KAIZEN METHOD FOCUSED ON PROCESSES WITHIN THE PRIVATE HEALTH SERVICE

MÉTODO KAIZEN ENFOCADO A PROCESOS DENTRO DEL SERVICIO DE SALUD PRIVADO

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ABSTRACT

This chapter puts forward the implementation of the Japanese philosophy "Kaizen" to apply in the processes of a private medical health service company, with the purpose of increasing quality and satisfaction. The study was developed with the identification of improvement points and priority projects for the company, subsequently it gave way to the creation of control charts by calculating the arithmetic mean ($\overline{X}$) and the range (R) of the service attention time with the collection of 100 samples. As a result, it was obtained that the processes are out of control against the changes that are derived from environmental variables.

Keywords. Kaizen; customer satisfaction; private health.

RESUMEN

Este capítulo plantea la implementación de la filosofía japonesa "Kaizen" para aplicar en los procesos de una empresa privada de servicios médicos de salud, con el propósito de incrementar la calidad y satisfacción. El estudio se desarrolló con la identificación de puntos de mejora y proyectos prioritarios para la empresa, posteriormente dio paso a la creación de cuadros de control mediante el cálculo de la media aritmética ($\overline{X}$) y el rango (R) del tiempo de atención del servicio con la recogida de 100 muestras. Como resultado, se obtuvo que los procesos están fuera de control frente a los cambios que se derivan de las variables ambientales.

Palabras clave. Kaizen; satisfacción del cliente; salud privada.

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INTRODUCTION

Mexico is going through a scientific, economic, and cultural transformation in the health section. All these changes have a great impact on the health industry since they increase social demand for health care providers. This also generates a constant demand towards an ethical and professional environment where there are greater demands, controls, conflicts and, consequently, a frustration increase (Gómez, 2014).

The right to health protection is one of the social rights based on the fourth paragraph of article 4th of the Mexican Constitution, which states that "all men and women are equal under the law". Amongst other issues, this article also grants all Mexican People health care, and the Government is responsible to provide assistance to anyone who requires it, regardless of their economic background and or their ability to pay for these services (National Autonomous University of Mexico, 2013).

This right is exercised by a large majority of the Mexican population, one of the health departments responsible to provide these services is Seguro Social which serves all Mexicans (Olaiz et al. 1995). According a bulletin by Universidad Nacional Autónoma de México (UNAM, 2019), more than 50% of Mexicans have social security and up to a third of them utilize the private health service. This bulletin also states that private medicine in Mexico requires regulation, these private Institutions are not exempt from applying strategic planning for continuous improvement and complying with the quality standards required by law to provide a health service, which is currently extremely difficult to provide due to the coronavirus presence, the result of a contagion originated in China (Bai et al. 2020) and this has health professionals around the world on alert because of the amount of deaths it has caused.

Hernández, and Alcantára (2015) point out that patient safety and the quality of medical care has become a constant concern for the National Health System, reason for the creation and implementation of evaluation strategies and processes such as the creation of Comité de Calidad y Seguridad del Paciente (COCASEP). In 1996, the Comisión Nacional de Arbitraje Médico (CONAMED) was created as a follow-up to the issue of evaluating and guiding continuous quality improvement in medical care. Focused on quality from the perspective of quality failures identified in patient complaints and service dissatisfaction (Neri and Aguirre, 2015).

As an example of the above, Rodríguez et al. (2010) consider that by 2025 our country will have a total of approximately 11.7 million diabetics, a health condition that currently accelerates the aging and death of the population, which leads to a great economic impact.

Health services are increasingly pressured by high of profitability, solvency and quality with the help of input costs, financial costs and oversaturation by social demands that form a barrier to offer their service under the achievement of total user satisfaction. Therefore, they are on the lookout for tools and methodologies that allow them to manage better levels of profitability solvency, and quality with the help of evaluation processes. This study aims to implement administrative methodologies to achieve private medical service improvement taking the Kaizen philosophy as a guide through which it is intended to increase the levels of satisfaction, production, and cost reduction for a better service.The implementation of small provisions enhances procedures efficiency, creating an organizational culture that ensures the continuity of contributions and the effective participation of workers in a permanent search for solutions, especially in the face of the health crisis that humanity is currently going through because of the pandemic.

THEORETICAL FRAMEWORKS

• Japanese administration

Japan was one of the countries that the Second

World War left in a great state of fragility with exuberant losses in population, political and economic power. Due to this, the Japanese began a reconstruction process focusing on all areas; these changes were the basis for growth, mainly in industries, which exceeded that of the times before the dispute.

They proved to be a territory capable of resurfacing and positioning itself as a world power, capturing the attention of neighboring countries interested in reproducing their innovative practices in the search for high standards of quality and productivity in organizations. It is now, when the focus is on Japanese culture, investigating the art of management and administration (Muñoz, 2014).

Knowledge is currently shared about implicit control mechanisms through various research papers published around the world (Abegglen, 1958; Aoki, 1990, Codina, 2009). In industrial practice, imitating these actions is allowing us to improve by increasing the profitability of organizations.

Continuing with the theory of Japanese administration, when starting the process of adaptation in a company it can be identified the 2 most conventional styles of change (Yacuzzi, 2006). The first (mechanical adaptation) is made up of a pattern of actions based on American philosophy, preferably used in a low-variable market, developed in a cold environment with hostile competition. On the other hand, under the opposite conditions, the second style (organic adaptation) inspired by the socio-cultural factors of the Japanese is applied.

It should be noted that the final choice between styles depends largely on the environment in which the company develops. As the first one focuses on the aspects related to the product, in the USA there is a strong tendency towards bureaucratic dynamics, on the other hand, Japanese's is oriented towards production and group dynamics in processes.

• Kaizen method

It is always possible to make quality changes within any organization; the focus of this is to ensure the commitment of good management, thus managing to cope with a teamwork focused on improvement. This leads to involving and motivating people during the process, encouraging them to maintain a position aligned with the company's philosophy, a team that seeks to obtain positive results. For this, senior management must act as an entity committed to promoting changes based on the projection of organization, strategic planning and execution (Felizzola and Luna, 2014).

In this way, organizations resort to the application of methodologies and tools that allow them to achieve their goals. The Kaizen method is considered a strategy that concentres on strengths, increases competitiveness, and generates profitability (Montalvo, 2011). The word is derived from two ideograms of Japanese origin: Kai (change) and Zen (good) (Suárez and Miguel, 2011), forming the phrase of continuous improvement or change for the best. This philosophy mandates that actions need to be taken to have continuous improvement where all employees participate and apply this transformation in all company departments, regardless of the context, and or scope. It begins with small changes until radical innovations are achieved.

The concept of evolution that it presents can be applied both in a factory and in an office, creating improvements and innovating in the activities of daily operational processes. To fully understand the method, it is necessary to know about the principle of the 3 gens or the 3 realities; in the data in Table X.1 the characteristics are summarized.

Table 1 Principle of the 3 Gen

Gemba (Real place) 現	Gembutsu (Real product) 現場	Genjitsu (Real data) 現物
Place where the work is done and where the changes will take place.	Personal experimentation of the processes.	Obtain facts or statistical data that allow us to understand reality.
It is essential to know the precise place, context and conditions.	Close live and direct problems on the floor by the staff. Avoid intermediaries and subjective opinions.	Creation of an objective interpretation.

Kaizen represents a culture for employees, in which they look daily for possible better processes with cost reduction, quality improvement and customer service (Sejzer, 2019). In addition, this method requires the systematic and interrelated application of activities and instruments to increase the profitability of the company. Among its main tools, the following stand out (Lefcovich, 2004):Total Quality Management, Quality Circles, Suggestions and / or Alerts System Automation, Total Productive Maintenance, Energy Management, Kanban, Customer Satisfaction, Just in Time, Zero Defects, Single Minute Exchange of Die, Productivity and Administrative Quality, Service Design, Kaizen Cost and Effective Teamwork Management

To achieve success with the implementation of the Kaizen method, certain systems will be selected, which comply with the validity to be developed in any company that provides goods services.

Total Quality Management

It is considered a philosophy that seeks to be spread throughout the organizations. It is oriented to quality through conceptual growth and the achievement of its objectives reaching the level of global strategy. The term "total quality" arises from this, where it is not limited to improvements in production, but also integrates aspects of human resource management, processes, methods and overall organization (Cuatrecasas and Gonzales, 2017).

It also seeks that the company creates its own competitive advantage, establishing its full attention towards obtaining full satisfaction of internal and or external customer needs and expectations. In order for this satisfaction to be achieved, it is responsible for intervening during the entire product design and development which allows them to accomplish high quality at very low production costs. It incorporates its own techniques as quality tools of the future:

The Quality Function Deployment (QFD) is applied in 4 phases of the process: product planning, component deployment, process planning and production planning. Part of the knowledge of the client and the demand, collecting, analyzing and treating the consumer expectations by creating a list with all necessary traits to fulfill all the products and or services demands. The data collected proceed to be ranked according to the coefficient of relative importance of the requirements on a scale of 1 to 5 (Cuatrecasas, 2012).

Just In Time

It arises under the Japanese socio-cultural philosophy and due to the context of its construction; it was specially designed to generate maximum use of existing resources. Through its conception and practice, Japan was able to identify the importance in the optimal cost-quality ratio, driven by finding alternatives for improvement in its processes even undergoing the strong economic recession at the end of the Second World War. It is considered a friendly strategy with other production strategies, especially those focused on reducing cost (Muñoz, 2014). It gained notoriety after the oil crisis of 1973, an event that produces with losses to Japanese companies.

For Chase (2001), Just in Time (JIT) is a set of activities that focus on achieving high production volume demanding minimum inventories of raw materials, work in progress and finished

products. That is, the product is produced until it has a real demand, quickly complementing the operation and achieving a final assembly. This in turn brings consequences because it gives way to a dependency between each process of the supply chain, where if any element presents inconveniences it can stop the whole process.

It consists of a collection of applicable techniques for improvement: Kanban cards, Single Minute Exchange of Die, mathematical methods of product sequencing to balance loads in the various workshops, among others. There are different approaches to JIT, which despite being similar in their conclusions, they have different marches. The most recurrent are: zero stock - not having warehouses and producing at the time of consumption-, elimination of waste-, limiting adding value to everything that is not useful and generating superfluous costs- and reducing time- orienting to carry out any action in the instant, placing time as a key variable- (Gómez, 2014).

His techniques are applicable both in the manufacturing industry and in the service industry. For example, in the second one, it is possible to focus on the waste of time during the activities, the misuse of office supplies and tools in educational or health companies, loss of time in performing tasks in a bank, or over stock in shoe store. Regardless of whether it is the production of goods or services, the following list presents the most significant tasks: overproduction, waste of time in machinery handling, waste of transport time, waste of processing time, waste of inventory time, waste of time in movements, waste in defective production.

Kanban

The Kanban system originated in 1956, the renowned automotive company Toyota began to implement it with the purpose of creating a competitive advantage over other companies such as: Ford and Chevrolet in the international market. It focuses on offering strategies to streamline processes in production and delivery, managing the time on each sequence (Pinto, 2015).

With its application, Toyota managed to identify the waste generated during production, giving way to establish the principles or rules of the Kanban system: visualization, quality, waste reduction, prioritization, in process and continuous improvement. In addition, it represents an important tool in the development of Just in Time systems, as it helps to control the manufacturing process step by step with the help of quality and time indicators, it is generally applied in factories of industrial or commercial business.

Castellano (2019) points out that it is necessary for companies that wish to apply this methodology, to handle a full-type production control system. As well as under regular customer demand, low product variation and rapid changes. According to Arce (2014) there are two types of the Japanese system:

Kanban of production: Generally used to specify the transport of a certain amount of material for a next process.

Kanban retirement: By which signal is emitted before the need to move from one side to another in continuous flow productions facilities or assembly lines.

In addition, it does not require large investments to obtain successful results in the manufacturing area; just follow a series of rules on which the methodology is based (Arango, Campuzano and Zapata, 2015, p.225):

1. Defective product should not be sent to subsequent processes.
2. Subsequent processes will require only what is necessary.
3. Produce only the exact amount required by the subsequent process.
4. Balance the production.
5. Kanban is a means to avoid speculation.
6. Stabilize and rationalize the process.

The Kanban system train workers and provides them with the ability to adapt to dynamics and chance (Angeles, 2006).

Single Minute Exchange of Die

It is a system used for the reduction of preparation times, makes use of quality techniques to solve problems such as: Pareto analysis, its principle states that 80% of the problems are caused by 20% of the causes (Ruiz, 2009) and the six classic questions: What? - How? - Where? - Who? - When? – Why? used to detect possibilities of change, simplification or elimination of tasks to identify the cause of high preparation times or changes in techniques (Hernández and Vizán, 2013).

Companies that wish to implement SMED need time and movement studies related to preparation activities. Which are included in 4 different phases:

• **Phase 1:** Differentiation of external and internal preparation. Its objective is to separate both phases to convert as much as possible of the internal preparation into external preparation.
• **Phase 2:** Reduce internal preparation time by improving operations. Internal preparations not converted to external will be subject to continuous improvement and control.
• **Phase 3:** Reduce internal preparation time by improving equipment. It focuses on improving equipment, modifying structure, designing techniques or incorporating devices to machines.
• **Phase 4:** Zero preparation. The goal is to use appropriate technologies and flexible device designs to achieve the ideal preparation time: zero.

With the reduction of time, the overall efficiency of the plant and productivity are increased, obtaining a greater number of manufactured parts, greater use of the equipment and reduction of stock levels (Pertuz, 2018). From the first application of the SMED, it is especially important to follow up to detect possible deviations and take corrective actions.

• Control of the Statistical Process

The SPC consists of collecting, analyzing and interpreting quality related data. In the same way, it functions as a competent tool in the comparison of performance and verification in deviations with the purpose of proposing activities aimed at the improvement and quality control of products, services and diagnosis of defects (Hernández and Da Silva, 2016). In addition, it allows lower costs, reduction in the number of defective parts in the production line and allows predicting performance in future executions.

This statistical instrument of monitoring and control is used in order to reduce the altered values, according to Kume (2006) it is impossible to obtain constant data in a process, since all would have the same value. He also points out that factors considered constant, but not exact, the values are always altered but that does not limit that they follow a certain distribution. To prevent the development of poor products or services, the philosophy of total quality management is applied. During the whole process the phenomenon known as variability is presented.

In production, variability is frequently used as a key indicator, this will allow to measure the capacity of the processes to meet the required quality. As they are repeated, some performance characteristic with the presence of variability can be observed. However, the existence of this will not entail great value, if it is controlled to avoid frequent delivery of non-conforming results.

Among the main factors that affect the presence of the phenomenon is the machinery or tools, making a result not always standardized. The raw material in the same way is a limitation that hardly presents similar characteristics, and finally, the human factor, this depends on external and internal circumstances that affect its proper functioning. The variables are obtained through quantitative data with the measurement of specific characteristics. In addition, with the implementation of the SPC the information can be

analyzed, it is possible to discover the presence of assignable causes by creating control charts (Ruiz, 2006).

Control panel or control diagram

It is a tool that excelled during World War II as a technique of sampling and statistical analysis; it defines quantitatively the range of acceptable variation with respect to an average value. The graph shows visually how production is developed based on an average of an upper limit and a lower limit to guide decision making, in the same way it provides valuable information that allows staff to anticipate the loss of statistical control.

The process of preparing a control chart is similar to that of a hypothesis test; both are initially integrated by a null hypothesis (H0) and an alternative hypothesis (H1). It provides relevant preventive information that will serve as a guide for the company, which must follow the following steps for its conception.

1. Sample of small samples during the process
2. Calculation of the sample means
3. Graph the sample means
4. Calculation of control limits and center line
5. Graph control limits
6. Detection of an out of control state
7. Identification of special causes of variation
8. Correction of the causes found (Manrique, 2014).

The objective is to obtain samples of the production process to generate graphs that indicate its variability, also to check if the results meet the established specifications. The graph is composed of 3 central lines, where the central line indicates the average value of the quality and the other 2 lines represent the upper limit and the lower control limit, positioning at a certain distance.

These limits were established to measure the processes with greater control, foreseeing most of the sample points within the range. If a point exceeds the lines it will show that the process is out of control, even if all the points are within the established ranges but behave in a systematic or non-random way, they will have the same meaning. During an interpretation it is important to consider that the graphics are susceptible to false alarm when signaling an out-of-control state when the process is optimal (Arvelo, 2006).

Within the formula the mean of the sample is represented by the symbol $\overline{X}$, (See equation 1 and the range of the sample with R (See equation 2). It is commonly used for its ease of calculation; it is recommended when the size of the subgroup´s "n" is small.

$\overline{X}$Chart Control limits (Equation 1)$UCL=\overline{X} + A_2 \overline{R}$

$LCL= \overline{X} - A_2 \overline{R}$

R Chart Control Limits (Equation 2)

$UCL= D_4 \overline{R}$

$LCL= D_3 \overline{R}$

• Health System

The Mexican health system is classified into two sectors: 1) Public service, composed of social security institutions. Among them, el Instituto Mexicano del Seguro Social (IMSS), el Instituto de Seguridad y Servicios Sociales de los Trabajadores del Estado (ISSSTE), Petróleos Mexicanos (PEMEX), among others, stand out for their high demand. In the private service are insurance companies, clinics, private hospitals and alternative medicine services (Gómez, et al, 2011).

The high demand in public health institutions is undeniable, as it is a free service to which the inhabitant becomes entitled by right and that currently with the arrival of COVID-19, laboratories belonging to this group have the task of diagnosing it. (Martínez, Ramos and Vidaltamayo, 2020).

With respect to the preference of consumption in the service, in previous investigations the private sector exceeds customer satisfaction percentages.

And it is that although it is difficult to measure the perception of quality in a service, public opinion plays a key role in obtaining and analyzing such information.

For the World Health Organization (WHO):

Health care is to ensure that each patient receives the most appropriate set of diagnostic and therapeutic means to achieve optimal health, taking into account all the factors and knowledge of the patient and the medical service to achieve the minimum risk of adverse effects and maximum patient satisfaction with the process (Outomuro and Mariel, 2013).

An investigation carried out in Greece indicates that although the patients respond positively to the treatment given by doctors and nurses, in the private service they obtained a better experience thanks to the physical facilities and the shorter waiting time. In South Africa, the empathy of the human resource has a positive impact on the consumption of private service and in Singapore, it highlighted the lack of security, reliability and customer service during the consumption of the public health service (Aravena and Inostroza, 2015).

On the other hand, the cost is continuously indicated as a demotivating factor of consumption in the private sector. Since the 1970s, private companies that offer this service have worked to strengthen their offer by improving infrastructure and including technological equipment. However, increase affects final prices in the same proportion (Zurita and Ramírez, 2013).

Concern about the quality of medical services has existed since earlier times. Various factors are what influence the public to direct their attention towards various problems, such as: the increase in costs and demands for medical malpractice, as they generate an alert posture in patients (Suástegui, Ramírez and Ibarra, 2011). With the implementation of human resources for the administration and direction of organizations, a new orientation in the service is expected.

METHODOLOGY

The realization of an in-depth analysis of the general aspects that can be presented in the facilities of a medical office are of vital importance. Since with this it is possible to determine the actions to take before the problematic arises is presented due to the bad time management. The present study proposes the implementation of the Kaizen philosophy, through the selection of tools, compatible with the focus on improvement exposed by the situational analysis of the company.

Through the creation of an Input-Process-Output (IPO) diagram, the identification of the order of execution of a process can be represented in a modular way, following a logical information flow (Peña, 2011). According to the exposed data (see Figure 1) we proceed to the identification of improvement foci and projects identified to make changes regarding the continuous improvement and quality in the processes (see Table 2).

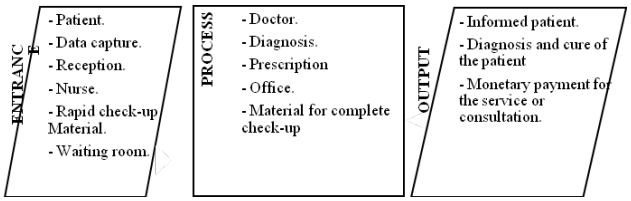

Figure 1 IPO diagram Input-Process-Output

• Interpretation

The inputs are is all that tangible and intangible matter that allows to carry out the process, at this stage are located: the patient, person who demands medical attention; reception, first contact area where the first data and vital signs of the patient are taken with the help of the rapid check-up material; the waiting room, waiting space provided for patients in the waiting periods of the service; and nurse, personnel in charge of the activity corresponding to the first check-ups and data capture.

The process is the transformation of all the com-

ponents included in the input stage and represents the operations carried out to achieve the results. Within this stage are located: the doctor, staff responsible for providing medical care that has the knowledge of the area; diagnosis, is the analysis of the patient's health status obtained through a prior exchange of information; prescription, format given by the doctor as a result of the diagnosis; office, central area in which the service is developed; material for complete check-up, unlike the aforementioned, it includes the work tools to which only the personnel in charge have access.

The output refers to the result of the process; this stage includes the informed patient, diagnosis and cure of the patient. Also, the monetary payment of the service or consultation.

The key to generate improvement is to identify the need for the process, if no focus of improvement is recognized neither the need of changes. Therefore, there would be an incompatibility with the implementation of Kaizen, since its philosophy is the search for continuous improvement. For the purposes of the study, the development aspect of the methodology is: Kaizen of time.

Just in Time is a strategic resource to achieve greater speed in the processes, creating a competitive advantage in the market. One of its main elements is the elimination of activities that do not add value, through the JIT the inefficiencies in production are fought and the complexity of the company's computer system increases. Within the 7 statistical tools of quality management are statistical control charts, used to control the trends and stability of an analytical process. Through the collection of 100 samples during the health care service, it will be sought to determine the variability of the process and whether it is in control.

RESULTS

Situation of a service provider: private medical office (Consultorio Las Torres, S.A.).

As an opening of the section, we intend to share a vision of the current state of the private medical service to put the reader in context for the understanding of this study.

Consultorio Las Torres is a company dedicated to the health service in the private sector, serving the general public that demands attention regarding the monitoring of health, accidents and diseases. The idea of conception arises in 1989; two years later it opens its doors in the capital of the state of Tabasco, Mexico. During its first 10 years it was positioned among the best private practices in the area for its outstanding customer service, staff training, quality service and location of the premises. In the middle of the year 2000 it suffered his first economic crisis after administrative problems, a factor that led the company to the change of location, budget cuts and layoffs.

Currently after 30 years of experience and many changes in the structure of the company, it has a total of 10 employees working in the morning and evening hours. Its main services are directed to the treatment of diabetic patients, infants and persons of legal age. It limits its attention to minor surgery, births and medical consultation. Despite the lack of marketing practices, it has a stable positioning in the minds of consumers due to the professional career of the staff.

Among the biggest challenges presented by the company is the competition in the market, there are private medical services that provide care for a lower cost and less time in the consultation (between 12 to 20 minutes approximately.).Patients continually expose staff to their disagreements regarding the waiting period between each turn; It is essential to remember that heterogeneity is found within the 4 characteristics of a service (Corea and Gomez, 2014), so it automatically becomes a difficult factor to control for service providers.

As a measure to meet the challenges of the Las Torres office, a list was prepared (see Table X.2) with the focus of improvement and projects iden-

tified to make changes within the processes carried out in the company. Based on the opinion of internal and external clients, quality control tools and statistical methods for solving the problem are planned.

Table 2 Identification of improvement focus and projects.

Spotlights for improvement	Projects identified
Excessive time (consultation)	Decrease in downtime due to lack of calculations. Reduction of waiting time for consultation due to poor organization.
Organizational problems in reception area	Reduction of customer complaints towards the reception area. Increase in satisfaction.
Failure in the distribution of human resources	Decrease in dead time.
Bad distribution of areas	Maximum customer comfort. Decrease of spaces. Ease of movement of staff and customers.

Time was measured during 100 medical consultations as part of attention to the focus of improvement number 1 (See Table 2). The data collection time consisted of 2 weeks of operation, considering only the business days of the company. To reduce the possibility of bias in the process, the data obtained were collected with a digital stopwatch at the beginning and end of the first 10 appointments of each day within the morning work shift. (See Table 3).

Table 3 Medical consultation time
Duration of medical consultation (in minutes)

Appointment	1	2	3	4	5	6	7	8	9	10
Monday	24	27	32	26	29	26	33	31	25	28
Tuesday	29	26	31	31	33	29	26	32	34	27
Wednesday	22	24	21	26	24	22	20	27	23	26
Thursday	25	28	33	24	23	27	27	30	29	28
Friday	21	27	23	26	30	24	30	26	25	26
Monday	23	23	28	22	25	26	22	29	28	23
Tuesday	30	26	22	27	23	31	29	31	24	25
Wednesday	20	24	23	25	22	20	26	21	21	24
Thursday	26	28	26	23	29	32	25	27	24	29
Friday	25	32	28	24	30	29	22	26	23	27

For the calculation of the arithmetic mean ($\bar{x}$) and the range (R) in the time of attention of the private medical service, electronic sheets were used through the Excel sofware. To obtain A2, D3 and D4, a table of coefficients (Ruiz, 2006) was consulted as a reference, which determines the values according to the number of samples in the process. (See Table 4)

Table 4 Means and ranges
Medical appointment duration

Sample	1	2	3	4	5	6	7	8	9	10		
Monday	24	27	32	26	29	26	33	31	25	28	28	9
Tuesday	29	26	31	31	33	29	26	32	34	27	30	8
Wednesday	22	24	21	26	24	22	20	27	23	26	24	7
Thursday	25	28	33	24	23	27	27	30	29	28	27	10
Friday	21	27	23	26	30	24	30	26	25	26	26	9
Monday	23	23	28	22	25	26	22	29	28	23	25	7
Tuesday	30	26	22	27	23	31	29	31	24	25	27	9
Wednesday	20	24	23	25	22	20	26	21	21	24	23	6
Thursday	26	28	26	23	29	32	25	27	24	29	27	9
Friday	25	32	28	24	30	29	22	26	23	27	27	10
											26	8.4

These data allowed the calculation of the limits of time control in the care of the private medical service. The Upper Control Limit (UCL), Central Limit (CL) and Lower Control Limit (LCP) were obtained (see figure 1):

Figure 1

x-bar chart	
Limits	Values
LCL	23.6528
X bar	26
UCL	28.8272

R chart	
Limits	Values
LCL	1.8732
R-bar	8.4
UCL	14.9268

para N=10	
Constants	values
D4	1.777
D3	0.223
A2	0.308

Control charts

were formed to measure time in the service. (See Figure 2)

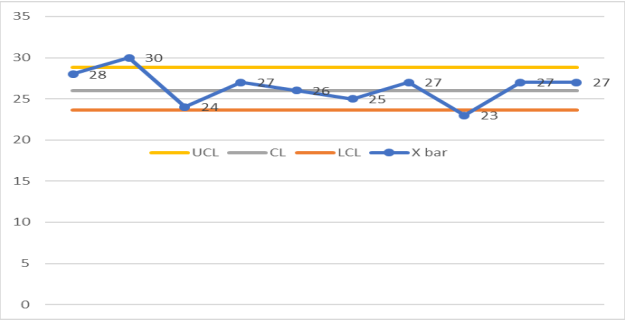

Figure 2 X-bar chart control. Measurement of time in service

At first glance it can be seen that the process is out of control. The points of the second and third sample mean are located outside the upper limit and the point of the octave sample average exceeds the lower limit. To demonstrate a process in control it is necessary that the time range in the medical consultation varies between 24 and 29 minutes, with an average of 26 minutes. (See Figure .2)

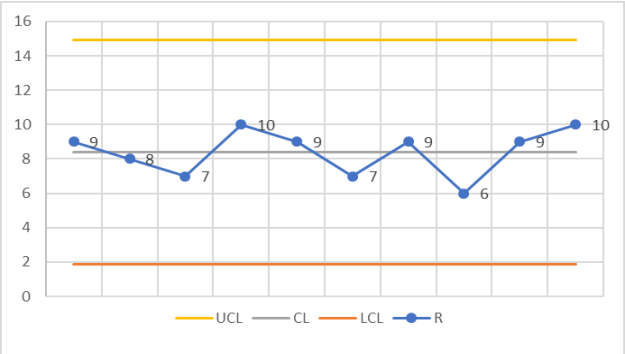

Figure 3 R Chart control

Figure 3 shows the variation time in each medical consultation is very different from the range, similar to the average amount, either higher or lower on any day of the week. According to the results revealed, it can be deduced that the process is in control, since there are no variations of assignable cause, that is, all the points are within the control limits.

CONCLUSIONS

The management and quality control insights are given by the incidents analysis of the organization process. The functions of a medical office are subject to the attention capacity that can be generated in a productive day, as well as the control over these. It is determined that with help of the control graphs it is possible to analyze and determine how variable the process is before the changes that are derived from environment variables.

With the implementation of the Kaizen methodology it was possible to identify improvement points that the company has.

Continuous improvement should be considered not only for the economic benefits in reducing costs, but also for the human beings.

Applying the Just in Time method allows the company to be more efficient in its operations, therefore, it will achieve a greater customers satisfied with the quality of the service and a notable increase in sales. It is essential that staff be trained and motivated to lead for optimal workforce performance. The graphics are very useful for controlling trends and stability and in an analytical process they show the instability of the process. The results showed that the medical care process is out of control, exceeding lower and upper bounds.

Continually carry out feedback and follow-up to detect new areas with deficiencies, apply the ideal tools and strengthen the company's system.

The present investigation was carried out as an analytical contribution, extending an invitation to continue the application of tools for the solution of critical focus in the same case or similar ones continuing with the practice in this subject.

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