

ORGANIZATIONAL CULTURE AND QUALITY PRACTICES TQM / SIX SIGMA: A STUDY IN MANIPULATION PHARMACIESDmitryev Cyreneu Silva¹, Marcel Lima Ribeiro Dantas¹, Diego Philipe Oliveira Godeiro^{1*}¹ Graduate Program in Administration, Building of the Center for Applied Social Sciences, University Campus, Lagoa Nova, P.O. Box 1620, 59072-970, Natal, RN, Brazil*diegophilipe@imd.ufrn.br

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ABSTRACT

This paper presents a strategic analysis of the importance of the relationship between organizational culture and the implementation of quality management programs, such as Total Quality Management (TQM) and Six Sigma. Therefore, an exploratory-descriptive and correlational study was carried out in a sample composed by forty compounding pharmacies in the state of Rio Grande do Norte. The data collection identified characteristics of the companies and the level of use of quality practices, which were in turn identified in the literature. In order to evaluate the organizational culture, it was used the Competitive Values Model, considered an instrument of high academic and professional value. The results reveal the different effects of the types of culture in the adoption of quality practices and suggest that Clan and Innovative Cultures are the ones that best represent the cultural profile of pharmacies and are also more positively associated to the quality practices that the Market Cultures and Hierarchical. Understanding the advantages of each type of culture should help managers to effectively achieve the implementation of a quality management program from a holistic view of quality and culture management.

KEYWORD: quality; quality practices; TQM; Six Sigma; organizational culture.**CULTURA ORGANIZACIONAL E PRÁTICAS DE QUALIDADE TQM/SEIS SIGMA: UM ESTUDO EM FARMÁCIAS DE MANIPULAÇÃO****RESUMO**

Este trabalho apresenta uma análise estratégica da importância da relação existente entre a cultura organizacional e a implementação dos programas de gestão da qualidade, tais como *Total Quality Management* (TQM) e o Seis Sigma. Para tanto, realizou-se um estudo exploratório-descritivo e correlacional em uma amostra composta por quarenta farmácias de manipulação do estado do Rio Grande do Norte. A coleta dos dados identificou características das empresas e o nível de utilização das práticas de qualidade, que foram por sua vez identificadas na literatura. Para avaliação da cultura organizacional utilizou-se o Modelo dos Valores Competitivos, considerado um instrumento de alto valor acadêmico e profissional. Os resultados revelam os diferentes efeitos dos tipos de cultura na adoção de práticas de qualidade e sugerem que as Culturas Clã e Inovadora são as que melhor representam o perfil cultural das farmácias e ainda estão mais associadas de forma positiva às práticas de qualidade que as Culturas Mercado e Hierárquica. O entendimento das vantagens de cada tipo de cultura deve ajudar os gestores para que alcancem com eficácia a implementação de um programa de gestão da qualidade a partir de uma visão holística da gestão da qualidade e cultura.

PALAVRAS CHAVE: qualidade; práticas de qualidade; TQM; Seis Sigma; cultura organizacional.

1. INTRODUCTION

The economical activities are going through an important time, in which breaking barriers and globalization reinforce the quality as an essential corporate change agent of our time. A quality management system implemented effectively contributes to achieving competitiveness in organizations. In this case, only the allocation of adequate financial and technological resources does not guarantee such effectiveness (DEMING, 1990). The individual now has a relevant role in the context of quality and the need to provide and maintain the continuous improvement of the systems implemented by senior management who also requires the ability to perform and lead organizational change, abandoning the old way of performing the tasks and adopting practices that provide better results.

Some initiatives such as TQM (Total Quality Management), Six Sigma and ISO 9000 meet these expectations and at the same time they are strategic management tools that have been adopted by companies, revolutionizing business in the corporations and reaching the level of quality required by customers (ECKES, 2001). At the same time, to be successful, they require a cultural change in the organization, and it is often necessary to reformulate the business organization and the work model, in other words, companies should break paradigms and often abandon their behavioral patterns (ARIENTE *et al.*, 2005; REBELATO; OLIVEIRA, 2006).

Getting to know the current culture helps in the implementation and assures how successful the strategy of quality is (ZU, FRENDEDALL, ROBBINS, 2006; ZU, FRENDEDALL, ROBBINS, 2010; ECKES, 2001; DAHLGAARD; DAHLGAARD-PARK, 2006; DAVISON; AL-SHAGHANA, 2007; CORONADO; ANTONY, 2002; WATSON; GRYNA, 2006). According to Shein (2001), culture determines the strategy, the objectives and mode of operation of an organization, and it is vital to know it and evaluate it to understand its role in the organization. When one takes culture into consideration, it is possible to anticipate the consequences and choose. According to Cameron and Quinn (2006) organizational culture must first be diagnosed and then changed. According to Zu, Frenedall and Robbins (2006) and Zu, Frenedall and Robbins (2010), several studies have used this model to identify the ideal culture profile for the implementation of quality programs such as Six Sigma and TQM (MAUL, BROWN, CLIFFE, 2001; SHARMA; SHARMA, 2014).

While the comparative analysis between Six Sigma and TQM has been extensively studied in the literature, there is still a shortage of research that addresses these programs related to culture (DAHLGAARD; DAHLGAARD-PARK, 2006; ROBELATO; RODRIGUES, 2010). Pinto, Carvalho and Lee (2006), Zu, Frenedall and Robbins (2010) and Sharma and Sharma (2014) have emphasized the importance of business adequacy for continuous improvement programs, raising questions such as what type of organizations can successfully adopt the program, what changes in culture and structure are necessary

Another important factor is that following the model adopted in other countries, the use of quality programs is focused in large corporations in Brazil. Although the interest of executives has aroused with the financial results achieved, the high investments required have not allowed the distribution of this technology among the majority of national companies, which are predominantly of small and medium-sized ones (PINHO, 2005). According to data from the Annual Social Information Report (RAIS - MTE, 2006), in Brazil nearly 99% of the companies can be classified as micro, small or medium size and employ around 60% of the people, constituting an important source of jobs and wealth. Therefore, considering the specific cultural characteristics in small businesses, a study on the implementation of quality management in these companies can bring significant results for the national economy, which are the issues that motivated the authors to do this scientific research.

The companies here addressed were the compounding pharmacies, which are part of the retail trade of pharmaceutical products in the state of Rio Grande do Norte, and taking in account

the *status quo* of its business, they are mostly small and medium-sized companies. It is not considered industrialization, therefore, the preparation in these pharmacies for direct sale to the consumer of magisterial medicines are on prescription. Despite the numerous advantages that the compounded drug offers in relation to the industrialized one, ranging from the posologic to the economic ease, there are many obstacles that hinder the growth of the sector. The biggest of these obstacles is the lack of credibility of the product handled by the alleged absence of a rigid quality control of raw materials and finished products, lack of control of the production process and its reproducibility (Bonfilio et al., 2010). Quality is the watchword and it is intrinsic to any product or service provision at present, and for the compounding pharmacy this is essential to its survival.

In view of quality management models, most notably TQM and Six Sigma, the need for cultural change and knowing that small and medium-sized enterprises are subject to exactly the same threats as any large organization, but generally do not have all the resources needed to deal with these obstacles, there are a number of activities to be undertaken to prepare small and medium-sized enterprises (SMEs) for the implementation of the quality program.

The present work aims to identify and describe the importance of the organizational culture as a factor of influence in the processes of implementation of these programs in the reality of the pharmacies of manipulation of Rio Grande do Norte. Understanding the advantages of each type of culture should help managers to effectively achieve the implementation of quality practices from a holistic view of quality and culture management. The intention of the article is to serve as a guide, indicating the path for SMEs that do not yet work, but which intend to implement quality models, particularly TQM and Six Sigma.

2. LITERATURE REVIEW

2.1 Quality Practices TQM and Six Sigma

Quality management models have evolved and spread throughout the last century. The field was consolidated in the United States in the mid-1940s, with the emergence of the first association of quality professionals - the Society of Quality Engineers in 1945 and, later, the American Society for Quality Control (ASQC) in 1946, nowadays called American Society for Quality (ASQ). Shortly afterwards, in 1950, a Japanese association of scientists and engineers, Japan Union of Scientists and Engineers (JUSE), with an important role in the area of quality (CARVALHO and PALADINI, 2005) was also created.

A quality management program can be characterized by its principles, practices and techniques. The principles represent how the program should be implemented, through practices that, in turn, are supported by a series of techniques. When empirically evaluating the implementation of a quality program in an organization, quality practices must be examined in advance, as they represent the components which the organization works for continuous improvement. In comparison, the principles are too generic for an empirical study and the techniques too detailed, in other words, a quality program can be implemented using several techniques (Zu; Frenedall; Robins, 2006). Although some quality practices are found in other programs, in this work two models were analyzed: TQM and Six Sigma.

Among the models most adopted worldwide, the TQM stands out. Its origin was in Japan at the end of the Second World War, arising from the high Japanese competition at the time, pursuing high standards of quality and productivity at a moderate cost. TQM uses practices and techniques such as the reduction of rework, a new planning of the organizational processes, the benchmarking, the continuous analysis of the results and a relation of proximity with suppliers. TQM is an approach that aims at constantly improving organizational competitiveness, effectiveness and flexibility. It is composed primarily of planning, organizing and understanding each activity to be performed, it is dependent on each employee at every organizational level of the company, and

preaches respect and the human life importance in all departments of the company (Beheshti, Lollar, 2003).

There are several models of TQM available in the literature, however, since its inception in the 1990s, some constructs can be identified in the various approaches, which are: focus on the customer; leadership and commitment of senior management; involvement and participation of the workforce; relationship with suppliers and partners; management by procedures, management by guidelines; continuous improvement of procedures, products and services; and analysis of facts and data regarding quality (PINTO, CARVALHO and LEE, 2006). One of the definitions of the TQM philosophy is that it is an organizational culture distinguished by customer satisfaction, through continuous improvement in which all employees of the organization participate. Thus TQM, besides being a managerial philosophy, it also consists of an organizational culture and leads to its development (HELLSTEN; KLEFSJÖ, 2000).

Sreedharan and Sunder (2018) punctuated that late 1980s, Motorola introduced a quality management program called Six Sigma, which is widely used today. There are several definitions of Six Sigma in the literature. For Pande, Neuman and Cavanagh (2001), Six Sigma is a comprehensive and flexible working system, focusing on customer needs and exploiting knowledge of internal and external people in the company to use statistical tools and quality in performance measurement processes seeking to continuously improve them.

It can also be defined as a work philosophy to achieve, maximize and maintain success, understanding the needs of all involved, through a structured methodology, considering all aspects of the business. What sets it apart is the program structure, the search for a strong impact on financial results and focus on reducing variability, since the tools are the same used by known quality programs (ROTONDARO, 2002).

It is worth noting that Six Sigma may have different connotations, depending on the scope of the organization in which it applies. According to Watson (2000), the Six Sigma program can be classified as a metric, a methodology, a management and operational philosophy, and an organizational culture, an aspect explored in this research, since it stimulates participation and teamwork in the search for causes of process variability, as well as the excellence of meeting the demands and expectations of customers and shareholders (WERKEMA, 2002).

Through the analysis of the two models studied, it can be seen that the Six Sigma program and the TQM have several aspects in common. Thus, many of the statistical techniques and concepts defined in TQM are widely used in the Six Sigma model (PINTO, CARVALHO and LEE, 2009; REBELATO; RODRIGUEZ, 2010). Both initiatives share continuous improvement. However, the focus of each initiative is different: TQM has a more internal focus on management commitment, cultural change and employee training and education, and externally on meeting customer requirements. Six Sigma focuses on reducing organizational process variations, encouraging adjustments in these if the results are not satisfactory (REBELATO; OLIVEIRA, 2006; SREEDHARAN, SUNDER, 2018).

Table 1 - Key Quality Practices TQM / Six Sigma

QUALITY PRACTICE	DESCRIPTION
Involvement and Commitment of Senior Management	TO ensure that the quality program is linked to the company's strategies, allocate the necessary resources, support training, motivate and manage leaders, develop vision, diagnose and eliminate resistance.
Human Resources Management	The human resources sector must be prepared to select and train people to be collaborative, proactive. Communication becomes essential in creating the basis for model implementation in order to reduce doubts about the new approach and motivate employees to embark on the program.
Training	A crucial element in communication for employees and is probably the most common way of working the learning process and spreading new skills.
Focus on the client	To define in a clear way what the customer wants, that is, to define what are the critical characteristics for quality (CTQ's). With this information, performance standards can be defined so that the capacity of the processes can be measured accurately and, consequently, customer satisfaction can be predicted.
Project Selection	Correct selection and prioritization of the initial projects is an essential factor in the implementation of a quality program, and it is necessary to align these characteristics of the projects with the business objectives of the organization.
Use of Data, Tools and Techniques	It favors the decision-making process based on data and facts, and to do it, it is required the use of tools and techniques combined with a structured and disciplined method, to analyze and process this set of information in order to perfect the organizational processes.
Relationship with Suppliers	The success of a chain depends on all the links that make it up. If the commitment to the success of the quality model is also adopted by the suppliers, the chances of variation on the part of the products supplied become less of a concern on the part of the company, and this makes those improvement efforts able to be driven towards other troublesome areas.
Cultural change	The systems and structure of the company (hiring, training, recognition and reward processes) should be gradually modified to reflect and encourage the new culture of quality.

Source: Authors

Despite some comparative studies already carried out between the two models, there is still no consensus on their convergence. For Dahlgard and Dahlgard-Park (2006), it was compared objectives, approaches, tools, history and critical factors, concluding that Six Sigma shares TQM approaches. In the literature, several surveys were carried out in order to describe the issues that most affect the implementation of a quality management program. Antony and Bañuelas (2002) developed a research to determine the key ingredients for an effective implementation of the Six Sigma program in the UK industry.

2.2 Organizational culture

As previously explained, the adoption of a new management model in an organization generates transformations in structural, procedural, behavioral dimensions and organizational performance. Therefore, it is not possible to speak of new management models without mentioning the concept of organizational culture, which is now considered one of the main determinants of corporate success.

Hofstede et al. (1990) treats culture as a collective programming of the mind, which distinguishes the members of one human group from those of another group. He makes a comparison, stating that culture represents to the community what the personality represents for the

individual. For the author, culture determines the identity of a human group in the same way that the personality determines the identity of an individual. Santos (2000) defines culture as the values and beliefs shared by the members of an organization, which functions as an organizational control mechanism, informally approving or prohibiting behaviors and giving meaning, direction and mobilization to the members of the organization.

The controversy over the conceptualization of organizational culture expands to the definition of the methodology that best approaches to this subject. There are several approaches, including two main ones: qualitative and quantitative. Cameron and Quinn (2006) developed the Competitive Values Model for organizational culture assessment, in which they distinguish four types of culture.

The model addresses two main dimensions, shown in Figure 1. One is based on the organizational structure, with the possibility of emphasis on flexibility and dynamism or stability, order and control. The other dimension is related to the organizational approach, differentiating the emphasis on orientation to the internal environment or the external environment.

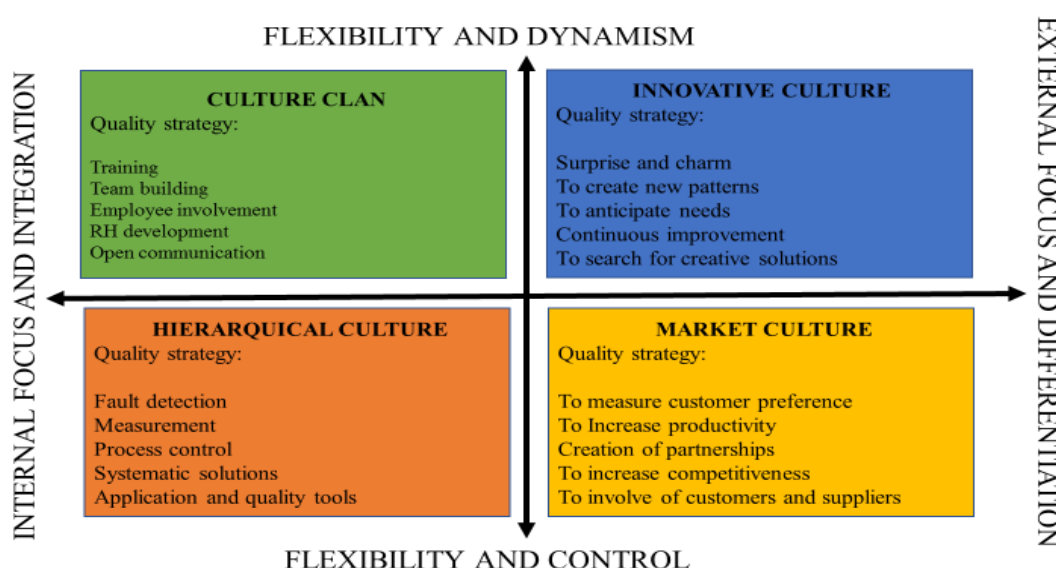


Figure 1 - The Values that Compete in Total Quality Management

Source: Based on Cameron e Quinn (2006)

These two dimensions give rise to four quadrants, which represent distinct cultural elements, according to the main characteristics and values assumed. Each quadrant symbolizes a type of culture, characterizing the Typology of Cameron and Quinn. The union of the four types represents the cultural profile of the organization. The quadrants were given names consistent with their specificities: Clan, Hierarchical, Innovative and Market. The name of each quadrant represents the main characteristics of the values they assume, in other words, the common cultural traits as well as the competition between the values that characterize human behavior.

The Clan Culture is characterized by a friendly workplace where people share personal and professional experiences. The organization is seen as an extension of the family and remains integrated in the base of loyalty and tradition. Hierarchical Culture has as its main aspect a formal and structured workplace, with rules and policies that emphasize stability, efficiency and predictability (CAMERON; QUINN, 2006).

The values of the Innovative Culture direct to changes and new challenges, believing that success is in the production of unique and original products and services. Leadership is visionary and risk-oriented. In Market Culture, the management's objective is to guide the organization towards productivity, results and income (CAMERON; QUINN, 2006).

3. MATERIAL AND METHODS

According to Gil (1999), this study is classified as exploratory-descriptive, using initially the qualitative approach, and then using the quantitative approach. Exploratory research is typically the first approach of a theme, broadening the view of the current problem and pointing out other avenues for future research (LAKATOS; MARCONI, 1992). The author also says that this kind of research is carried out especially when the chosen theme is little explored, which is the truth when it comes to the implementation of a quality model and its relationship with organizational culture, especially when it is about SMEs (WESSEL; BURCHER, 2004).

It is important to emphasize that although some of these practices are also related to other quality programs, which have been the focus of extensive work, this article presents a more specific view within the TQM / Six Sigma quality practices (REBELATO; RODRIGUES, 2010). In the next phase, a descriptive research was carried out, whose aim is to obtain a description of the cultural profiles, adoption of quality practices and characteristics of the SMEs under study. The descriptive research that will be adopted is the survey.

Finally, it has a correlational character, since it seeks to identify the existing relationships of the elements of the cultural profile of the SMEs, with the TQM / Six Sigma quality practices, which are considered critical factors for the success of the program. According to Sampieri et al. (1991), the correlational study aims to measure the degree of relationship between two or more concepts or variables.

3.1 Data collection

The research was carried out in compounding pharmacies in Rio Grande do Norte area from July to September 2013. For the purposes of this research, the population registered at Association of Pharmaceutical Magistrates (ANFARMAG, 2007) was considered, corresponding to a total of 45 (forty-five) pharmacies (legal entities) in the state. Although some pharmacies have branches, which would raise this number, they will be considered only as one. This is due to the size of these companies, leading them to believe that although they have more than one subsidiary, management and consequently their cultural profile is the same.

Taking into consideration that the leaders (managers) are seen as a major contributor to the prevailing culture in the company, we can say that their answers may approach to the reality of the organization under study. The questionnaires were delivered personally to the pharmacy managers along with a cover letter for further clarification on the purpose of the research. While recognizing that the complexity of an organization is not limited to its managers, this measure was taken to operationalize the research.

A total of 40 questionnaires were answered, out of forty-five delivered. In these cases, the reasons given were the unavailability of time and lack of interest. The initial intention was to carry out a census survey with full coverage. As five questionnaires were not answered, the type of data collection is characterized as a census study with a response rate of 89%. It should be emphasized that the questionnaire presents an explanatory letter, with the objectives of the research and the guarantee of confidentiality of the company's names.

Subsequently, a questionnaire was prepared, presented as an attachment, divided in three parts: company profile; respondents' perspectives related to the degree of adhesion to TQM / Six Sigma quality practices, in which each item is answered on a Likert scale (GIL, 1999) with five response options: from 1 = never used to 5 = widely used; and organizational culture profile elements, through the Organizational Culture Assessment Instrument (OCAI) that operationalize the Competitive Values Model (Cameron and Quinn, 2006; Santos, 2000). This model maps the organizational culture into four profiles: Clan, Innovative, Market and Hierarchical.

Through its indicators, the OCAI with minor adjustments for the companies under study, captures data referring to the elements of the cultural profile of the organization, namely: 1) dominant characteristics; 2) organizational leadership; 3) people management; 4) organizational union; 5) strategic emphasis; and 6) success criteria. Each indicator has four statements and each represents a specific element of the cultural profile: A = Clan; B = Innovative; C = Market; and D = Hierarchical.

3.2 Data Analysis

The analysis and treatment of the data resulting from this survey used the following procedure: after the return of the questionnaires, they were organized with the aid of suitable computational applications. The data were registered into the Statistical Package for the Social Sciences (SPSS), version 12, and into statistical based software R, aiming to establish descriptive statistics of the sample. The tab was made in Windows® Excel spreadsheet application followed by the same sequence of groups and blocks contained in the questionnaire, as recommended by Malhotra (2001). The data were calculated and expressed in percentages and averages and, with the tabulations, it was designed graphs that served for the later analysis of the results obtained based on the literature.

4. RESULTS

4.1 Characterization of the researched companies

In order to contribute to the interpretation of the results, the pharmacies were classified according to their size, being used as parameter the number of employees. This is because of the difficulty in obtaining other data, such as billing information.

According to the survey, a total of 80% of pharmacies have up to 49 employees, while only 15% have more than 100. This finding shows that compounding pharmacies play an important role in microeconomies, creating jobs and increasing the economy where they are located. The literature highlights the predominance of large companies applying Six Sigma, which companies of all sizes can implement, but as the results are generally proportional to the size of the company, a smaller project can be very significant in a minor company and can ensure greater competitiveness.

4.2 Description of the organizational culture profiles

It was used the competitive values model developed by Cameron and Quinn, as explained previously in the description of the methodology of this work. The values acquired were determined by adding up all the points that the items associated with each culture received, and then divided by six (number of items included in the instrument). Once these current profiles were calculated for the individual pharmacies, the overall profile of the Compounding pharmacies determined by the average value of the pharmacies was determined.

Table 1 - Average value and standard deviation of elements from organizational culture Current and Ideal Profile

Culture	today		Ideal	
	average	Standard deviation	average	Standard deviation
Clan	2,7	1,05	3,1	1,03
innovative	2,5	1,02	2,9	0,91
Market	2,3	1,13	2,0	0,91
Hierarchical	2,1	1,17	2,1	1,12

Source: Field Research

As can be observed, average values suggest that the organizational culture of pharmacies is characterized by the clan culture (2,7) and by the innovative culture (2,5), with a less proportional representation of the elements of market cultures (2,3) and Hierarchical (2,1). Today, there is a certain balance between the four cultural elements, however with a greater tendency for the Clan and Innovative cultures.

The numbers illustrate that the researched organizations present as central values of their organizational culture those corresponding to the Clan Culture, which is characterized mainly by a friendly workplace and by participation. The other set of values that also has considerable weight to shape the culture of pharmacies is that of Innovative Culture, which is characterized by a dynamic working environment, geared towards changes and new challenges. In general, this means that pharmacies are governed by flexibility and dynamism, especially in the internal environment (Clan), also in the external environment (Innovative), as specified in the typology of Cameron and Quinn (2006).

The cultural profiles, considered ideal by the respondents, were treated in a similar way to the current profile, that is, by calculating the ideal profile for each pharmacy and then the overall profile. The differences between current profiles and ideas represent the desired changes in organizational culture by managers. The overall profile of what would be ideal for managers of compounding pharmacies shows a desire to increase the features of Clan culture (3.1) and Innovative culture (2.9) and a decrease in the market culture element (2.0). Thus, there remains a perception that emphasizing the vision of the organization as an extension of the family (clan) and highlighting the flexibility and external differentiation (Innovative) are the best ways for the organization. As for Hierarchical culture (2.1), it still is an unexpressive cultural element, both in the current profile as the ideal profile.

For a more detailed analysis, pharmacies were divided into groups, considering the characteristics of the current cultural profile and the similarity between them. The most commonly used technique for this purpose was the cluster analysis (EVERITT, 2005)

The first group (yellow) called "stable with exterior focus" is represented by organizations that have a current cultural profile with degrees of emphasis that are fairly balanced in the four elements of the cultural profile. Even so, it is possible to notice a slight predominance of the Market element, which means that this group will present stability and control, mainly in the external environment.

The second group (blue) called "flexible with exterior focus" represents a positive combination of the elements Innovative and Clan. Thus, the companies in this group are characterized by flexibility and dynamism, mainly in the external environment (Innovative) and still in the internal environment (Clan). In this case, values such as loyalty, involvement and commitment of the employees are present, despite the increased emphasis on innovation and the search for creative solutions.

The third group (green) called "flexible with internal focus" as well as the previous one, is also strongly characterized by flexibility, with a strong presence of Clan and Innovative elements. However, in this case, there is a greater focus on internal environment and integration (Clan) at the expense of focus on the external environment and differentiation (Innovative).

Two other groups highlighted in Figure 2 were isolated from the others. This is because the questionnaires presented incomplete or incorrect answers, failing to meet the proposed objective, making it unfeasible to produce a real evaluation of the different degrees of emphasis in the four elements of the organizational culture profile.

From this analysis it is evident that, despite the strong presence of the Clan and Innovative elements and the low values attributed to the Market and Hierarchical elements in the global group, there are certain peculiarities that must be taken into account. Thus, we conclude that no group will have characteristics of a single culture, but most have a combination that predominates. And it is

from this combination that one can make use of the strengths of each cultural profile so that later Six Sigma quality strategies are adopted.

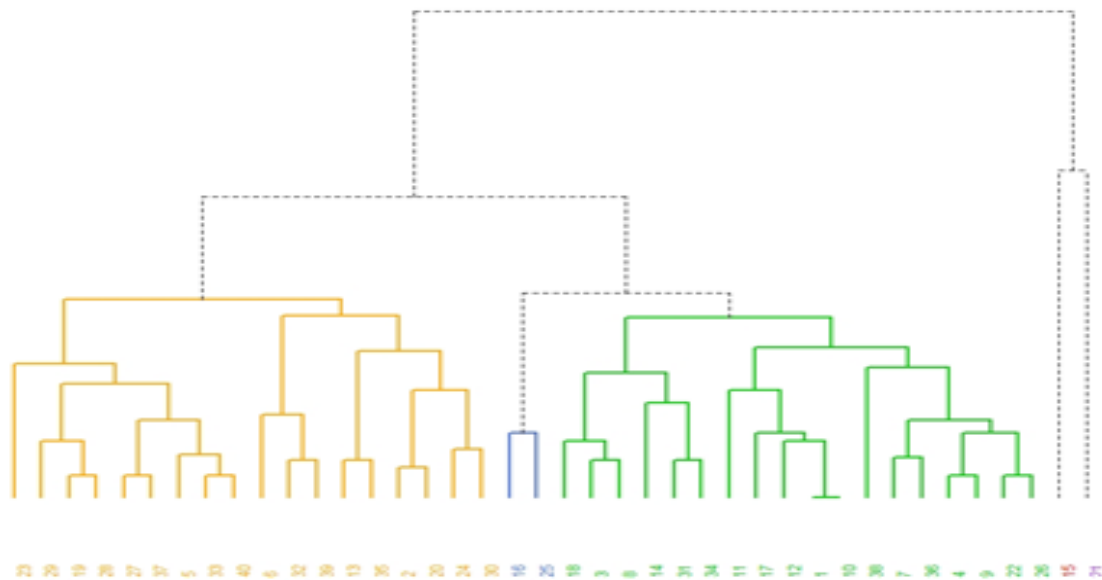


Figure 2 - Cluster Groups (Current Cultural Profile)

Source: Field Research

4.3 Relationship between organizational culture and TQM / Six Sigma quality practices

The empirical results of this study reveal that the different types of culture influence differently the quality practices. This finding confirms the importance of the cultural group in quality management, as suggested in primary studies (NAOR et al., 2008, PRAJOGO, MCDERMOTT, 2005). In order to respond to the objective that deals with the relation of the element of the current and ideal cultural profile with the adoption of TQM / Six Sigma quality practices, the author sought to discover the level of use of quality practices, indicated in Table 2.

The three most used TQM / Six Sigma quality practices were: focus on customer satisfaction, support and commitment from top management as well as open and constant communication in the entire process, all of these have a level of utilization that varies from fairly to widely used. Thus, it can be stated that the compounding pharmacies have features related to the quality model TQM and Six Sigma, mainly in what concerns the human resources management and focus on the customer.

On the other hand, only one practice, characterized by the use of statistical tools, is between level 1 (little) and 2 (reasonably used). Being this one of the foundations for the success of the quality program, it can be said that there is a great challenge to demystify not only the managers, but also all other members of the organization about the use of statistical tools, emphasizing the importance of statistical thinking in quality management (DAHLGAARD; DAHLGAARD-PARK, 2006; ZU, FRENDEDALL, ROBBINS, 2010; REQUEIJO, 2018). The other TQM / Six Sigma quality practices were between the third and fourth level of the Likert scale, that is, from reasonably used.

Overall, the TQM / Six Sigma quality indicators of pharmacies received an average above 3.00, which is equivalent to a positive perception about quality at a medium level. Thus, it is observed that RN compounding pharmacies have a good use of index of TQM / Six Sigma quality practices, but still have considerable room for improvement in this index.

Table 2 - Levels of use of TQM / Six Sigma Quality Practices

Quality practice	Average	Standard deviation
Focus on customer satisfaction	4,45	0,78
Support, involvement and commitment of senior management	4,33	0,88
Open, constant and honest communication of the whole process and results	4,08	1,07
awareness of what the customer wants	3,93	0,92
Decision-making process based on data and facts	3,88	1,09
Training program that encourages the learning and dissemination of new skills	3,83	1,05
When identifying improvement projects, direct financial gain is the most widely used indicator	3,53	1,01
Program for acknowledgement, reward and appreciation of employees	3,43	1,10
Strategic relationship with suppliers	3,40	1,03
Structured method for analysis of information based on statistical tools	2,93	1,18

Source: Field Research

Although the evaluation of the level of use of TQM / Six Sigma quality practices has been positive, it is important to emphasize that organizations should make improvements in all of them to become excellent pharmacies, paying special attention to the use of statistical tools. Another interesting fact that can be deduced is that despite the high level of focus on customer satisfaction, there is a certain difficulty on the part of companies to know what the customer really wants, that is, what is critical for him (KAYNAK, 2003; DOUGLAS, 2017). This may also be linked to the fact that the low use of statistical tools does not provide enough information for further analysis.

Similarly, to what was done in the analysis of the current cultural profile, the compounding pharmacies were divided into three distinct subgroups according to the level of use of TQM / Six Sigma quality practices, as shown in Figure 3. These were highlighted with different colors in order to trace their common characteristics, based on the similarity between them.

In the first group (yellow) called "low level of use of TQM / Six Sigma practices", we can highlight the low adherence to all TQM / Six Sigma quality practices, varying between rarely to never used. Only the financial gain stood out positively as the most commonly used parameter in identifying improvement projects, not interfering positively in others.

In the second group (blue) referred to as "high adherence to TQM / Six Sigma practices with strong HR management", a certain inversion of values can be evidenced, with a level of utilization varying between fairly to very used to most quality practices, with only nine and ten practices being conceptualized with lower values, that is, a structured method for analyzing information based on statistical tools and financial gain as the most used parameter in the identification of improvement projects.

The third group (purple) called "high adherence to TQM / Six Sigma practices with focus on the customer " refers to the larger number of pharmacies, showing a high-level use of practices involving support, management participation, focus on the customer, open and honest communication of the whole process. However, the group showed a low level of use of the practices involving: a reward system and employee appreciation, a training program that stimulates learning, a strategic relationship with suppliers and a structured method for analysis of information based on statistical tools.

The use of clustering technique brings a great differential in the process of implementing the quality model in organizations. This is because it will allow differentiated strategies for each subgroup to be adopted, given their specific characteristics. In other words, knowing the quality practices with lower levels of activity one can work for further development of these factors at the expense of others that are already in an advanced stage.

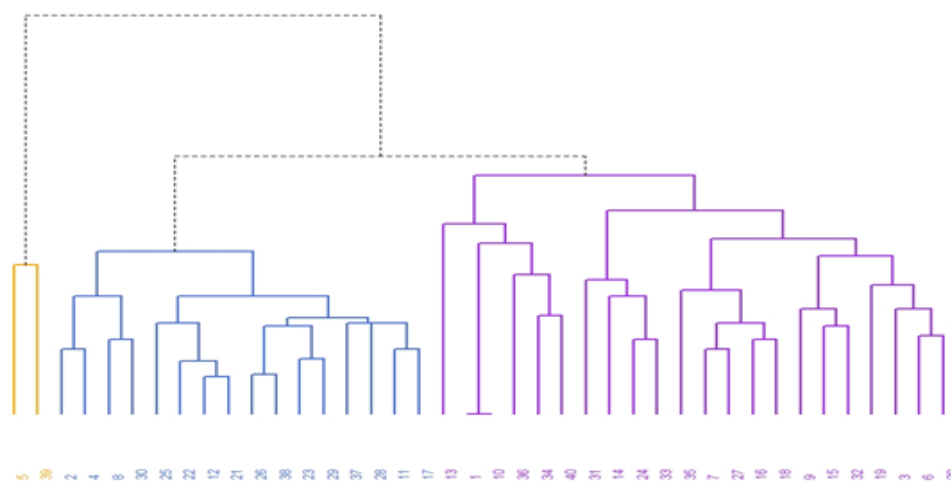


Figure 3 - Cluster Groups (TQM / Six Sigma Quality Practices)

Source: Field Research

In order to reach the relationships between current and ideal cultural profile and TQM / Six Sigma quality practices, the Spearman correlation analysis technique was used with the quantitative data of the study. The coefficients between the culture profiles and the TQM / Six Sigma quality practice indicators are presented in Table 3.

Within this relationship, the elements with the largest number of current practices were Clan and Hierarchical, followed by the elements of Market and Innovative. Due to the high frequency of significant correlation, for $\alpha = 5\%$, it was pointed out that there is a relationship between culture and TQM Six Sigma quality practices. Although considered liberal, the significance level of 0.10 has been adopted in some cases in order to leave noticeable results that may prevent rejection of possible relationships.

It's worth noting that even the test providing statistically significant correlations, they are not very strong, all below 0.44 in absolute terms. Yet it is important to note that these correlations will serve as indicative for the existing relationships between organizational culture and Six Sigma, suggesting further studies as well as a more detailed analysis.

The Clan element of the current cultural profile has the highest number of positive relations with the practices: support and commitment of top management, focus on customer satisfaction, reward system and employee appreciation, open and honest communication of results and process decisions based on data and facts. There was no negative relationship with any indicator, showing that the greater the representation of this cultural profile element, the greater the use of the above practices. Other five practices did not present significant relationships

Effective implementation of quality practices requires an organizational environment that encourages open communication and employee involvement to facilitate change and provide the resources needed for continuous improvement. Through the development of a group culture, organizations promote participation, trust, and a concern for human development as a core value. In this supportive environment, employees are not only encouraged to participate in continuous improvement teams but are also rewarded for their contribution to a improve quality; They also receive the training and education to be successful in their work (BEER, 2003; BHOTE, 2003; BREYFOGLE *et al.*, 2001; FLYNN, SCHROEDER, SAKAKIBARA, 1995; KAYNAK, 2003; REQUEIJO, 2018).

Table 3 - Correlation between Organizational Culture and TQM / Six Sigma Quality Practices - Real Profile

Indicator	Clan	Innovative	Marketplace	Hierarchical
Support, participation and commitment of senior management	0,321 p=0,049	0,364 p=0,027	-0344 p=0,034	-0,334 p=0,043
Focus on customer satisfaction	0,402 p=0,0110	0,424 p=0,008	-0,437 p=0,005	-0,397 p=0,013
Knowledge of what the customer wants		0,322 P=0,047		
Program for acknowledgment, rewarding and appreciation of employees	0,325 p=0,013			
Open, constant and honest communication of the whole process and results between the collaborators	0,334 p=0,037		-0,389 p=0,014	-0284 *p=0,083
Training program that encourages the learning and dissemination of new skills				-0,406 p=0,011
Decision-making process based on data and facts	0,419 p=0,008	0,310 p=0,050	-0417 p=0,008	-0,343 p=0,035

Correlation is significant at the 0.05 level / * Correlation is significant at the 0.10 level

Source: Field Research

The Hierarchical element is negatively related to five indicators. Thus, the greater its representativeness, the lower is the use of practices aimed at supporting top management, focus on customer satisfaction, open and honest communication of the whole process, program and training that stimulates learning and decision-making process in facts and figures. The hierarchical culture has no significant links to management or process or structured improvement procedures such as TQM and Six Sigma. The lack of significance of hierarchical culture for organizational effectiveness has been observed in previous studies (CAMERON, FREEMAN, 1991; YEUNG, BROCKBANK, ULRICH, 1991; ZU, FRENDEDALL, ROBBINS, 2010).

The innovative element has no negative relation with any indicator. The results show that the Innovative Culture is significantly related to the implementation of the documented structure for quality management. Valued individuality within this culture supports the Six Sigma approach, which provides training based on need and differentiation by task, as well as it assigns different roles and responsibilities to Six Sigma experts based on their knowledge. As innovative culture exemplifies tolerance towards flexibility, the trend to transfer power to the workforce, according to the problem being addressed at the time proves to be easier to organize task-based quality teams (LINDERMAN, SCHROEDER, CHOO, 2006; CAMERON; QUINN, 1999; SCHROEDER et al., 2008).

The Market element presents a negative relation with these same indicators, besides the open and honest communication in the whole process and the results. Market culture has a significant effect on quality practices, this culture emphasizes productivity and achievement, with clearly defined objectives for external competitiveness, which is consistent with quality management practices. The efficiency and profit orientation are favorable to quality practices such as Total Quality Management that focuses on achieving superior quality and competitiveness (DEAN; BOWEN, 1994).

Only three indicators showed no relationship, positive or negative, with the elements of culture: strategic relationship with suppliers, structured method for analysis of information and identification of improvement projects using direct financial gain as a parameter.

In general, it was noticed that the Clan element is most positively related to TQM / Six Sigma quality practices, while the Hierarchical element is more negatively related to practices. Clan Culture, according to Cameron and Quinn (2006), adopts as a quality strategy the development of Human Resources, highlighting values such as loyalty, tradition, morality and commitment, which are fundamental for the development of relationships of trust. These relations usually exist in the

internal environment of organizations where the cultural type predominates, in which there is a feeling of friendship and integration among the organizational members. Thus, pharmacies that have higher values of the Clan element tend to have among other characteristics a method to reward their employees, an open communication in the whole process and a greater commitment from the top management.

The Innovative culture values the originality of its products and services and emphasizes creativity, differentiation and innovation. Therefore, it is likely that the pharmacies in which there is a predominance of this type of culture are more attentive to “the new great thing” in the market, organizing their physical elements in an attractive and creative way from a process of decisions based on data and facts with the support of the top management and always with the purpose of satisfying the client. In this case, the main strategy of quality is the surprise and charm of the customers through creative solutions (CAMERON; QUINN, 2006).

On the other hand, the Market Culture is characterized by aggression, ambition and focus on productivity and competitiveness. According to Cameron and Quinn (2006), the organizations that evidence this behavior believe that the external environment is not benign and often establish relationships of hostility with their clients, positioning organizational interests on results. Therefore, it can be inferred that in pharmacies where Market Culture prevails there is a tendency to obtain lower levels of quality in some Six Sigma practices, especially in the focus on the customer aspect.

Also contrary to the Clan and Innovative culture, the Hierarchical Culture is centered on internal control, stability and predictability. The very nature of internal control directs organizations to focus on compliance and it can leave the expectations and needs of external clients behind and consequently limit employee participation and involvement.

Considering the elements of the ideal culture profile, there is a change in the correlations between the culture elements and the TQM / Six Sigma quality practices, as there is a reduction in the number of practices that present significant correlations. The values previously targeted to the Hierarchical and Market elements were migrated to the Innovative and Clan elements that continued to present the highest number of positive correlations with TQM / Six Sigma quality practices.

Even with the test providing significant statistics for $\alpha = 5\%$, correlations remained below 0.47. However, it is important to highlight these correlations, which in turn will suggest existing relationships between organizational culture, ideal profile, and Six Sigma, providing new analyzes regarding the influence of culture on program implementation. The level of significance of 0.10 although considered liberal, was also adopted for this analysis, as previously explained.

Table 4 shows the relationship between organizational culture in the ideal profile. The element with the highest number of current practices was the Clan element, followed by the Innovative and Hierarchical elements. The Market element, in the ideal profile, did not present a significant negative correlation.

The Clan element is more related to practices in the ideal profile, in a positive way. The Innovative element is positively related to the open and constant communication indicator of the whole process; and negatively with a structured method based on statistical tools. The market element that uses as a quality strategy the creation of partnerships and the involvement of suppliers (CAMERON; QUINN, 2006) is positively related to the strategic relationship with suppliers. The Hierarchical element is more negatively related with the open and constant communication indicator of the whole process; and in a positive way with a structured method based on statistical tools. This positive relationship can be explained by the characteristics of this cultural profile used in quality management, among which are: measurement, process control, application and quality tools (CAMERON; QUINN, 2006).

In general, the relationship between the TQM / Six Sigma quality practices and the ideal cultural profile shows the following relationships; The more pharmacies use TQM / Six Sigma

quality practices, the more managers idealize a culture in the Clan element and less in the Hierarchical element. The opposite is also true.

The results show the existence of relations between current and ideal cultural profiles and the TQM / Six Sigma quality practices. Although the correlation coefficients do not present strong relationships, their significance confirms this existence. Both in the current and ideal cultural profile, quality practices present more positive relations with the Clan and Innovative cultural elements. Analyzing this relationship and knowing that these elements are the ones that best represent the compounding pharmacies according to item 4.2, we can infer that the organizations under study already present a more fertile ground, that is, a facilitating structure for the implementation of the quality management program.

Table 4 - Correlation between Organizational Culture and TQM / Six Sigma Quality Practices - Ideal Profile

Indicator	Clan	Innovative	Marketplace	Hierarchical
Support, participation and commitment of senior management	0,359 p=0,045			
Focus on customer satisfaction	0,236 p=0,050	0,279 p=0,001		
open, constant and honest communication throughout the process and results among employees	0,427 p=0,022	0,464 p=0,004		-0,411 p=0,012
Training program that encourages the learning and dissemination of new skills				
Decision-making process based on data and facts	0,319 *p=0,087			
Strategic relationship with suppliers			0,298 P=0,020	
Structured method for analysis of information based on statistical tools		-0,438 p=0,007		0,346 p=0,036
Identifying improvement projects, direct financial gain is the most commonly used parameter				

Correlation is significant at the 0.05 level / * Correlation is significant for the level of 0.10
Source: Field Research

To identify the combination of cultural groups from compounding pharmacies, current profile, with groups that make use of quality practices TQM / Six Sigma, both obtained by cluster analysis, it felt necessary to use techniques from correspondence analysis (Everitt, 2005), as shown in Figure 4.

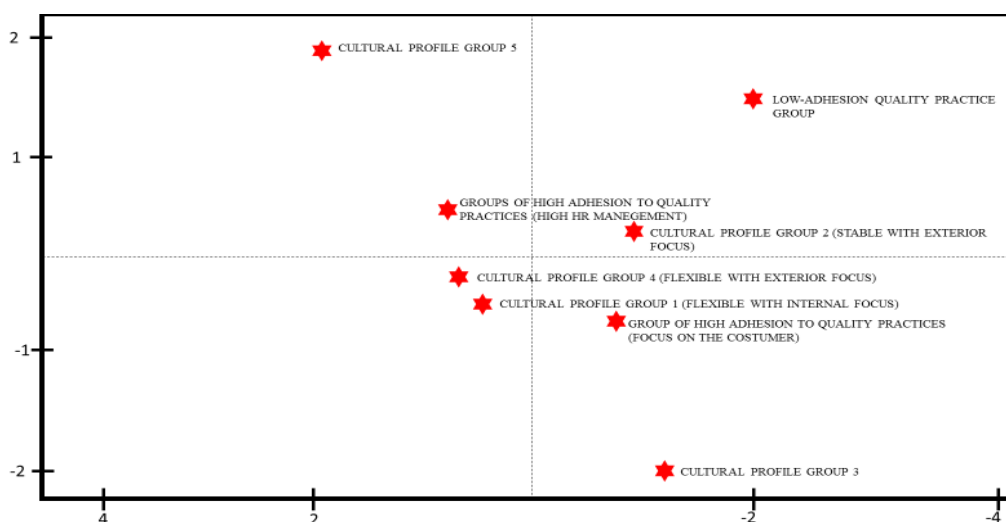


Figure 4 - Groups (Cultural Profiles) × Groups (TQM / Six Sigma Quality Practices)

Source: Field Research

5. CONCLUSION

The idea of working on concepts of quality management models, specifically TQM and Six Sigma, and organizational culture emerged from studies that pointed to the human element as an increasingly determinant factor in the successful implementation of the program. In addition, the absence of specific literature dealing with the topic has triggered the need to produce more material in the area.

For this reason, it is assumed that the study is justified, as it increases the number of theoretical and practical information about the subject, contributing to the dissemination of the latest techniques and technologies in the area of quality and serving as a guide for companies that are not yet working, but intending to work with TQM and / or Six Sigma.

Field research has provided us with a clear view that there is a tendency for leaders to be extremely committed, supportive and to value human resource development. It was also detected that there is a strong tendency from compounding pharmacies to continue working with a Clan culture mindset, which emphasizes teamwork and the innovative culture, tend to be dynamic, enterprising and creative. From the result of the existing correlations, it can be inferred that a positive combination of Clan and Innovative and negative Cultures of Market and Hierarchical Cultures will form a cultural profile with greater possibilities to reach higher levels of TQM / Six Sigma quality.

In view of the progress in the discussed topic, the limitations and their suggestions were highlighted with that intention. The number of pharmacies was limited to one pharmacy from each network. In addition to that, compounding pharmacies do not represent all the small and medium-sized businesses. Are suggested to increase the number of companies studied as well as the number of segments these companies would be related to.

Another limitation was the triangulation of information: Only one individual from each company has been consulted, this can generate a natural bias of an individual over the whole. To resolve possible distorted views and determine the different perceptions, are suggested increasing the number of respondents per company.

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All authors stated that they had: a) actively participated in the discussion of the results; and b) Review and approval of the final version of the paper.

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