METRICS OF ASSISTANCE INDICATORS OF CERTIFIED HOSPITALS
MÉTRICA DE INDICADORES ASSISTENCIAIS DE HOSPITAIS CERTIFICADOS
MÉTRICA DE INDICADORES ASISTENCIALES DE HOSPITALES CERTIFICADOS

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ABSTRACT

Objective: to verify the association of care indicators and the level of certification of institutions. **Method:** quantitative, documentary and retrospective study, developed in five hospitals accredited by the Brazilian Accreditation Program and members of the Regional Health Department VII. The analysis of the data occurred by descriptive statistics. For the projection, we used the Integrated Autoregressive Model of Moving Average. **Results:** Institutions showed significant values in the quantitative of notifications; Institution A presented a higher incidence of events, followed by Institution C. Events such as medication error, fall and pressure injury were the most reported. Among the interventions proposed, we highlight the changes or implantations of protocols, training and the insertion of other professionals and / or commissions in the analysis and treatment of events. The projections of the indicators were presented for the next five years. **Conclusion:** The institution with the highest level of certification does not confirm the hypothesis of having better results in the care indicators, however, it shows a consistency in the results, demonstrating a more deeply rooted security culture in the organization. **Descriptors:** Hospital Accreditation; Quality of Health Care; Quality Indicators, Health Care; Quality Assurance, Health Care; Patient Safety; Nursing.

RESUMO

Objetivo: verificar a associação dos indicadores assistenciais e o nível de certificação das instituições. **Método:** estudo quantitativo, documental e retrospectivo, desenvolvido em cinco hospitais acreditados pelo Programa Brasileiro de Acreditação e integrantes do Departamento Regional de Saúde VII. A análise dos dados ocorreu pela estatística descritiva. Para a projeção, utilizou-se o Modelo Autorregressivo Integrado de Média Móvel. **Resultados:** as instituições demonstraram valores significativos no quantitativo de notificações; a Instituição A apresentou maior incidência de eventos, seguida pela Instituição C. Eventos como erro de medicação, queda e lesão por pressão foram os mais notificados. Dentre as intervenções propostas, destacaram-se as alterações ou implantações de protocolos, treinamentos e a inserção de outros profissionais e/ou comissões na análise e tratativa dos eventos. Foram apresentadas as projeções dos indicadores para os próximos cinco anos. **Conclusão:** A instituição com maior nível de certificação não confirma a hipótese de ter melhores resultados nos indicadores assistenciais, entretanto, apresenta uma constância nos resultados demonstrando uma cultura de segurança mais arraigada na organização. **Descritores:** Acreditação Hospitalar; Qualidade da Assistência à Saúde; Indicadores de Qualidade em Assistência à Saúde; Garantia da Qualidade dos Cuidados de Saúde; Segurança do Paciente; Enfermagem.

RESUMEN

Objetivo: verificar la asociación de los indicadores asistenciales y el nivel de certificación de las instituciones. **Método:** estudio cuantitativo, documental y retrospectivo, desarrollado en cinco hospitales acreditados por el Programa Brasileño de Acreditación y integrantes del Departamento Regional de Salud VII. El análisis de los datos ocurrió por la estadística descriptiva. Para la proyección, se utilizó el Modelo Auto Regresivo Integrado de Media Móvil. **Resultados:** las instituciones demostraron valores significativos en el cuantitativo de notificaciones; la Institución A presentó una mayor incidencia de eventos, seguida por la Institución C. Eventos como de error de medicación, caída y lesión por presión fueron los más notificados. Entre las intervenciones propuestas se destacaron las alteraciones o implantaciones de protocolos, entrenamientos y la inserción de otros profesionales y / o comisiones en el análisis y trata de los eventos. Se presentaron las proyecciones de los indicadores para los próximos cinco años. **Conclusión:** la institución con mayor nivel de certificación no confirma la hipótesis de tener mejores resultados en los indicadores asistenciales, sin embargo, presenta una constancia en los resultados, demostrando una cultura de seguridad más arraigada en la organización. **Descritores:** Acreditación de Hospitales; Calidad de la Atención de Salud; Indicadores de Calidad de la Atención de Salud; Garantía de la Calidad de Atención de Salud; Seguridad del Paciente; Enfermería.

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INTRODUCTION

The quality and safety of patients in health care institutions are being considered essential issues, driving the search for strategies to ensure safe and harmless care. In this perspective, Brazilian health institutions have sought ways to evaluate their work processes, in accordance with the needs and expectations of their patients, family and professionals, making it imperative that tools be used in order to enable the quality assessment.

The accreditation process is widely seen as a form of quality assurance that often feeds on process improvement activities aligned with organizational priorities. There is consistency in this strategy when an organization and its team realize that accreditation is aligned with their beliefs, context, and service delivery model. The improvement action is proposed in response to observations, feedback or self-reflection in the current scenario. There is alignment in concepts influenced by individual characteristics, internal and external factors.¹

By adhering to quality and certification programs, institutions seek to ensure the quality of care provided to patients by monitoring indicators. In addition to the question of certification, the use of indicators has been intensified to compare health organizations and bring them to a level of superiority and competitive advantage.²

There is growing concern among managers regarding the construction and validation of indicators that can be compared intra- and extra-institutionally, reflecting the different contexts of professional practice and with the objective of measuring the quality of care. There is a consensus that it is essential to opt for adequate evaluation systems and performance indicators to support the administration of services and to facilitate decision making, minimizing the degree of uncertainty. In addition, to ensure the success and improvement of these assessments, it is necessary to adopt models that allow monitoring and measurement of results.³

However, a study in Australia suggests a possible disconnect between how accreditation questionnaires assess compliance with rules and regulations and the ability to measure the impact of accreditation on the results of indicators.⁴

In view of these statements, it is questioned whether the accreditation process adopted in health facilities has contributed to the improvement of care processes and is

reflected in the results of the indicators monitored in these services.

OBJECTIVE

- To verify the association between the results of the care indicators and the level of certification of the institutions.
- To analyze the proposed interventions and project the results of the indicators for the next five years.

METHOD

A quantitative, documentary and retrospective study carried out in five hospitals certified by the Brazilian Accreditation Program of the National Accreditation Organization (NAO), a non-governmental and non-profit entity, certifying the quality of health services in Brazil with a focus on patient safety.

Level 1 - Accredited - corresponds to institutions that meet patient safety criteria, in all areas of activity, including structural and care aspects; Level 2 - Accredited Plenary - has, as a principle, the organization of processes, requiring hospital care planning; Level 3 - Accredited for Excellence - is awarded to institutions that demonstrate an organizational culture of continuous improvement, with institutional maturity.

The inclusion criteria were: to be accredited by the NAO methodology for at least 12 months; use the indicators of medication error, unplanned output of oro / nasogastroenteral (SONGE), phlebitis, patient drop, pressure lesion, unplanned extubation and to be located in a municipality of the Regional Department of Health (RDH) VII of the State from Sao Paulo. The RDH VII is part of the São Paulo State Department of Health (SES-SP) covering 42 municipalities and approximately four million inhabitants.

The institutions that accepted to participate in this study were coded in letters A, B, C, D and E in order to preserve anonymity.

Institution A is a philanthropic hospital, university, large, tertiary level and 355 active beds. It serves patients from the Unified Health System (UHS) and Private and Private Agreements. It is accredited by NAO, Level 1, since 2010, being the first university hospital in Brazil to integrate the contingent of certified hospitals. It reached Level 2 in 2014. Since 2006, it has a Quality Service with the purpose of promoting actions to improve work processes. In this institution, the analysis of the indicators is carried out monthly, in a multidisciplinary way.

Institution B is characterized as a private, medium-sized, tertiary level hospital with 120 beds. It also serves patients from the Unified Health System (UHS) and Private and Private Agreements. It has been accredited by NAO, Level 1 since 2008. The Quality Office works in conjunction with a Permanent Education Service. For the monthly analysis of the indicators, there is the participation of the manager of each unit and members of the Risk Management Committee.

Institution C is a large philanthropic hospital, tertiary level and 220 beds. Serves only Private and Private Agreements. Since 2005, this Institution has obtained Level 2 accreditation and, in 2008, obtained Level 3 accreditation. Since 1996, it has been certified by the Commitment to Hospital Quality (CHQ). Nurses trained by the Risk Management Committee carry out monthly the analysis of the indicators of health care risk.

Institution D is also a philanthropic hospital, medium-sized, secondary level and 120 beds, accredited by NAO Level 1 since 2009. It attends Private and Private Agreements. At the beginning of the implementation of the indicators, the analysis of the results was carried out by the professionals assigned to the Quality Office and, since 2012, these analyzes have been carried out by the managers of each area who present their results to the hospital community.

Institution E is a large philanthropic institution with 198 beds, a tertiary level, specializing in the maternal and child area and a regional reference center in the Neonatal Intensive Care Unit (NICU). It serves patients from the Unified Health System (UHS) and Private and Private Agreements. Since 2008, NAO Level 1 has been certified. It achieved Level 2 in 2014. The indicators are analyzed monthly by the coordinators of each unit together with the team involved in the occurrence of the event.

The data collection took place in 2014 considering the historical series of indicators that occurred in the last four years: medication error; unplanned output from SONGE; phlebitis; patient fall; pressure injury and unplanned extubation.

The data were extracted through the analysis of the Quality Services databases of the institutions and a structured instrument. We analyzed the historical series of indicators in the last four years and the interventions proposed for each indicator.

The data were stored in Excel spreadsheet and processed in the Microsoft Excel system and statistical software Statistical Package for Social Science (SPSS 22).

The Auto Regressive Integrated Moving Averages (ARIMA) model was used to project the results of the indicators of the next five years. This method is used to construct forecast models, providing probabilistic confidence intervals for projections, based on observations from the past. The Akaike information criterion made it possible to find the best model in each case represented as ARIMA (0, 0, 0). The parameters were: the first one, of the autoregressive range; the second, for the number of differentiations (which controls trend) and the third for the number of moving averages.⁶ The lower and upper limits were calculated considering a 95% confidence interval.

The research project was approved by the Research Ethics Committee (REC) of the university under the number CAAE: 15453113.0.0000.5392.

RESULTS

The hospitals were characterized as follows: four (80.0%) philanthropic and one (20%) private; four (80.0%) general hospitals and one (20.0%) specialized. Regarding the level of complexity, four (80.0%) were tertiary and one (20.0%), secondary. Regarding the size, three (60.0%) were considered as large and two (40.0%), medium-sized. Regarding the certification level, two (40.0%) were NAO Level 1; (40.0%), NAO Level 2 and one (20.0%), NAO Level 3. Regarding the time of accreditation, three (60.0%) hospitals were accredited for more than five years and two (40.0%), for five years or less.

Table 1. Incidence of events occurring in the four-year period per Institution. Campinas (SP), Brazil, 2014.

Events	Year	Institution A	Institution B	Institution C	Institution D	Institution E
Medication error	2010	0.0	8.2	0.2	0.0	0.0
	2011	4.8	8.3	0.2	0.1	0.1
	2012	4.5	8.1	1.0	0.2	0.4
	2013	3.7	0.0	0.0	1.0	0.8
Fall	2010	0.0	1.1	0.9	0.0	0.0
	2011	4.9	2.1	0.9	0.4	0.3
	2012	5.9	1.3	1.2	0.1	1.0
	2013	4.9	0.0	0.0	0.3	0.8
Pressure lesion	2010	0.0	1.6	2.1	0.0	0.0
	2011	1.7	5.3	4.0	0.0	0.0
	2012	1.7	4.0	2.6	1.2	0.0
	2013	0.6	0.0	0.0	0.4	0.0
Unplanned output from SONGE ^a	2010	0.0	0.8	2.2	0.0	0.0
	2011	1.7	1.0	1.6	1.2	0.0
	2012	1.4	0.6	1.6	0.6	0.0
	2013	0.6	0.0	0.0	0.2	0.0
Unplanned Extubation	2010	0.0	0.7	2.1	0.0	0.0
	2011	3.1	0.4	1.1	0.2	0.0
	2012	1.9	0.3	1.7	0.4	0.0
	2013	0.9	0.0	0.0	0.2	0.0
Phlebitis	2010	0.0	0.3	0.5	0.0	0.0
	2011	3.3	0.2	0.4	0.1	0.0
	2012	1.0	0.2	0.4	0.1	0.1
	2013	1.8	0.0	0.0	0.2	0.0

^aSONGE- oro / nasogastroenteral probe

Table 1 shows that Institution A has the highest incidences of events, followed by Institution C, inferring greater constancy in the notifications. Institution E has the lowest incidences, and for the events of pressure injury, unplanned withdrawal of SONGE and unplanned extubation, no notification was

recorded in the period. The events of medication errors, fall and pressure injury presented the highest incidences among the other events. The reduction in the incidence of events was observed over the four years in the whole sample.

Table 2. Main interventions proposed for each type of event. Campinas (SP), Brazil, 2014.

Interventions	Medication error		Fall		Pressure lesion		Unplanned output of SONGE ^a		Unplanned extubation		Phlebitis	
	N	%	N	%	N	%	N	%	N	%	N	%
Protocol change or deployment	4	80.0	3	60.0	5	100.0	3	60.0	4	80.0	4	80.0
Trainings	5	100.0	3	60.0	1	20.0	2	40.0	1	20.0	5	100.0
Insertion of other professionals or commissions	0	0.0	0	0.0	4	80.0	4	80.0	3	60.0	4	80.0
Acquisition or application of new products	0	0.0	0	0.0	4	80.0	3	60.0	0	0.0	4	80.0
Modification of physical structure and / or equipment	0	0.0	4	80.0	0	0.0	0	0.0	0	0.0	0	0.0
Change of culture	4	80.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Differentiation of high vigilance drugs	4	80.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0

^aSONGE- oro / nasogastroenteral probe

Among the interventions proposed to minimize the occurrence of events, the changes or implantations of protocols followed by training and the inclusion of other professionals and / or commissions in the

analysis and treatment of events were highlighted (Table 2). In the medication error event, the change in culture was cited by most institutions, probably due to the history of underreporting of this event.

Table 3. Calculation of the ARIMA model by the Akaike criterion by event and Institution. Campinas (SP), Brazil, 2014.

Evento	Institution A	Institution B	Institution C	Institution D	Institution E
Medication error	(0.0.0)	(0.0.0)	(0.1.0)	(1.1.1)	(3.1.0)
Fall	(0.0.0)	(0.0.1)	(0.0.0)	(0.0.0)	(0.0.1)
Pressure lesion	(1.0.0)	(2.0.0)	(0.1.1)	(0.0.1)	(0.0.0)
Unplanned output from SONGE &	(1.0.0)	(0.0.0)	(0.1.1)	(0.1.2)	sem ajuste
Unplanned Extubation	(0.0.0)	(0.0.1)	(1.0.1)	(0.0.0)	(0.0.0)
Phlebitis	(0.1.2)	(0.0.0)	(0.1.1)	(0.0.1)	(1.0.0)

^aSONGE- oro / nasogastroenteral probe

The Akaike information criterion found the best ARIMA model for calculating the projection in each case (Table 3). In the ARIMA model (0, 1, 1), calculated for the pressure injury event in Institution C, there was a differentiation and the moving averages had a backward forward and one without and

autoregressive. In many cases, the best model was ARIMA (0, 0, 0), which corresponds to the calculation of the mean of the observations, which is the projection. For the unplanned output event of SONGE, from Institution E, there was no variation, so there is no model estimate.

Table 4. Projection and confidence interval of ARIMA time series model of indicators for the subsequent five years. Campinas (SP), Brazil, 2014.

	Institution A					Institution B			Institution C			Institution D		Institution E		
Event	Ano	P ^{\$}	Li ^{\$}	Ls [#]	P ^{\$}	Li ^{\$}	Ls [#]	P ^{\$}	Li ^{\$}	Ls [#]	P ^{\$}	Li ^{\$}	Ls [#]	P ^{\$}	Li ^{\$}	Ls [#]
Medication error	1	4.3	0.0	12.0	8.2	0.0	16.8	0.6	0.0	5.7*	0.6	0.0	2.2	0.6	0.0	1.5
	2	4.3	0.0	12.0	8.2	0.0	16.8	0.6	0.0	6.9*	0.6	0.0	2.3	0.6	0.0	1.8
	3	4.3	0.0	12.0	8.2	0.0	16.8	0.6	0.0	7.9*	0.6	0.0	2.4	0.6	0.0	2.0
	4	4.3	0.0	12.0	8.2	0.0	16.8	0.6	0.0	8.7*	0.6	0.0	2.5	0.6	0.0	2.2
	5	4.3	0.0	12.0	8.2	0.0	16.8	0.6	0.0	9.5*	0.6	0.0	2.6	0.6	0.0	2.3
Fall	1	5.2	0.0	11.9*	1.5	0.0	4.5	1.0	0.0	2.0	0.3	0.0	0.8	0.7	0.0	2.2
	2	5.2	0.0	11.9*	1.5	0.0	4.5	1.0	0.0	2.0	0.3	0.0	0.8	0.7	0.0	2.2
	3	5.2	0.0	11.9*	1.5	0.0	4.5	1.0	0.0	2.0	0.3	0.0	0.8	0.7	0.0	2.2
	4	5.2	0.0	11.9*	1.5	0.0	4.5	1.0	0.0	2.0	0.3	0.0	0.8	0.7	0.0	2.2
	5	5.2	0.0	11.9*	1.5	0.0	4.5	1.0	0.0	2.0	0.3	0.0	0.8	0.7	0.0	2.2
Pressure lesion	1	0.5	0.0	1.9	2.8	0.6	5.1	0.8	0.0	3.7*	3.6	0.0	9.8	0.0	0.0	0.2
	2	0.5	0.0	1.9	2.8	0.6	5.1	0.8	0.0	4.0*	3.6	0.0	9.8	0.0	0.0	0.2
	3	0.5	0.0	1.9	2.8	0.6	5.1	0.8	0.0	4.3*	3.6	0.0	9.8	0.0	0.0	0.2
	4	0.5	0.0	1.9	2.8	0.6	5.1	0.8	0.0	4.6*	3.6	0.0	9.8	0.0	0.0	0.2
	5	0.5	0.0	1.9	2.8	0.6	5.1	0.8	0.0	4.9*	3.6	0.0	9.8	0.0	0.0	0.2
Unplanned output of	1	1.2	0.0	5.0	0.8	0.0	2.2	1.6	0.1	3.2	0.2	0.0	3.0*	-	-	-
	2	1.2	0.0	5.0	0.8	0.0	2.2	1.6	0.1	3.3	0.2	0.0	3.4*	-	-	-

SONGE&	3	1.2	0.0	5.0	0.8	0.0	2.2	1.6	0.1	3.4	0.2	0.0	3.7	-	-	-
													*			
	4	1.2	0.0	5.0	0.8	0.0	2.2	1.6	0.1	3.5	0.2	0.0	4.0	-	-	-
													*			
	5	1.2	0.0	5.0	0.8	0.0	2.2	1.6	0.1	3.6	0.2	0.0	4.3	-	-	-
													*			
Unplan ned extubat ion	1	2.0	0.0	7.8*	0.4	0.0	1.6	1.6	0.0	5.1	0.2	0.0	1.6	0.0	0.0	0.1
	2	2.0	0.0	7.9*	0.4	0.0	1.6	1.6	0.0	5.1	0.2	0.0	1.6	0.0	0.0	0.1
	3	2.0	0.0	7.9*	0.4	0.0	1.6	1.6	0.0	5.1	0.2	0.0	1.6	0.0	0.0	0.1
	4	2.0	0.0	7.9*	0.4	0.0	1.6	1.6	0.0	5.1	0.2	0.0	1.6	0.0	0.0	0.1
	5	2.0	0.0	7.9*	0.4	0.0	1.6	1.6	0.0	5.1	0.2	0.0	1.6	0.0	0.0	0.1
Phlebiti s	1	1.9	0.0	5.6*	0.2	0.0	0.6	0.4	0.0	0.9	0.1	0.0	0.4	0.1	0.0	0.3
	2	1.9	0.0	6.1*	0.2	0.0	0.6	0.4	0.0	1.0	0.1	0.0	0.4	0.1	0.0	0.3
	3	1.9	0.0	6.6*	0.2	0.0	0.6	0.4	0.0	1.1	0.1	0.0	0.4	0.1	0.0	0.3
	4	1.9	0.0	7.1*	0.2	0.0	0.6	0.4	0.0	1.2	0.1	0.0	0.4	0.1	0.0	0.3
	5	1.9	0.0	7.5*	0.2	0.0	0.6	0.4	0.0	1.2	0.1	0.0	0.4	0.1	0.0	0.3

* The most significant data in the sample are marked with the sign (*); \$ P - projection; \$Li - Lower limit; #Ls - Upper limit; & SONGE - gold / nasogastroenteral tube.

Table 4 shows the projections for each indicator of each Institution for the next five years. It is observed that, for models that do not have an autoregressive component, the projections do not change over the months. The most significant sample data are marked

(*) due to their variability or high value. Among them, it is possible to highlight the projection for the error indicator of medication of Institution C, represented in figure 1, below.

Figure 1. Projection and confidence interval of the ARIMA time series model of the medication error indicator of the Institution C. Campinas (SP), Brazil, 2014.

The ranges presented in figure 1 represent the confidence intervals. The smallest range is the range of 80% and the largest is 95%. The projection of the medication error indicator of Institution C shows a variation in the upper limit of 5.7 to 9.5 in the five years indicating the need for immediate intervention of the Institution in the treatment of this event.

DISCUSSION

In Brazil, there are 6,787 hospitals, however, only 264 (3.9%) are certified. Of these, 61 (23.1%) are accredited in Level 1 - Accredited; 83 (31.4%), Level 2 - Accredited

Full and 120 (45.5%), Level 3 - Accredited for Excellence.⁷⁻⁸ These data demonstrate that, despite the discourse of the search for quality and safety in institutions, there are still few that seek to ratify their practices through quality seals. The hospitals that comprise this study are part of the minority of accredited hospitals in the country, with 60.0% of them accredited for more than five years.

In general, Institution A presented the highest number of notifications in almost all its indicators, when compared to the other institutions. This Institution has had a Quality Service since 2006 and achieved Level 1

certification in 2010 and reached Level 2 in 2014. There has been a growth in the number of notifications, over the years, demonstrating a maturity in the process of quality and safety of the patient.

It is suggested that accreditation leads health organizations to implement good quality management practices aligned with a safety culture. In this sense, the assertive choice of a quality model for the implementation is fundamental to the success of the organization. Understanding of the models and their differences can contribute to the decision process on which of them should be implemented according to the short, medium and long term objectives of each organization.⁹ When the choice of the model is assertive and the Institution adheres to the culture of quality and safety, event notifications are encouraged, as can be observed in Institution A.

The certification process reveals positive and negative points for the institutions that adhere to it. Some advantages and difficulties arising from hospital accreditation are identified by quality managers. In this approach, the advantages relate to improvements in management, as well as patient centralization and safety, which translate into advantages in the quality of care. On the other hand, in order for accreditation to be implemented and maintained in the organization, it is difficult to establish an organizational culture for quality and also to reduce the turnover of professionals.¹⁰

Institution B presented significant values in the error indicators of medication and pressure injury, when compared to Institution A. The use of drugs in health institutions occurs through complex multidisciplinary and interconnected processes, interdependent and made up of professionals from different areas such as pharmacists, physicians, nurses, technicians and nursing assistants and, therefore, requires effective communication between the team. Thus, the process of drug use requires an efficient interaction, in order to promote conditions that assist the professionals in the prevention of errors, assuring the patient a safe medication treatment. Medication errors are preventable and preventable. It is justified, therefore, the awareness of the notification of these events and the search for solutions to minimize their occurrence and avoid damages¹¹, fundamental premises for accredited institutions.

Institution C succeeds Institution A in the number of notifications, mainly in the

unplanned output indicator of SONGE. A constant is observed in its indicators, inferring a consolidated systematics in the internal processes and the security culture imbricated in the hospital management system. This perception may be due to the fact that the Institution has adhered to the quality process since 1996, with the achievement of the CQH seal in 2005, obtained full certification by the ONA and, in 2008, certification par excellence.

Management changes are identified after hospital accreditation, with the inclusion of methods for continuous improvement and reorganization of work, the adoption of new administrative tools guided by quality policy and the accountability of the people involved in the process. However, it is worth noting the emergence of challenges to be overcome in order to achieve accreditation, such as incorporating the safety culture into daily practices.¹²

Institutions D and E have few reports on all indicators analyzed. Institution D began its quality process in 2009, with Level 1 certification, and has been intensifying its actions over the years. In some indicators, there is a clear reduction in the number of notifications, inferring the application of effective actions to improve these results.

Certification programs encourage institutions to work on event notifications, analysis and process improvement. In the literature, the main impacts of the identified accreditation were the standardization of the processes; compliance with external programs; organizational culture, contributing to quality and safety; continuous improvement activities and leadership.¹³ In other recent studies, accreditation was considered a good investment because of its effect on strengthening the culture of quality and safety¹⁴ and as the initial step in the process of achieving excellence in hospitals.¹⁵

Institution E has been in the accreditation process since 2009 (Level 1) and obtained, in 2014, Level 2 of the ONA accreditation. The organization has a very specific profile in relation to the other analyzed institutions, which may have contributed with its few expressive results regarding the number of notifications.

Despite the insufficient data on the analysis of the impact of accreditation on the quality of care and on the safety and satisfaction of patients and professionals, accreditation results in broad and positive managerial changes in hospital organizations, changing management practices successfully and in different aspects. Benefits such as the

standardization and mapping of care processes; the increase of physical structure and work organization; improvements in the management of hospital costs; positioning of strategic vision in the market; inclusion of participative leadership, as well as other initiatives that promote quality management, are seen in accredited institutions.¹⁶

Until what year?, There were no studies published in Portuguese / Brazilian language presenting instruments that could be used to evaluate the results of the implementation of quality improvement programs in health organizations, namely in the scope of accreditation, until the publication of a study¹⁷ of face validation and content of the questionnaire titled Quality Improvement Implementation Survey and two complementary scales. The use of this instrument can help to understand how this process affects the hospitals and also the results of this implantation from the perspective of the professionals.

Regarding the type and number of events reported, medication errors, falls and pressure injury presented the highest incidence in this study. Other authors cite falls (45.4) and medication errors (41.3) as more prevalent events in health institutions.¹⁸⁻

¹⁹ According to the Institute for Healthcare Improvement (IHI), three to 20% of patients fall during their hospitalization.²⁰ In a study performed in a large hospital, with a period of analysis similar to this study, it was possible to verify the incidence of falls of 1.37.²¹

Concerning the interventions proposed to improve the performance of care indicators, the most important are the implementation and / or modification of protocols, the insertion of other professionals or commissions, training and the acquisition or application of new products.

The description and implementation of prevention protocols bring the focus of therapeutic action into daily practice, adding knowledge and techniques for the development of improvements and contributing to patients' quality of life.²² The acquisition of new products is a consequence of the incorporation of these knowledges. The involvement of various professional categories in the discussion, analysis and prevention of events is essential for adverse events to be seen as the result of systemic rather than individual failures, avoiding professional blame and strengthening a fair culture. It is worth emphasizing that the inclusion of the professionals who make up the multidisciplinary team is fundamental for the implementation of clinical protocols.

During the accreditation process, there is a significant and gradual increase in the actions of permanent education, resulting in greater involvement of all health staff, either as instructors or recipients of educational actions. The accreditation process influences the organizational development of the institution and, thus, favors a relationship between health professionals, aiming to offer quality and safety to the patient, demonstrating the importance of becoming aware of the multidisciplinary work.²³

In the event of medication error, we also highlighted changes in culture (80.0%) and differentiation of high-vigilance medications (80.0%). It is worth remembering that the development of people should be part of every quality initiative. However, it is pointed out that, regarding the implementation of the quality management system in hospitals, the subjective dimension of the employees' involvement, the integration of professionals and the reconciliation of interests between workers and managers have not been considered. Organizations should focus effectively on the development and enhancement of workers. However, in order for it to occur effectively and effectively, the professionals must be in line with the company's objectives, ie, they must be convinced of the necessity and validity of the project, as well as the definition of its actions, guaranteeing the implementation and continuity of certification. The performance of the Senior Management is essential to this process, since it must relate directly to the work teams, allowing an open communication for the change in the institution's quality and safety culture.²⁴

As for high vigilance drugs, these are characterized by greater risk of injuring the patient when the use process fails. The errors that occur with these drugs are not habitual, but when they occur, they have high severity and can lead to lasting or irreversible injuries, compromising patient safety¹¹ and justifying the relevance of differentiating such drugs, as proposed by four institutions.

In the interventions related to the event, the importance given to the modifications in the physical structure or the acquisition of equipment was reinforced by the opinion of health professionals, who reported the need for actions aimed at improving the quantity, quality and maintenance of materials and equipment, as well as the improvement of the physical structure of the work environment for the reduction of the events.²⁵

The great advantage of the ARIMA method for the projection of the indicators is that it

provides probabilistic confidence intervals for the projections and presents better results than the other statistical methods, since the series presented in this research is considered long.

In view of the statistical projections, it was verified that the vast majority of the indicators show an increase in the number of notifications, mainly in the indicators of unplanned output of SONGE in Institution D; phlebitis, in Institution A and medication error, in Institution C.

Thus, for SONGE's unplanned exit indicator, projections showed a proportional increase of 43% in the number of notifications at the end of the fifth year. For phlebitis, the increase is 34% and for the medication error, 67%.

The projections were made with the purpose of assisting in the decision-making process of the managers. Such projections can be considered as reflecting a set of actions implemented by health professionals, to encourage the notifications of events, demonstrating a maturity regarding the process of quality and safety of the patient. In this way, it can be seen that nothing happens in a totally spontaneous way, but as a consequence of interventions, behaviors or decisions of multiple actors of the process that converge towards the future.

In the construction of the strategic planning oriented to accreditation, the understanding of information, as a gear of the operating system of hospital organizations, allows gains in quality, in smaller time spaces, since it makes possible the understanding of the norms and the reasons of the modifications in the processes, the motivation for engaging in change and the basis for the definition of indicators and for the discussion and evaluation of results.²⁶

In this sense, the projections are an indispensable tool to reach the objectives of standardization of the processes and homogenization of the language necessary for the success of a hospital organization in the process of accreditation. The challenges for the institutions participating in this study lie in the implementation of strategic measures in risk management for patient safety, thus increasing the quality of services provided in a multidisciplinary way.

Retrospective data analysis was limited to the study, in view of the possible underreporting of some events.

CONCLUSION

The Institution with the highest level of certification does not confirm the hypothesis

of having better results in the care indicators, however, it presents a constancy in its results demonstrating a more deeply rooted safety culture in the organization.

The most frequent indicator was medication error, which can be attributed to notification possibilities in several phases of the drug chain and by several professionals. The institutions studied demonstrated, as a strong point, the various actions taken to improve the performance of the indicators.

Another contribution of this research is related to the projected results, making it possible to evaluate, over time, whether the current level of certification is the result of adequate management and whether the current incidence of the indicator stems from practices that require continuity, dissemination and integration. With this, health managers / professionals will be able to draw up strategies in order to improve the quality of the assistance, promoting the evolution in the performance of the indicators.

Therefore, institutions need to work with indicators as positive components of care by measuring the quality of care delivery and identifying early patients who are at high risk for certain outcomes and enabling effectiveness in preventing them.

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