically significant differences at the level (1%) among respondents.

The relation between two studies they found a correlation between implementation ISO 9001-2008 and quality service.

5.2 conclusions:

1-There is statically significant correlation application (ISO 9001-2008) and employee satisfaction at oral health directorate ministry of health Khartoum state.

2-There is statically significant correlation application of ISO in administration and meeting the requirements of employees.

3- There is statically significant correlation application of ISO and continuous improvement in health services.

4- There is statically significant correlation application of ISO system helps reduce medical errors.

5.3 Recommendations:

- Continuous specialized training for employees.
- Developing a method of motivation and reward for employees.
- Training the Oral Health Directorate employees about ISO 9001-2008 in order to improve their concept and compliance towards ISO 9001-2015 and orienting them about improvement project of ISO system and Quality Improvement system.

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Annexes

Sudan University of science and technology
College of graduate study

**A study to Obtain a master's degree in quality management and excellence
entitled :-**

***Assessment of employee satisfaction in oral health directorate Using
“ISO 9001-2008”***

Case study: - oral health directorate ministry of health Khartoum state

Aim of study

Identify gaps and challenges facing health workers, especially dental service, in order to improve the quality of medical services.

Please fill the form to use the data to access the result of the study and confirm the confidentiality of data.

1- Gender

A- Male B- Female

2- Age

A- Less than 30 B- 30 Less than 40 C- 40 less than 50

D- more than 50

3- Qualifications

A- Baccalaureate B- Master C- Doctorate

D- Extra

4- Job Experience

A- less than 5 years B- 5 less than 10 years

C- 10 less than 15 years D- More than 15 years

5- Management :

A- Director manager B- Department Director C- Head of Department

D- Extra

The focus the first study:

If find any relation between apply of ISO 9001 and employee's satisfaction

NO	Expression	Strongly agree	Agree	Natural	disagree	Strongly disagree
1	The application of standard systems complies with administration's commitment in terms of meeting the requirements of employees					
2	An effective Organizational structure for dental management					
3	A quality department in the dental administration to quality control					
4	The quality department is required to apply standard system, safety and infection control					
5	The existence of standard procedures has an Impact on the promotion system in the ministry of health					
6	The existence of clear system to motive the distinguished employee (Ideal employee)					
7	Affair system for the distribution of opportunities among workers					

The focus the second study:

The relationship between the application of ISO and continuous improvement in health

No	Expression	Strongly agree	Agree	Natural	disagree	Strongly disagree
1	The application of standard procedures(ISO) fulfills the requirements of administration in Term of continuous Improving health services					
2	The application of standard procedures led to the development of medical services in the administration					
3	Continuous and special trainee for employee increase efficiency for them					
4	The administration work with employees' involvement in streamlining procedures of work					
5	Administration follows standards and clear rules of accountability					
6	The administration works to promote the policy of excellence					

The focus the third study:

There are a Statically significant relationship between ISO application and decreasing of medical erroes.

No	Expression	Strongly agree	Agree	Natural	disagree	Strongly disagree
1	ISO system clear Implementing					
2	The administration motivated their employees for development their self technically and academically					
3	The administration encourages work in the homogeneous team work					
4	The moral stimulation of the administration such as thanksgiving, decoration and vows worsen the focus of work and reduces medical errors.					
5	The specialized training that staff undergoes improves their efficiency.					

دراسة لنيل درجة الماجستير في إدارة الجودة والإمتياز بعنوان :-

قياس رضا العاملين بإدارة الأسنان باستخدام النظم القياسية- نظام الأيزو (9001-2008)

دراسة حالة إدارة الأسنان بوزارة الصحة ولاية الخرطوم

الهدف من الدراسة :-

التعرف على الفجوات والتحديات التي تواجه العاملين في القطاع الصحي وخاصة خدمات طب الأسنان بهدف تحسين جودة الخدمة الطبية .

الرجاء التكرم ملء الإستمارة للإستفادة من البيانات للوصول لنتائج الدراسة ونؤكد على سرية البيانات

معلومات أساسية:

1- النوع

أ- ذكر ب- أنثى

2- العمر

أ- أقل من 30 عام ب- 30 عام الى 40 عام

ج- من 40 عام الى 50 50 عام فأكثر

3- المؤهلات:

أ- بكالوريوس ب- ماجستير ج- دكتورة د- أخرى

4- الإدارة

أ- مدير عام ب- مدير إدارة ج- رئيس قسم

د- أخرى

5- الخبرة العملية في الوظيفة الحالية

أ- أقل من 5 سنوات ب- من 5 الى 10 سنوات

ج- من 10 الى 15 سنة د- 15 سنة فأكثر

المحور الأول :-

توجد علاقة بين تطبيق النظم القياسية الأيزو "9001" ورضا العاملين

الرقم	العبارة	أوافق بشدة	أوافق	محايد	لا أوافق	لا أوافق بشدة
1	تطبيق النظم القياسية يتوافق مع التزام الوزارة من حيث الوفاء بمتطلبات العاملين					
2	وجود هيكل تنظيمي فاعل لإدارة الأسنان					
3	وجود قسم للجودة بإدارة الأسنان لمراقبة الجودة					
4	قسم الجودة يلزم بتطبيق النظم القياسية والسلامة ومكافحة العدوى					
5	وجود الاجراءات القياسية له أثر علي نظام الترقيات بالوزارة					
6	وجود نظام واضح لتحفيز العاملين المميزين (الموظف المثالي)					
7	وجود نظام عادل لتوزيع الفرص بين العاملين					

المحور الثاني :-
العلاقة بين تطبيق الأيزو والتحسين المستمر في الخدمات الطبية

الرقم	العبارة	أوافق بشدة	أوافق	محايد	لا أوافق	لا أوافق بشدة
1	تطبيق الإجراءات القياسية يحقق إحتياجات الوزارة المختلفة من حيث تحسين الخدمات الطبية					
2	تطبيق نظام الإجراءات القياسية أدى إلى تطور الخدمات الطبية بالإدارة					
3	التدريب المستمر المتخصص للعاملين يزيد من كفاءة العاملين					
4	تقوم الإدارة بإشراك العاملين في تبسيط الإجراءات الخاصة بالعمل					
5	تعمل الإدارة علي تعزيز سياسة الجودة والمحافظة عليها					
6	وجود منهجية واضحة لمراجعة وتحديث الوثائق واعادة اعتمادها					
7	وجود الإجراءات القياسية عمل علي زيادة المعرفة					

المحور الثالث :-
العلاقة بين تطبيق الأيزو وتقليل الأخطاء الطبية

الرقم	العبارة	أوافق بشدة	أوافق	محايد	لا أوافق	لا أوافق بشدة
1	يوجد نظام للتأكد من مطابقة أجهزة الأسنان للمواصفات والمقاييس					
2	يوجد نظام لمراقبة كمية الإشعاع بجهاز أشعة الأسنان					
3	تطبيق معايير السلامة الصحية ومكافحة العدوى في الأدوات ومعدات الأسنان					
4	نظام أيزو ساعد علي التقليل من الأخطاء الطبية					
5	التدريب المتخصص التي يخضع لها العاملين تزيد من كفاءتهم					