

Beyond using Total Quality Management in the health care organizations

ما وراء استخدام إدارة الجودة الشاملة في مؤسسات الرعاية الصحية

Mr. Boualem MESSAOUDI¹

PhD student

Higher School of Commerce, Algiers. Algeria

messaoudmessaoud928@gmail.com

Dr. Abdelkader BELLAKHDAR

Lecturer teacher « A »

University of Laghouat. Algeria

bellakhdar.aek@gmail.com

Received: 20/12/2017

Accepted: 14/01/2019

Abstract:

The aim of the study is to try to address the issue of TQM in terms of being one of the most modern trends in business management, through a comprehensive presentation of its concept, foundations, and its most important principles, with also its importance in the economic organizations and the active role which can plays in the hospitals sector, on the patient and the quality of the provided health care service, as well as the focus on continuous improvement, with favorable price and timely delivery, the results showed that TQM can contribute effectively not only to improving the quality of health services but also to building a modern health sector

Key words: Total Quality; Total Quality Management; Hospitals Sector

JEL Classification Codes: I110, M110

ملخص:

الغرض من الدراسة هو معالجة مسألة إدارة الجودة الشاملة باعتبارها واحدة من أكثر الاتجاهات الحديثة في إدارة الأعمال، مع عرض شامل لأهم مفاهيمها وأسسها ومبادئها، وأهميتها في المؤسسات الاقتصادية وعلى المريض ونوعية الخدمة الصحية المقدمة، فضلا عن التركيز على التحسين المستمر مع أولوية ضمان سعر مناسب وسرعة في التسليم، أظهرت النتائج بأن إدارة الجودة الشاملة يمكنها المساهمة بشكل فاعل ليس فقط في تحسين جودة الخدمات الصحية ولكن في بناء قطاع صحي حديث.

كلمات مفتاحية: الجودة الشاملة؛ إدارة الجودة الشاملة؛ قطاع المستشفيات.

تصنيف JEL: M110, I110

¹ **The sender:** Boualem MESSAOUDI, Email: messaoudmessaoud928@gmail.com

Introduction:

Improving the quality of care is an important objective, even if it helps to perpetually questioning knowledge, brings together hospital actors, at the same time, professionals are above all experts whose principle of excellence they refer quality is that of mastering the technical tasks of care, the teams of management are attached to the respect of rules of internal of the hospital; quality, which in their view is essentially matter of compliance with standards of security or internal regulations.

Quality at the hospital has been and remains largely structured by a confrontation of knowledge from the medical, nursing and administrative world, this knowledge, constituting the hospital professional bureaucracy, characterize co-production quality in the hospital as a process that simultaneously involves the development and submission to rules, standards and administrative type knowledge, in this process, the confrontation between respect for the knowledge of healthcare professionals and compliance with knowledge from standard operating procedures advocated by management team's hospitality occupies a central place, this confrontation, which constitutes a phenomenon known and described in other sectors, reports on balances to manage between different organizational knowledge, the hospital actors are thus led through accreditation, to manage these confrontations of knowledge, it should be identifying the key players, who are confronted with daily confrontation and evolution of this knowledge.

To shed light on the issues of accreditation, we will present in a first part, the milestones in the history of quality development at the hospital, and then we will present the methodological approach chosen to conduct an analysis of the "Steering" of this knowledge in the day-to-day of hospital management.

And from the above the central question can be raised: ***What is TQM and what role can it plays at the level of hospital organizations and different medical centers?***

To answer the previous problem, the following sub-questions can be asked:

- 1- What is quality?
- 2- What is Total Quality Management?
- 3- What is the role of TQM in health organizations?

Hypothesis:

- The quality is the degree or standard of excellence of product or service.
- TQM is a management approach for an organization, centered on quality, based on the participation of all its members and aiming at long-term success through customer satisfaction.
- TQM aims to achieve the best possible health products and services.

The importance of studying:

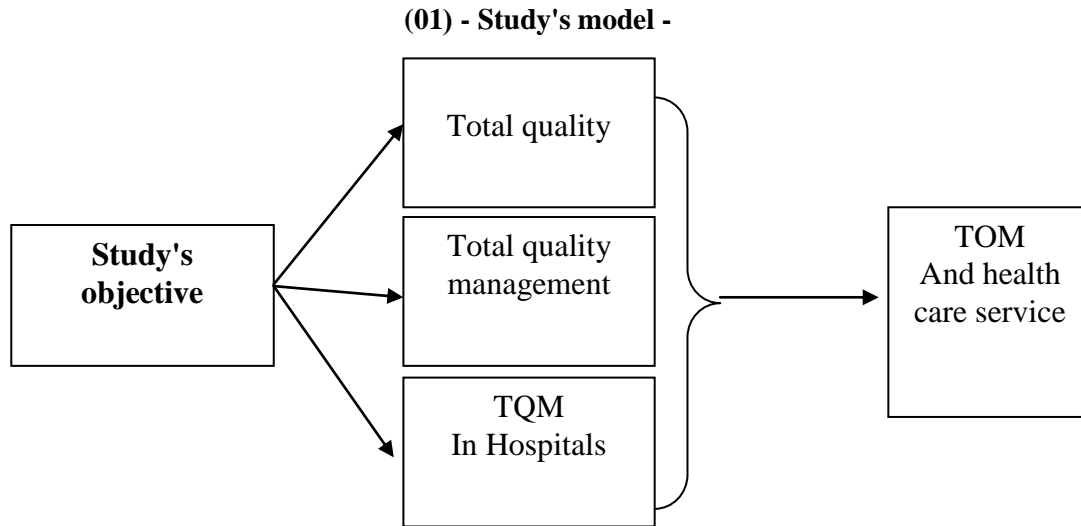
The importance of the study turns out in trying to determine the importance of quality management as a modern administrative thinking in health institutions, by focusing on quality and ways to improve and develop.

Objectives of the study:

- The objectives of the study are as follows:

- 1- Defining the concept of quality;
- 2- To address the concept of Total Quality Management
- 3- Highlighting the role of Total Quality Management in health enterprises.

Study's model:



Source: by researchers

Previous studies:

EMAMIAN. S, *TQM and Customer Satisfaction towards Business Excellence*, International Journal of Learning Management Systems, Department of Mechanical and Manufacturing Engineering, Faculty of Engineering, University Putra Malaysia, 2016.

This study concluded that in the 1980s, Total Quality Management (TQM) became popular as the key to survive in this competitive world; it was introduced and known as a main factor to become a pioneer and a leading edge in any business. The whole idea of total quality management is about change, it implies that since change is one of the unavoidable issues of our lives, why not lead this change. We can be the leaders of this change and let it happen whenever and wherever we need it, and not at the wrong place and at the wrong time. Since the customer satisfaction plays almost the most essential role in the market and business excellence, one of the major objectives of TQM is customer satisfaction, this study tries to introduce the most attended issues about TQM and customer satisfaction and the relation between them in the literature, this paper then seeks to identify the effects and methods of gaining the customer satisfaction towards business excellence through the application of TQM.

- CHANDRUPATLA. R, *Quality Concepts*, Cambridge University Press, UK, 2010.

This study focused on identifying the concepts of quality, historical relevance, and theoretical contributions, and concluded that successful organizations are those whose main objective is to achieve quality and customer satisfaction.

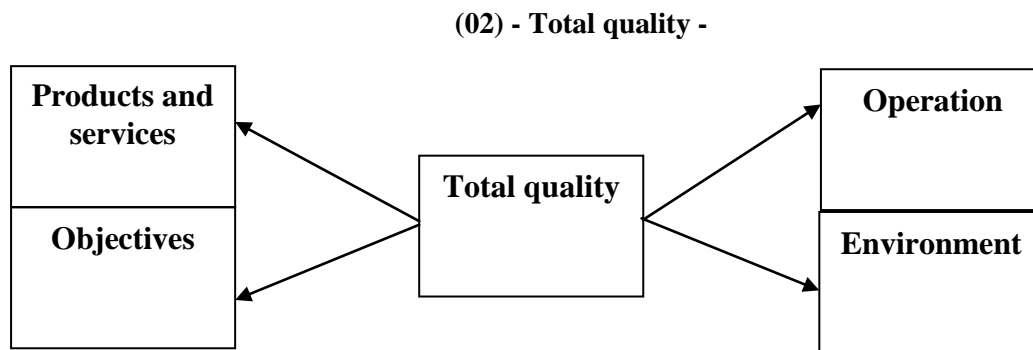
1- Total quality:

Total quality is an organization management style, focused on quality, based on the participation of all its members and aiming at long-term success through satisfaction of the client and benefits for the members of the organization and for the society.

Total Quality, for a company, is a policy that tends to, Permanent mobilization of all its members to improve:

- The quality of its products and services;
- The quality of its operation;
- The quality of its objectives,
- The relation to the evolution of its environment.¹

And the following figure explains more:



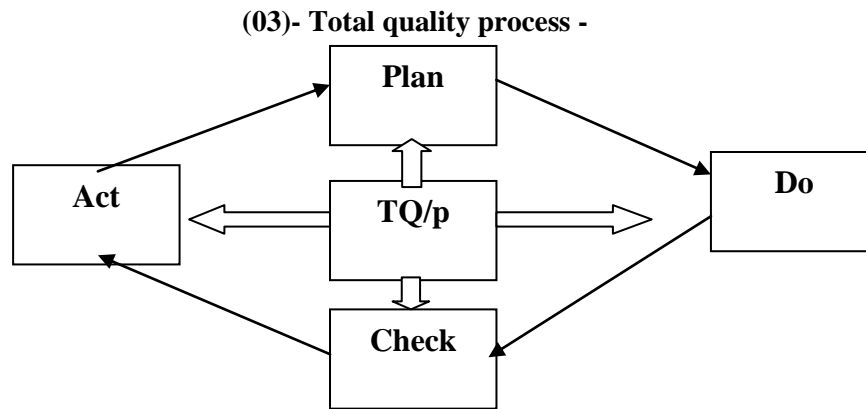
Source: GOPAL. R, Ibid, p 02

It seems to us that everything is said: it is clear that we are in a logical continuous improvement and that it concerns all services or process even though they are not directly involved in the product, this goes well beyond ISO 9001: 2008, it's clear that ISO 9001, in its certification context, cannot encompass the entire area covered by the total quality. So it's not a criticism of him.

There is no more opposition to the ISO 9001 standard to which we will make frequent references throughout this book, the guide represented by ISO 9004 is a step towards total quality as we understand it; Of course, we refer to the PDCA which is a guide for any quality:

- Plan: Prepare, plan;
- Do: Develop, realize, implement;
- Check: Check, check;
- Act (or Adjust): Act, adjust, react.²

And the following figure explains more:



Source: DEMING. E, Out of the crisis, MIT institute, Boston, 1982, p 22

Without questioning the merits it seems to us a problem related to the terminology English, the term Plan, literally translated into French, does not enough emphasis on goal setting during this phase.

With regard to the product, "to plan" must include the drafting of specifications and setting goals in terms of planning, costs, budget, etc, even the term act may not sufficiently highlight the improvement it must be introduced at the end of the loop, also we limit ourselves to reviewing very quickly the inherent concepts Total quality management:

- Compliance with customer needs;
- Permanent improvement;
- The valuation of the staff;
- Recognition of merits;
- Measurement;
- Prevention.³

Let's take a closer look at three of these points:

Valuing the staff is based on him considering that it constitutes a wealth of business; it is taking into account all its potentialities to make live and evolve the company, for this it must be involved in all:

- Regarding the recognition of merits, the role of management is essential. Insofar as we involve the staff in a process of improvement permanent, the best way to recognize the merits is simply to show interest, satisfaction or dissatisfaction with work made by the different actors and mainly those of the working groups launched as part of the process of continuous improvement. The principle of give the opportunity to a working group to present the results of its work in front of management is essential from this point of view. This may be supplemented by bonuses or other types of reward, but provided whether they are collective, at the level of a working group, a sector of the company or the entire company.

Continuous improvement requires organization; it is on this point major that we will propose some methods, having recalled the principles it is necessary to move to the application, it must:

- Determine the processes;
- Write the procedures;
- Make live the plan of permanent improvement.

Furthermore we recall some basic challenges:

- Process: "A set of correlated or interactive activities that transform input elements in output elements."

ISO 9000: 2008 standard

And there are three categories of processes:

- Of management;
- Of realization;
- Or support.

Activity: Part of a process that transforms input elements into elements Release.

NOTE: Activity and process therefore have the same properties, we can write:

Activity = sub process

ISO 9000: 2008 standard

Procedure: Specified way to perform an activity or process.

Then it is useful to map the main processes, there are two examples, one for the design process and the other for the purchasing process, which are represented in the two corresponding chapters, we will here only propose the method to achieve such cartography:

- 1 - Define the main services or entities concerned, assigning a column for each.
- 2 - Place the different activities in the columns, in the form of a rectangle, with indication of the activity.
- 3 - Link activities with a representative trait of the relationship between activities, each line contains a flow of data and a direction of data flow, only represent the main data, otherwise the mapping risks look like a spider's web.
- 4 - Specify start and end point of the process with a rectangle in the customer column (internal or external).

It must now describe the activities, this includes for each activity:

- The input data and their sources;
- The output data and their destinations;
- Its description;
- Potential tools such as documents, forms, quality techniques, etc;
- Procedures knowing that a procedure may relate to several activities or even several processes;
- Quality records (EQR) according to the requirement of the standard

ISO 9001: 2008.⁴

In addition; the drafting of procedures is based on the following principles:

- Write thinking about who the document is for;
- Establish documents and implement them in groups involving the persons concerned;
Simplify drafting as much as possible, avoid big sentences:
 - A single idea in a sentence;
 - A single subject in a paragraph;
 - A single objective in a document;
 - do not write evidence or well-established practices; do not write what is the know-how.
 - Use graphs, tables, logigrammes, etc.
 - Get inspired by the "What, Who, When, How" that is the presentation having our preference.⁵

2- Total quality management principles:

Quality has become a vital obligation of competitiveness and durability of companies, it is an evolutionary concept, and it is dependent on the industrial evolutions, the economic movements and the history of societies. In reality, quality cannot be defined in itself or for oneself, but it always is for a client and better for him, quality is the set of characteristics of an entity that gives it the ability to meet needs expressed and implied, the concept of "Total Quality Management" in English "Total Quality Management, noted (T.Q.M) refers to the implementation of a business project based on a quality approach mobilizing all staff, an overall strategy by which the entire company makes every effort to satisfy its beneficiaries (quality, cost and time), the purpose of management by total quality therefore necessarily involves the development of a "Spirit quality" shared by all, when it comes to total quality, reference is made to a movement, to a stream of ideas that promotes research of the highest quality possible in any organization, a constant search for continuous improvement, which affects the aspects of the business and which is geared towards satisfying customer needs. Customers, their needs and expectations, constitute the ultimate reference for defining the quality sought for the product or service, to aim for total quality is to ensure that this goal is achieved in constantly improving all processes, internal and external, that contribute to the product or service, to achieve this, a systemic approach to organization and an approach are used, statistic for the diagnosis of its operating status, that is to say, the promoters of the total quality design the company as a complex and integrated system of functions and relationships whose operations and results can be analyzed using certain methods statistics, finally "Achieving perfect quality by reducing all types of losses and improving the deliverables of the company ", Finally, quality management is based on prediction and allows you to analyze and interpret observations instead of relying exclusively on experience, It is based on a deep knowledge system, The aim of the TQM is the satisfaction of all interested parties of the company.⁶

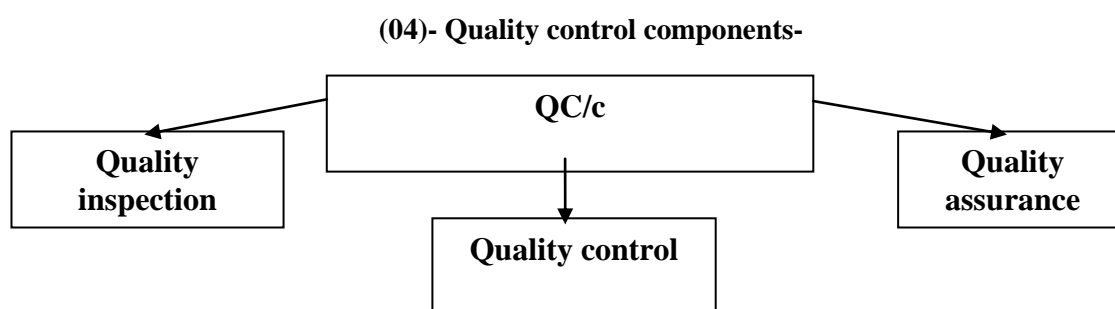
- Historical background to TQM:

Historically many scholars had defined TQM by focusing on the quality itself, which is way of being, good or bad, of something, and excellence superiority in something, way of being characteristic and conferring a greater or lesser value, also physical characteristic that determines the value of a person or a product.

It is the ability of a set of intrinsic characteristics to satisfy requirements, the most commonly accepted and widely used definition of the concept of quality is: "It is the ability of a product or service to meet the needs of users", the best definition in our view can only come from those who are considered the pioneers of quality management, thus, for ISHIKAWA, quality can only be defined in the words of the person who does it, for the worker: quality means "being proud of your work", for the manager of the company: the quality means the realization of the requested production. For the director of methods: the quality is the respect of the specifications, for the director of marketing: quality "is the best fit of the product to the expectations of the public, However, obtaining this quality assumes a cost that is called the cost of obtaining quality "COQ" In common sense, the quality is therefore a judgment made by someone compared to someone of other or in relation to something, others see quality as the set of properties and characteristics of a product or service that gives it the ability to meet expressed or implicit needs, also the quality is what gives satisfaction, while total means that each function implements its own entire means to improve quality (each function is involved throughout the product cycle), total quality is based on a stream of ideas whose goal is to

optimize quality in an organization, by adopting a constant or continuous improvement approach that affects all aspects of the business and is geared toward the satisfaction of customers, the optics product is based on the idea that the consumer prefers the product that offers the best performance.⁷

The history of quality management is part of the history of management, ancient civilizations first relied on art and crafts to support and improve the quality of productions within societies, the industrial revolution and mass consumption left to new management issues, more specifically to quality management in 1924 by Walter A. Shewhart who invented a method of controlling the quality of production using statistical methods, then during the Second World War William Edwards Deming used these methods for the manufacture of ammunition and other products of strategic importance, there is a difference between quality inspection, quality control, quality assurance and total quality, as the following figure explains:⁸



Source: GARETH. R, Quality Assurance, WHO, 2000, p 08

- Quality inspection: this is a routine control of the product or service rendered to service providers.
- Quality control: this phase, which began in the 1950s, saw the emergence of a control mode closely inspired by a Taylorist vision of the labor organization, a control that concretely assumes that the worker is kept in the role of simple performer. Quality control, which consists of measuring, examining, testing or sifting through
- Quality assurance: this phase began timidly in the 1960s and culminates in the 1980s thanks to the factors that marked the second half of the last century in this case (the expansion of markets, the rise of cultural and socio-economic world of work, information systems automation), it boils down to the set of pre-established and systematic actions needed to give the proper confidence that a product or service. The latter is the guarantee of maintaining a certain level of quality, according to the objectives. It aims to reassure the client about the quality of the company's service. It comes in the form of a written document, called "Quality Assurance Manual", summarizing the entire quality policy of the company.
- Total Quality Management (TQM): The phase of total quality management that began in the 1980s coincides with the remarkable growth of the Japanese economy, it is the management style of a quality-focused organization based on customer satisfaction and benefits for the organization's members and for society.

In addition there is another step which is the certification which consists of evaluating by external observers the quality systems set up in relation to normative references (ISO 9000), the particularity of certification is that it can represent a goal in itself, even the emergence of quality control in the 1930s to 1945 with the arrival of the current of thought that proposes new methods of work and organization to master the quality of products in

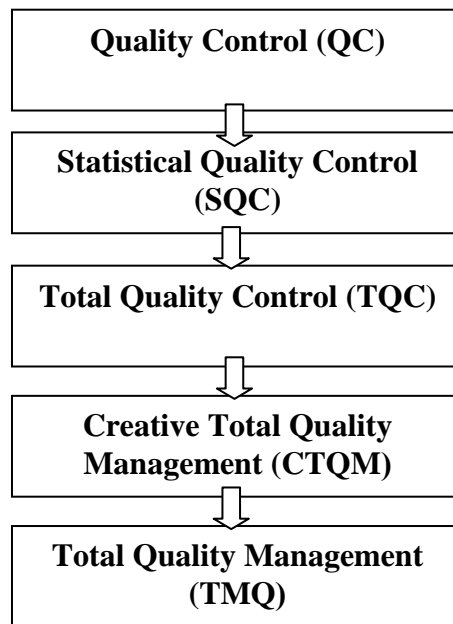
industrial enterprises, he was born into a well-known Bell Telephone Company in the USA led by "Shewart" whose name remains as the "Pope of Quality", "Shewart" is a mathematician of training proposed the idea of an organized control of products and services using statistics, the idea of an organized control, this control should be entrusted to services different from those who produced, thus were born the quality services, the conformity of the delivered products, an important event will then intervene in the 40s promoting the extension of the principles of Shewart throughout the American industry is the second world war which has led to a dissemination and generalization of statistical control techniques. Then it's the turn of Japan in the 50s and 60s that is the birth of the concepts total quality and quality assurance, quality will finally be a key parameter in the reconstruction of Japanese industry that came out of the war completely dismantled, this quality is introduced by foreign experts who are American and specially mandated by Mac Arthur to help Japanese industry.

In the 60s the emergence of the idea of total quality with fundamental principles such as (the participation of staff), Professor Ishikawa who is the "father of quality circles" with a new concept such as "trust" or "presumption" that the product to the required quality must be substantiated for a "demonstration" that must be made to any time, during the realization then during the existence of the product, describing from the beginning of the 60's of "myopia form" by the specialists of marketing, the generalization of total quality at the end of the 1970s in the West American companies are aware of the need to change their approach to quality and initiate approaches to total quality, during the 1980s, the movement towards quality is gaining momentum and many companies are moving in this direction by encouraging the participation and mobilization of the company's personnel, from the beginning of the nineties to the present day, the Total Quality Management (TQM), which emphasizes the real strategic preoccupations of the company (modes of technical and organizational actions) appears, thus, literally the "quality assurance" that is being implemented in many sectors is exploding, resulting in very innovative work organization arrangements such as the notion of responsible groups, automatic units appears as the mode of organization to adopt to implement in a more coherent and thorough way the total quality, finally we went from quality assurance to quality management, so progressively quality control (QC) was transformed into statistical quality control (SCQ), thus the "quality control" was limited to the inspection , at the entrance of the production process, leading to the rejection of defective parts and materials, then to the output of manufacturing by dismissing the products representing defects, then left room for total quality control (TCQ) which is finally extended to the TQM improving at all levels the performance of the management.⁹

In reality the T.Q.M concept started in the USA is applied in Japan in 1949 the founder of Toyota who asked his engineers Mr. Taiichi Ohno to find a variant of the Ford method more suited to the new social and economic environment. The latter has developed a method of which one of these main fundamentals is to reduce losses by achieving a perfect quality. Since the early 1980s, the method has become more popular especially in developed countries. The principle that started in the US because the big names of this current come from, the second is Japan because it was the main laboratory, If the ideas came from America, the concrete proof of their relevance was administered by the spectacular recovery of the Japanese economy of the 1950s, hence the idea of the Japanese miracle.¹⁰

And the following figure explains more:

(05) - Total quality management evolution –



Source: CONTI. T, *Op.cit.* p 127.

3- Total Quality Management and the health Sector:

In the 1980s, two distinctly different orientations were put in place:

The evaluation of the quality of professional practices and the assessment of the quality of care delivered within the hospital.

3-1- The quality of professional practices:

In this orientation, quality is seen under the prism of mastery of knowledge attached to each profession, the emergence of this theme of evaluation in the field of medical practices - and subsequently nurses - is linked to a series of American studies achieved in the 1970s, which show significant variations in the achievement of medical and surgical procedures, on these foundations, the movement of the evaluation of the quality of the professional practices developed in themes as diverse as prescription indications for specific acts such as x-rays thorax, nosocomial infections, or specific clinical areas. In this movement, it is interesting to note how quality justifies a concern about both the content of the expertise and the recognition professional status.

Thus, in the name of quality, physicians are interested in diseases ", and to define them medical teams use evaluation protocols clinical research, these protocols, which aim to demonstrate the effectiveness of an investigation diagnosis or treatment according to rigorous statistical methods, allow quality is thus used to promote professional expertise that is conceived, no longer from empirical evidence of a practice, but on the basis of scientific arguments, for nurses, the quality of care justifies the good progress of a gesture technique, here again, the control of these gestures devotes an expertise based on the expression of medical knowledge.

3-2- The quality of patient benefits:

The evaluation of hospital services comes to devote a vision bureaucratized quality in the sense that it is interpreted as the respect of rules the management team possibly in agreement with care professionals be deduced from legal texts, the common denominator of all these actions is to arrive at the definition of references to each of these levels, the "explicit quality standards", provided that a quantitative value is assigned to them.

Such an approach offers another interpretation of quality-based production on two main characteristics:

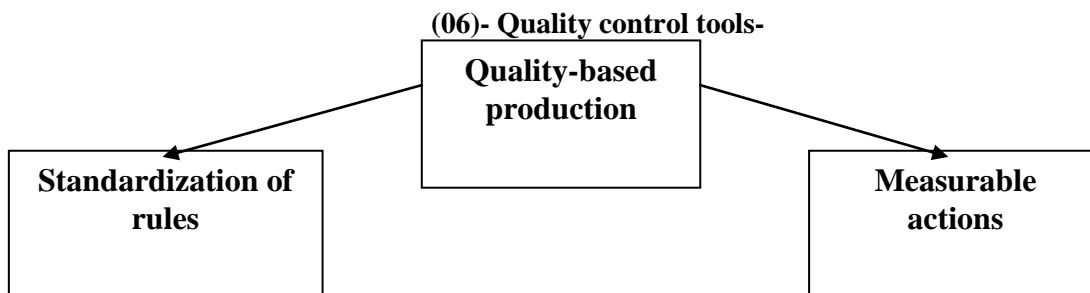
- The first is to favor the standardization of rules or standards:

All rules developed in the name of the assessment of the quality of services hospital are general; the quality assessment is done according to a principle of compliance with these.

- The second is to increase the weight of measurable actions:

Anything that is quantifiable should allow, by defining standards, to identify committed action and therefore to justify it, through these characteristics, quality comes to legitimize a form of management of the establishment, by offering evaluation tools based on compliance with criteria chosen because accessible to the measure and generalizable in all care units, the hospital management teams give themselves the ways to develop a centralized quality policy.¹¹

And the following figure explains more:



Source: ZHANG, H, *Implementation of total quality management*, University of Groningen, 2001, p 32

3-3- Professional practices at the organization:

Berwick and Schumacher are the first to emphasize the overly narrow nature of an approach focused exclusively on the analysis of Professional, by focusing quality on the design of therapeutic strategies, the whole implementation phase of these strategies is neglected even though complex, by reducing the notion of quality to a question of medical expertise, one neglects the activity of other professionals, or even the participation of the user who yet represent critical elements in the care process.

These criticisms are also based on classic findings in the industrial field:

Deming's claim that 15% of impairments are related to the technical expertise of professionals and the other 85% to organizational factors is to assert that the appearance of an anomaly is not solely due to the fact that professionals make mistakes, but also to the incapacity of the health institution taken as a whole to properly organize care.

3-4- Standard compliance and continuous improvement:

Such an approach may incorrectly associate this compliance with a performance level ideal, the risk of such an approach is to develop "minimum standards that allow for the delivery of minimal quality care, in structures that respect minimum standards, for results deemed acceptable ", in acting in this way, the pursuit of excellence is artificially curbed.

3-5- Strengthen and enhance the know-how of a service:

The ISO 9001 is more used service by service than in the whole of a health facility, observes among experts of the ISO 9001 of AFNOR Certification, essentially because the induced management method allows energy to be pooled and, through third-party certification, to recognize, within the hospital, the effective capacity of a service to improve patient satisfaction.

Services that have adopted this approach are very diverse: chemotherapy, radiotherapy, and orthopedics, medical assistance procreation services such as baby bottles or clinical trials also see an interest, many support activities also engage: equipment maintenance, laundry, cleaning, catering, shopping, training center, another example is the sterilization service, such as that at the hospital center, where Quality explained by when chose to start with sterilization to reinforce the processes and make tangible use of this essential activity in the operating room, this helps to reinforce the latter in its expertise and increase the trust that users place in it.¹²

3-6- Teams mobilized on the same objectives:

After the endoscopy service, it was the management of patients in interventional cardiology at the modern hospital, which obtained its ISO 9001 certificate, a first in western countries for a technical platform of this specialty, the quality approach, carried by highly committed people, drives the team towards performance, with a consequent culture of continuous improvement, rooted in everyday life.

The collective virtues of the gait are also observed in other modern hospitals, the impulse dynamic has led to the formalization of quality journals, which have become more frequent and more advanced, the professionals realized the importance of the customer-supplier relationship in the quality of service, and they were entitled to demand the best of them, it was a team effort that made it possible to obtain this result, at the hospital centers; the key to success is more than ever the solidarity between teams.¹³

Conclusion:

Total quality management is concerned with the quality of the organization's operations management, urging the involvement of all employees in their various categories, and promoting the work on the basis of what is known as the culture of quality, which focuses on providing performance completely error free, which improves the outputs and reduces the costs used in production, TQM is focused on the strategic adoption of management, so that it must be accepted by senior management, ISO is considered one of the most important pillars of quality measurement, over time, TQM has become a key element in improving the performance of health organizations in order to provide services, healthy products of better quality for patients at affordable prices.

Recommendations and suggestions:

TQM is working on a number of key points, especially in the health sector, which are as follows:

- Focus on continuous and periodic improvement of quality of health service;
- Focus on formation and training especially for health workers, including doctors;
- The ability to make good use of modern technology;
- Know where to locate errors and correct them immediately;
- Work to do periodic emulation of performance;
- Oriented towards rigorous specialization, in order to establish good responsibility and results of action;
- Focus on feedback on a daily basis to provide higher opportunities for improved performance;
- Strengthen capacity to compare with other private institutions, particularly in terms of performance outcomes;
- Provide greater opportunities for teamwork, and improve the performance of teams to contribute more to improving the results of the organization.

References:

- ¹ GOPAL. R.(2006), «Total quality management», Prentice Hall, New Delhi, p 02.
- ² KNOWLES. G.(2011), «Quality management», Book boon, UK, p 16.
- ³ BEHNAM. N.(2017), «Principles and Contributions of Total Quality Mangement», Department of Civil Engineering, De La Salle University, Manila, Philippines, p 09.
- ⁴ «Norm ISO 9001», (2008), Afnor. org, p 29.
- ⁵ LOUIS. L.(1986), «The three phases of change», Quality Progress, p 49.
- ⁶ MARTINS. R.(2000), «Total quality management programs», university of Sao Carlos press, Brazil, p 145
- ⁷ SENGE. P.(1999), «The fifth discipline», the art and practice of learning organization, Random house, London, p 13.
- ⁸ BRIGGS, R.(1996), «Analytical Quality Assurance in Water Quality Monitoring», World Health Organization, Geneva, p 15.
- ⁹ HARRIS. M.(1977), «Organizational Transitions: Managing Complex Change», Addison-Wesley, USA, p 07.
- ¹⁰ CONTI. T.(1995), «Total quality management», second edition, Chapman and Hall, London, P 127.
- ¹¹ MICHAEL. B. (1980), «Organization Change and Development - A Systems View», Goodyear Publishing Co, Cal, USA, p 37.
- ¹² FOSTER, M. (2010), «Keys for Successful Implementation of Total Quality Management in Hospitals», Health Care Manage Rev, USA, p 24.
- ¹³ MARTIN. L.(1993), «Total Quality Management in the Public Sector», National Productivity Review, USA, p 10.
- ¹⁴ DEMING. E.(1982), «Out of the crisis», MIT institute, Boston, USA, p 22.
- ¹⁵ GARETH. R. (2000) ., «Quality Assurance», WHO, p 08.
- ¹⁶ ZHANG, H.(2001), «Implementation of total quality management», University of Groningen publications, Netherlands, p 32.