

## Article

# Evaluating the impact of accreditation on Brazilian healthcare organizations: A quantitative study

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## Abstract

**Objective:** The aim of this study was to evaluate the impact of accreditation programs on Brazilian healthcare organizations.

**Design:** A web-based questionnaire survey was undertaken between February and May 2016.

**Setting:** Healthcare organizations from the Federal District and from 18 Brazilian states.

**Participants:** The quality managers of 141 Brazilian healthcare organizations were the main respondents of the study.

**Intervention:** The questionnaire was applied to not accredited and accredited organizations.

**Main Outcome Measures:** The main outcome measures were patient safety activities, quality management activities, planning activities—policies and strategies, patient involvement, involvement of professionals in the quality programs, monitoring of patient safety goals, organizational impact and financial impacts.

**Results:** The study identified 13 organizational impacts of accreditation. There was evidence of a significant and moderate correlation between the status of accreditation and patient safety activities, quality management activities, planning activities—policies and strategies, and involvement of professionals in the quality programs. The correlation between accreditation status and patient involvement was significant but weak, suggesting that this issue should be treated with a specific policy. The impact of accreditation on the financial results was not confirmed as relevant; however, the need for investment in the planning stage was validated.

**Conclusions:** The impact of accreditation is mainly related to internal processes, culture, training, institutional image and competitive differentiation.

**Key words:** Quality improvement, certification/accreditation, patient safety, surveys

## Introduction

In Brazil, as in several other countries, the number of healthcare organizations seeking quality certification of their processes through

accreditation is increasing. The accreditation of healthcare organizations is an integral part of the healthcare quality system in >70 countries [1]. Currently, ~61 accrediting organizations are estimated

to exist globally [2]. International accreditation is increasing rapidly, and most accreditations are conducted by the Joint Commission International (JCI) [3] that is headquartered in the USA and is present in more than 60 countries. Research indicates that there is no one-size-fits-all approach for introducing the program in different regions of the world [4]. However, there are gaps in research when it comes to proving the benefits of accreditation [5–9].

Several factors have driven the healthcare sector to implement programs for improving the quality of healthcare services. These factors include healthcare costs, number of adverse events [10–12], complexity of new technologies, aging population, and rapid dissemination of transmissible diseases across the globe.

The impact of accreditation programs on healthcare organizations and service units were examined in several studies between 2012 and 2015 [13–27]. The impacts highlighted by these studies include continuous quality improvement, organizational culture of quality and safety, compliance with external program guidelines, standardization of care processes and establishment of performance management systems. In a survey conducted in Lebanon, most hospitals considered accreditation a worthy investment because of its effect on enhancing the quality and safety culture [26]. Another study considers accreditation as the first step toward achieving excellence in healthcare [27]. Concerning the financial dimension, accreditation could provide an opportunity for increasing funding [28] or reducing costs [22, 29, 30].

In summary, this research was first oriented toward studying the growing number of organizations in the healthcare sector seeking accreditation as a major quality improvement mechanism; second, existing studies fail to demonstrate the effectiveness of existing programs. Therefore, the objective of this research is to answer the following question: ‘What are the major impacts of accreditation on Brazilian healthcare organizations?’

## Method

### Context

According to the Brazilian national register, in April 2016, there were around 6660 hospitals and 283 thousand healthcare organizations. Approximately 0.2% healthcare organizations have at least one accreditation in Brazil. The proportion of accredited Brazilian hospitals is around 5%. In addition to the Brazilian National Accreditation Organization (ONA), there are three international accreditors operating in Brazil, namely JCI, Canadian Council on Healthcare Services Accreditation (CCHSA), and National Integrated Accreditation for Healthcare Organizations (NIAHO). Hospitals (327 out of 610) comprise a majority of the accredited organizations, with 250 out of the 327 having a national accreditation.

Additionally, in relation to service quality certification, there is the perspective that the public sector will adopt the payment of organizations according to their current situation, which should significantly increase the number of accredited organizations in the country. Currently, Brazilian hospitals are not required to undertake quality evaluation programs for their services.

### Conceptual model

Conceptual model development was facilitated by previous literature review [5–9], updated literature review, earlier empirical research [31, 32], international quality standards and expert opinion.

The model tested (Fig. 1) two output variables (organizational and financial impacts) and six input variables or independent

variables (patient safety activities, quality management, planning—policies and strategies, patient involvement, involvement of professionals and monitoring patient safety goals).

Based on the conceptual model, six research hypotheses related to the input variables were defined and described as, ‘there is no relationship between each input variable and the accreditation status.’ Additionally, the study evaluated whether ‘hospital accreditation has a positive organizational and financial impact on improving processes and outcomes.’

The decision to use input and output measures related to activities and quality issues, respectively, is justified based on the difficulty in obtaining valid measurements and accurate reports to assess service quality [33, 34].

### Research instrument

The questionnaire comprised the following parts: characterization of organizations, respondents’ profile and a specific part for each variable of the conceptual model.

The questionnaire contained two types of multiple-choice questions with three answer options. In the first question type, the possible answers were ‘Yes,’ ‘No’ and ‘No, not entirely operational.’ In the second question type, the possible answers were ‘Agree,’ ‘Disagree’ and ‘Neutral.’ Except for the section on characterization of the organizations and respondents, the SurveyMonkey® feature was applied for all other questions. This software permits question randomization, that is, the order of questions will be different for all the respondents, as it will be randomized by the system. The ‘mandatory response’ format was used for all the questions.

### Data collection

The sampling technique used for data collection was a convenience sample rather than a randomly chosen sample. Since a complete listing of organizations was not available, the participants were identified through the Internet, personal contacts, and local associations. Additionally, the researchers were supported by ONA; it invited participants from its database.

The respondents were invited by phone, email or the contact form in institutional websites. In most cases, quality management professionals were contacted after obtaining internal approval (senior management and local research ethics committee). Reminders were sent thrice within an interval of 15–20 days to those who had not responded to the questionnaire.

Completed questionnaires were submitted online using the SurveyMonkey® research software. The data were collected between February and May 2016. The respondents were allowed to choose only one answer and to take help from other members in their organization whenever it was deemed necessary.

### Statistical analyses

The variables were evaluated based on the total number of ‘Yes’ answers to test the hypotheses of the study, which implied that the activity is present and fully operationalized in the organization. The Spearman correlation and logistic regression analyses were performed.

The following Spearman’s Rho correlation coefficient was considered: <0.2, 0.2–0.39, 0.4–0.69, 0.7–0.89 and >0.9 as very low, low, moderate, high and very high ratios, respectively [35]. Additionally, the  $P < 0.05$  level was considered significant. The values of coefficient of determination were found to be weak,

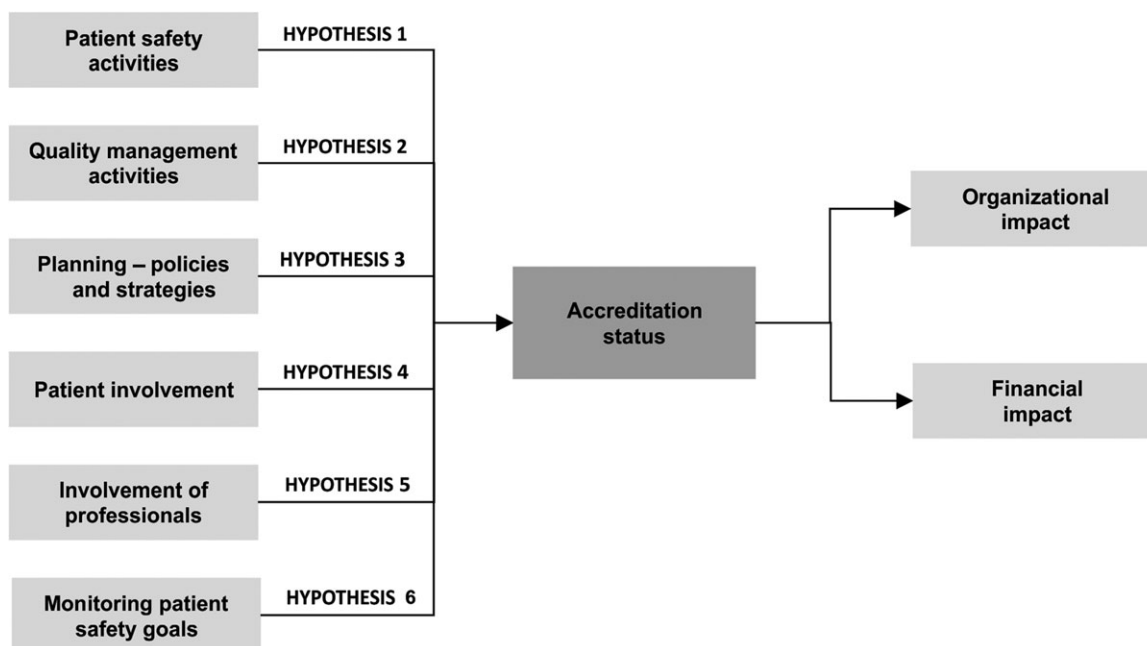


Figure 1 Conceptual model.

moderate and strong at 0.19, 0.33 and 0.67, respectively [36]. However, in the social sciences, 0.25 values can be considered useful [37].

All the statistical analyses were conducted using the statistical package for the social science (SPSS), version 17.0.2 (11 March 2009). Since SurveyMonkey® permits the respondent to move to the next screen of questions only if all the questions on the current screen have been responded to, concluding the questionnaire automatically indicated that all questions had been responded to. Hence, it was not necessary to define a treatment for the missing data.

Psychometric methods were applied to investigate the reliability (Cronbach's alpha > 0.70) and the convergent (item: factor-loading > 0.5, variable: AVE > 0.5) and discriminant validity of the instrument [37].

## Results

### Participants

Of the 161 complete questionnaires, only 141 were considered valid. The response rate was 17.67% (141 out of 798 approached organizations). The final sample comprised hospitals and healthcare organizations from the Federal District and from 18 Brazilian states. The background characteristics of the participating organizations are given in Table 1. These organizations were not accredited by the NIAHO program.

Most of the organizations (82.83%) reported that it took 3 years to prepare for the accreditation. The average time between starting preparations for accreditation to obtaining it was 1 year and 11 months.

### Respondents' profile

Characteristics of the respondents who filled in the questionnaire are given in Table 2. The average time that the respondents held their current position is 6.3 years (SD 5.96), and the average time they served in the organization is 9.6 years (SD 7.85). Concerning the professional experience, 75% of respondents have at least 10 years of experience.

### Descriptive analyses

The descriptive analysis of the independent variables with affirmative responses by health organization is available in Appendix 1. Table 3 shows the results for the six independent variables. Additionally, there were no statistically significant differences in response by organization type (hospital or others), ownership (private or not), and status of ISO 9001 certification (certified or uncertified). The following points can be highlighted from the results: the implementation of Lean tools, Six Sigma and 5S was found to be low and there is no evidence of a significant difference from their implementation according to the accreditation status; the high number of questions with evidence of significant difference according to the status of accreditation for four variables (patient safety, quality management, planning—policies and strategies, and involvement of professionals); and no evidence of difference according to the status of accreditation for monitoring patient safety goals in all the items analyzed.

For the impact analysis, only the answers from the accredited organizations were considered (Table 4). Since the number of variables was high, the items were grouped into four dimensions: learning, internal processes, customer and financial [38]. The last component was subdivided into pre- and post-accreditation.

Additionally, questions about the financial impact in the pre-accreditation period were answered and a majority of participants agreed with all the items: investment in infrastructure (77.32%: CI 95% [68.99, 85.65]); information technology (77.90%: CI 95% [69.54, 86.24]); and technological innovation (66.37%: CI 95% [57.09, 76.25]). Contrarily, the post-accreditation items were scored lower than the former items. The average was 2.18 out of 3 for pre-accreditation items and 1.30 out of 3 for post-accreditation items. Twenty participants (20.20%) fully agreed with the analysis of all the items related to the post-accreditation period.

### Hypothesis test

Table 5 shows the results for correlation analysis.

**Table 1** Profile of organizations

| Organizational characteristics       | Frequency | Relative frequency |
|--------------------------------------|-----------|--------------------|
| Ownership                            |           |                    |
| Private                              | 95        | 67.38%             |
| Public                               | 25        | 17.73%             |
| Philanthropic                        | 9         | 6.38%              |
| Beneficiary                          | 7         | 4.96%              |
| Social organization                  | 5         | 3.55%              |
| Type of organization                 |           |                    |
| Hospital                             | 105       | 74.47%             |
| Others                               | 36        | 25.53%             |
| Teaching status                      |           |                    |
| Teaching                             | 90        | 63.83%             |
| Non-teaching                         | 51        | 36.17%             |
| Number of beds                       |           |                    |
| ≤49                                  | 10        | 7.09%              |
| 50–149                               | 35        | 24.82%             |
| 150–500                              | 51        | 36.17%             |
| >500                                 | 7         | 4.97%              |
| Not applicable                       | 38        | 26.95%             |
| Number of employees                  |           |                    |
| 10–49                                | 15        | 10.64%             |
| 50–99                                | 10        | 7.09%              |
| >100                                 | 110       | 78.01%             |
| Not informed                         | 6         | 4.26%              |
| Accreditation status                 |           |                    |
| National program (ONA)               | 85        | 60.28%             |
| International program (JCI or CCHSA) | 4         | 2.84%              |
| National and international program   | 10        | 7.09%              |
| Non-accredited                       | 42        | 29.79%             |

**Table 2** Profile of respondents

| Characteristics                 | Frequency | Relative frequency |
|---------------------------------|-----------|--------------------|
| Sex                             |           |                    |
| Female                          | 115       | 81.56%             |
| Male                            | 26        | 18.44%             |
| Average age (years)             | 40        |                    |
| Education level                 |           |                    |
| Post-doctorate and/or doctorate | 6         | 4.26%              |
| Master degree                   | 24        | 17.02%             |
| Post-graduate and/or MBA        | 94        | 66.66%             |
| Graduate                        | 13        | 9.22%              |
| Undergraduate or other          | 4         | 2.84%              |
| Position                        |           |                    |
| CEO or director                 | 20        | 14.19%             |
| Manager or Head of Department   | 59        | 41.84%             |
| Supervisor or coordinator       | 35        | 24.82%             |
| Others                          | 27        | 19.15%             |

In this study, ‘organizational and financial impacts’ were defined to assess the direct impact of accreditation in healthcare organizations, totaling 26 questions (Table 5). According to the descriptive analysis, the concordance rates were observed to be high for most of the questions, indicating that the factors identified in the literature are suitable for evaluation in this research. The most relevant impacts of accreditation were identified, 13 out of 26 items, which were described in Figure 2. Figure 2 also presents an overview of the main findings: the variables with confirmed correlation with the accreditation status and the main activities of accredited

organizations. The activities performed for at least 75% of the organizations [32] were considered. Based on this criterion, only one activity was found to be common among the non-accredited organizations (‘development of Mission, Vision and Values’ is implemented by 75.00%) for the four variables related to accreditation.

Concerning the quality of the research instrument, Cronbach’s alphas for reliability analysis were satisfactory for all the scales (Coefficient = 0.748–0.993) and for the full questionnaire (Coefficient = 0.969). All factor-loading scores were above the 0.50 cutoff, except for 12 out of 104 items, suggesting that the convergent validity can be improved through in-depth analysis. Additionally, the inter-scale correlation ranged from 0.007 (between ‘involvement of professionals’ and ‘financial impact’) to 0.624 (between ‘quality management activities’ and ‘planning—policies and strategies’). For all the scales, each inter-scale correlation was below the square root of the average variance extracted (AVE), except between ‘quality management activities’ (square root AVE = 0.618) and its correlation with ‘planning—policies and strategies.’ However, it was deemed acceptable.

## Discussion

The results suggest that accreditation contributed to implementing and performing ‘patient safety activities’, ‘quality management activities’, ‘quality-related policy and strategy planning’ and ‘involvement of professionals in quality programs’. These measures are perceived to contribute toward better outcomes. Additionally, it was found that the ‘patient involvement’ and ‘monitoring patient safety goals’ should be managed by organizations with their respective policies. The variables related to quality activities were influenced by the type of accreditation, and not by the type of organization (hospital or other), administrative control (private or other), and ISO 9001 status. Additionally, organizational impacts of accreditation were identified through the internal processes, learning and customers.

The lack of evidence of correlation between the ‘monitoring patient safety goals’ and accreditation status, coupled with the high percentage of organizations that claimed to have implemented these activities, can be justified by the current Brazilian regulations. In Brazil, it is compulsory to present to the government a monthly report on the adverse events that occur in an organization.

The evidence of correlation between the activities carried out by organizations for professionals’ involvement in quality programs and the accreditation status of these organizations reinforces the importance of achieving internal and external collaborations. Professionals’ involvement in quality programs can directly influence some of the organizational impacts confirmed in this study, such as consolidating a culture of quality, patient safety, measurement of results, sectorial integration and employee training.

## Comparison with earlier studies

The current findings on ‘patient safety activities’ are compared with the previous studies’ findings. According to the study performed with Hungarian hospitals [32], there is no correlation between these activities and the accreditation status, contrary to this research. Additionally, the average implementation of such activities is higher in Brazil. This difference could be explained by the structure of the Brazilian national accreditation program, which highlights patient safety as an objective.

The evidence of a correlation between the accreditation status and ‘quality management activities’ supports the vision of accreditation as

**Table 3** Independent variables and related activities in the Brazilian healthcare organizations (N = 141)

| Quality activities   | % of organizations with activity present |                                   |
|--|--|-----------------------------------|
|  | Accredited                               | Non-accredited                    |
| <b>Patient safety</b>  |  |                                   |
| 1. Adverse event reporting system  | 91.92 [86.55; 97.29]                     | 65.85 [51.33; 80.37] <sup>a</sup> |
| 2. Patient safety committee  | 90.53 [84.64; 96.42]                     | 63.41 [48.67; 78.15] <sup>a</sup> |
| 3. Risk management   | 90.91 [85.25; 96.57]                     | 59.52 [44.67; 74.37] <sup>a</sup> |
| 4. Accident committee  | 77.90 [69.54; 86.24]                     | 50.00 [34.50; 65.50] <sup>a</sup> |
| 5. Commitment of management  | 85.86 [79.00; 92.72]                     | 69.05 [55.07; 83.03]              |
| 6. Patient safety training   | 90.72 [84.95; 96.49]                     | 66.67 [52.41; 80.93] <sup>a</sup> |
| 7. Delineation of resources  | 77.42 [68.92; 85.92]                     | 38.89 [22.96; 54.82] <sup>a</sup> |
| 8. Usage of adverse event reporting system   | 87.88 [81.45; 94.31]                     | 67.50 [52.98; 82.02]              |
| 9. Prevention of falls   | 96.74 [93.11; 100.37]                    | 62.50 [47.50; 77.50] <sup>a</sup> |
| 10. Prevention of medication (administration) errors   | 88.17 [81.61; 94.73]                     | 48.72 [33.03; 64.41] <sup>a</sup> |
| 11. Reporting near misses  | 68.82 [59.41; 78.23]                     | 45.71 [29.21; 62.21]              |
| <i>Average number of activities</i>  | 9.17/11 (SD 2.07)                        | 6.10/11 (SD 3.33)                 |
| <b>Quality management</b>  |  |                                   |
| 1. Development of Mission, Vision and Values   | 95.96 [92.08; 99.84]                     | 75.00 [61.58; 88.42] <sup>a</sup> |
| 2. Strategic planning  | 83.84 [76.59; 91.09]                     | 47.62 [32.52; 62.72] <sup>a</sup> |
| 3. Deployment and management of goals  | 78.79 [70.74; 86.84]                     | 29.27 [15.34; 43.20] <sup>a</sup> |
| 4. Process standardization   | 89.90 [83.96; 95.84]                     | 35.72 [21.22; 50.20] <sup>a</sup> |
| 5. Definition and use of indicators for process management   | 84.85 [77.79; 91.91]                     | 40.48 [25.63; 55.33] <sup>a</sup> |
| 6. Six sigma improvement projects  | 17.53 [9.96; 25.10]                      | 9.09 [−0.72; 18.9]                |
| 7. Application of Lean service or Lean healthcare methodology  | 13.83 [6.85; 20.81]                      | 9.38 [−0.72; 19.48]               |
| 8. 5S program  | 49.50 [39.64; 59.34]                     | 36.58 [21.85; 51.33]              |
| <i>Average number of activities</i>  | 5.13/8 (SD 1.61)                         | 2.74/8 (SD 2.04)                  |
| <b>Planning—policies and strategies</b>  |  |                                   |
| 1. The accreditation program is part of the strategic plan   | 97.96 [95.16; 100.00]                    | 56.41 [40.85; 71.97] <sup>a</sup> |
| 2. Quality policy  | 97.98 [95.21; 100.00]                    | 57.14 [42.17; 72.11] <sup>a</sup> |
| 3. There is a quality policy that considers the accreditation program  | 97.94 [95.11; 100.00]                    | 60.98 [46.05; 75.91] <sup>a</sup> |
| 4. Quality guideline   | 80.61 [72.78; 88.44]                     | 27.50 [13.66; 41.34] <sup>a</sup> |
| 5. Quality objectives  | 88.89 [82.70; 95.08]                     | 50.00 [34.88; 65.12] <sup>a</sup> |
| 6. Quality objectives are measured   | 79.80 [71.89; 87.71]                     | 35.00 [20.22; 49.78] <sup>a</sup> |
| 7. Quality action plan   | 90.91 [85.25; 96.57]                     | 51.22 [35.92; 66.52] <sup>a</sup> |
| 8. Annual quality report   | 66.33 [56.97; 75.69]                     | 41.46 [26.38; 56.54] <sup>a</sup> |
| 9. Critical analysis of the quality management system carried out by the senior management periodically  | 71.72 [62.85; 80.59]                     | 43.90 [28.71; 59.09] <sup>a</sup> |
| <i>Average number of activities</i>  | 7.68/9 (SD 1.88)                         | 4.12/9 (SD 3.05)                  |
| <b>Patient involvement</b>   |  |                                   |
| 1. Evaluating quality goals  | 43.75 [33.83; 53.67]                     | 26.83 [13.27; 40.39]              |
| 2. Development of quality criteria   | 53.61 [43.69; 63.53]                     | 31.71 [17.47; 45.95]              |
| 3. Committees and improvement projects   | 41.84 [32.07; 51.61]                     | 37.50 [22.50; 52.50]              |
| 4. Development of quality guidelines   | 50.00 [40.10; 59.90]                     | 26.83 [13.27; 40.39]              |
| 5. Involvement of family members   | 58.70 [48.64; 68.76]                     | 30.00 [15.80; 44.20] <sup>a</sup> |
| 6. Patient satisfaction surveys  | 91.84 [86.42; 97.26]                     | 73.17 [59.61; 86.73]              |
| 7. Formal process for communication with patients regarding their questions, suggestions and complaints  | 88.78 [82.53; 95.03]                     | 73.17 [59.61; 86.73]              |
| <i>Average number of activities</i>  | 4.21/7 (SD 1.93)                         | 2.90/7 (SD 2.05)                  |
| <b>Involvement of professionals</b>  |  |                                   |
| 1. Physician   | 75.00 [66.34; 83.66]                     | 41.46 [26.38; 56.54] <sup>a</sup> |
| 2. Other health professionals working in the organization  | 91.84 [86.42; 97.26]                     | 54.76 [39.71; 69.81] <sup>a</sup> |
| 3. Professionals in the administrative area  | 92.93 [87.88; 97.98]                     | 57.14 [42.17; 72.11] <sup>a</sup> |
| 4. Professionals in the support areas (maintenance, cleaning, and others)  | 93.81 [89.01; 98.61]                     | 54.76 [39.71; 69.81] <sup>a</sup> |
| 5. Third-party service providers   | 78.57 [70.45; 86.69]                     | 28.57 [14.91; 42.23] <sup>a</sup> |
| <i>Average number of activities</i>  | 4.26/5 (SD 1.16)                         | 2.36/5 (SD 2.14)                  |
| <b>Monitoring patient safety goals</b>   |  |                                   |
| 1. Over a period of time, there was an increase in adverse events report   | 90.91 [85.25; 96.57]                     | 72.50 [58.66; 86.34]              |
| 2. Over a period of time, there was an increase in near miss report  | 81.25 [73.44; 89.06]                     | 75.76 [61.14; 90.38]              |
| 3. The reporting of adverse events and near misses has allowed reviewing the procedures to reduce the probability of new events with the same cause                | 98.98 [96.99; 100.97]                    | 94.59 [87.30; 101.88]             |
| 4. The reporting of adverse events and near misses has allowed reviewing the procedures to reduce the severity (impact for the patient) of potential future events | 95.92 [92.00; 99.84]                     | 89.19 [79.18; 99.20]              |
| <i>Average number of activities</i>  | 3.63/4 (SD 0.75)                         | 3.05/4 (SD 1.34)                  |

<sup>a</sup>indicated that there is no overlap between CI of accredited and CI of non-accredited organizations.

**Table 4** Organizational impacts perceived by accredited organizations ( $N = 99$ )

| Items   | % of organizations that agree |                  |
|---|-------------------------------|------------------|
| Organizational impact   |                               |                  |
| Learning  |                               |                  |
| 1. Enhanced quality and patient safety cultures   | 97.98%                        | [95.21; 100.75]  |
| 2. Develop a culture of measurement   | 100.00%                       | [100.00; 100.00] |
| 3. Improve workers' safety  | 88.89%                        | [82.70; 95.08]   |
| 4. Improve professional qualification   | 98.99%                        | [97.02; 100.96]  |
| 5. Increase workers' satisfaction   | 78.57%                        | [70.45; 86.69]   |
| Internal process  |                               |                  |
| 1. Performance improvement  | 96.94%                        | [93.53; 100.35]  |
| 2. Standardization of care processes  | 100.00%                       | [100.00; 100.00] |
| 3. Conduct an objective assessment of quality   | 97.96%                        | [95.16; 100.76]  |
| 4. Increase the integration between departments   | 97.98%                        | [95.21; 100.75]  |
| 5. Improve internal communication   | 90.91%                        | [85.25; 96.57]   |
| 6. Have a platform for change   | 90.43%                        | [84.48; 96.38]   |
| 7. Compliance with external requirements (regulations)  | 97.96%                        | [95.16; 100.76]  |
| 8. Continuous quality improvement   | 98.99%                        | [97.02; 100.96]  |
| 9. Implementation of new procedures based on accreditation guidelines and its recommendations | 97.96%                        | [95.16; 100.76]  |
| 10. Compliance with external programs guidelines  | 72.37%                        | [62.31; 82.42]   |
| 11. Improve quality of service  | 96.97%                        | [93.59; 100.35]  |
| Customer  |                               |                  |
| 1. Improve institutional image of quality and reliability                                     | 92.93%                        | [87.88; 97.98]   |
| 2. Increase patient satisfaction  | 89.69%                        | [83.64; 95.74]   |
| 3. Gain competitive advantage   | 92.78%                        | [87.63; 97.93]   |
| 4. Make the service more humanized  | 87.76%                        | [81.27; 94.25]   |
| 5. Attract more customers   | 62.50%                        | [52.38; 72.62]   |
| 6. Operate on the medical tourism markets   | 19.35%                        | [9.52; 29.18]    |
| Financial impact (post-accreditation)   |                               |                  |
| 1. Increase the opportunities of obtaining financial resources                                | 61.90%                        | [51.51; 72.29]   |
| 2. Expenditure reduction  | 41.57%                        | [31.33; 51.81]   |
| 3. Increase the number of patients and the revenue  | 45.35%                        | [34.83; 55.87]   |
| 4. Positive financial impact on the organization results                                      | 51.11%                        | [40.78; 61.44]   |

**Table 5** Hypotheses test of the relationship between the status of accreditation and the input variables ( $\alpha = 0.05$ )

| Hypothesis   | Independent variable <sup>a</sup> | Correlation coefficient | P-value | Coefficient of determination | Result          |
|--|-----------------------------------|-------------------------|---------|------------------------------|-----------------|
| H <sub>0</sub> : There is <u>no relationship</u> between 'independent variable' and the status of accreditation <sup>b</sup> | Patient safety activities         | 0.537                   | 0.000   | 31.09%                       | Fail to support |
|  | Quality management activities     | 0.590                   | 0.000   | 39.39%                       | Fail to support |
|  | Planning—policies and strategies  | 0.629                   | 0.000   | 42.14%                       | Fail to support |
|  | Patient involvement               | 0.252                   | 0.003   | 11.03%                       | Support         |
|  | Involvement of professionals      | 0.430                   | 0.000   | 25.49%                       | Fail to support |
|  | Monitoring patient safety goals   | 0.216                   | 0.012   | 23.35%                       | Support         |

<sup>a</sup>Independent variables: equal to the sum of 'Yes' answers, with the exception of the last variable (monitoring patient safety goals), which considered the 'Agree' answers. <sup>b</sup>Accreditation status: 1, non-accredited; 2, accredited by ONA at level I; 3, accredited by ONA at level II; 4, accredited by ONA at level III, international accreditation, or more than one accreditation.

an important quality management model. Several issues evaluated (mission, strategic planning, deployment and management goals, and standardization and indicators) are also common to excellence models (such as excellence framework for organizational management (EFQM)) and other quality management models (such as ISO 9001). The correlation of these activities with accreditation status strengthens the literature review results in that there is a convergence between accreditation and other quality certifications [39–43].

In the financial dimension, the result validates the literature review that discusses the significant time and resources involved in the process of obtaining accreditation. Implementation requires careful planning, and therefore some key success factors for improving quality and safety should be considered [44]. This should be considered in the decision to implement the accreditation program for a healthcare organization or from a national health system perspective [17, 26, 45, 46].



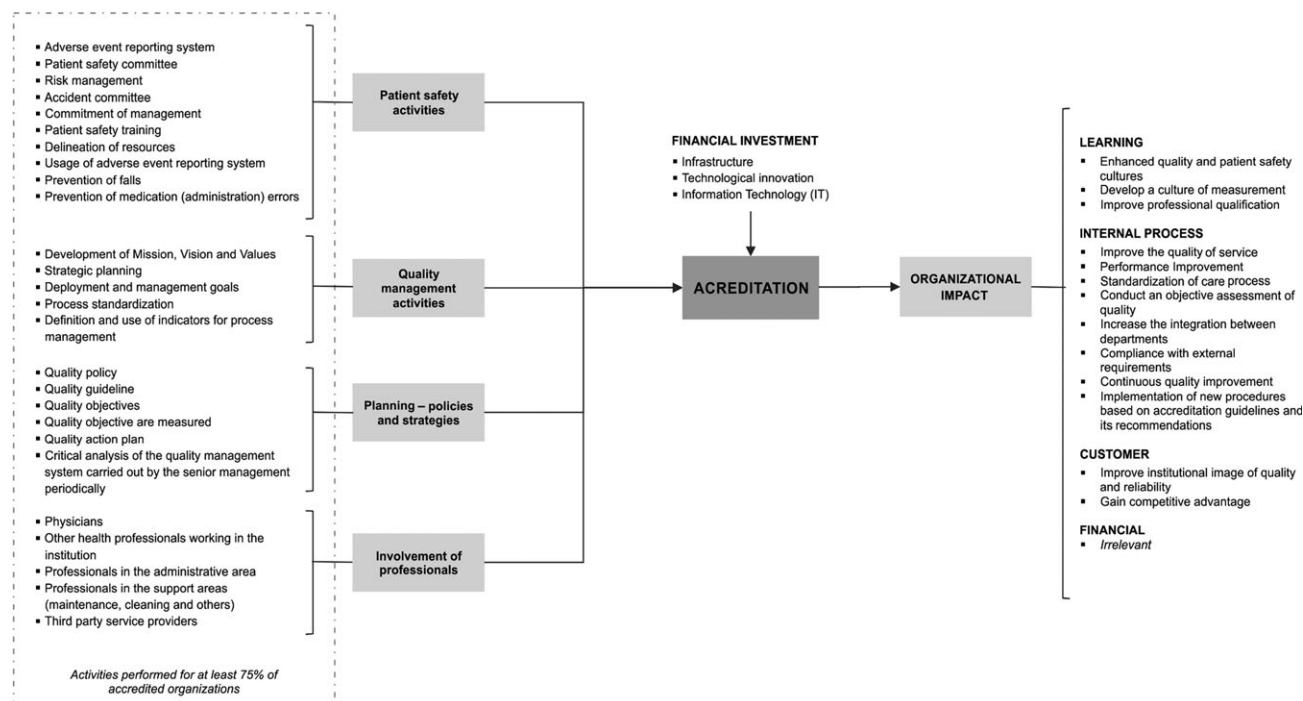


Figure 2 Overview of the main research findings—Accreditation's impacts on healthcare organizations.

## Implications

The main learning from this research has implications for healthcare organizations; it indicates that personal efforts and investments can improve internal processes and organizational image, consolidate a patient safety culture and equip employees.

For non-accredited organizations, the results may contribute mainly to the five issues of the planning stage. First, results clarify that understanding both organizational and financial impacts is important for aligning expectations while making the decision to seek accreditation. Second, the findings clarify the importance of strategic planning and activities for obtaining accreditation at the senior management level. Third, in the planning phase, organizations should consider the financial dimensions, infrastructural investments, technological innovations and information technology. Fourth, they should consider investing in training, which was cited by most organizations as a tool for change. Finally, an average time of ~2 years of preparation can be planned for accreditation. Additionally, organizations should use their respective policies to manage the patient involvement issue, since there is no correlation between the activities carried out by organizations and accreditation status.

The healthcare segment can further explore the proven gains of Lean service, Six Sigma and 5 S program in other sectors.

## Limitations

Some methodological choices may limit the generalization of the research findings. The first limitation is associated with responses based on the perception and interpretation of respondents, which can be a source of positive bias. However, the impact of this limitation was expected to be reduced by the internal approval process, the selection of respondents by the administration, and the profile of respondents. Additionally, some respondents informed they taken help from other organizational members to answer the

questionnaire. The second limitation refers to the use of a non-probabilistic sample that may introduce bias into the analysis, and hence the sample might not represent the entire population. Another limitation can be associated with the fact that the Brazilian national program (ONA) accredited a majority of organizations.

In addition, unlike previous studies, this study has not used outcome measures to evaluate the accreditation impact [31, 32].

Finally, the lack of response from many hospitals might have led to self-selection. A few organizations formally communicated their decision to decline the invitation due to their situations, and a reversal in situation was possible in some cases.

## Suggestions for future studies

The results allow for identifying future research possibilities in the following areas: measurement of costs in the initial phase of obtaining the accreditation is an underexplored area and the reasons behind low utilization of Lean healthcare methodologies, Six Sigma and 5 S program in the healthcare sector.

The study can look into identifying suitable indicators for assessing the impact of accreditation on the results and checking whether they are implemented by the organizations. The dimension of financial impact is a complex issue due to difficulty in isolating the effect of the forward funding program on other initiatives; thus, the discussion on indicators can help its analyses. Monitoring specific indicators can contribute to a deeper analysis and either validate the results of this research (no financial impact on the results) or identify whether it is not perceived because it has not been measured.

Finally, regarding monitoring patient safety indicators, evaluation measures focused on the analysis of indicators of adverse events and near misses. Additional indicators, such as those based on clinical registries [47] or the Organization for Economic Cooperation and Development (OECD) framework [48], could also be considered in future studies.

## Conclusion

Accreditation primarily influences internal processes, culture, training, institutional image and competitive differentiation. Regarding the financial dimension, accreditation's impact on the result shows little relevance when compared to the other items evaluated. However, its impact on the consolidation of a culture of quality, patient safety and measurement leads to significant organizational changes.

This result shows that accreditation leads the organizations to implement best practices for quality management and patient safety. Moreover, the evident convergence between accreditation and other quality models suggests that accreditation enables the implementation of consolidated management practices in other sectors.

## Supplementary material

Supplementary material is available at *International Journal for Quality in Health Care* online.

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## Ethics approval

The Research Ethics Committee of the Faculty of Medicine, University of São Paulo, Brazil (# 1540061), approved the study. According to the Brazilian Law, informed participant consent was required from all the participating organizations.

## Conflict of interest

One of the authors was member of the National Accreditation Organization (ONA). Therefore, the database was not shared with her. Additionally, she was not involved in the data analysis phase. The other authors report no conflict of interest.

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