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Quality of Electronic Nursing Records

The Impact of Educational Interventions During a Hospital Accreditation Process

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Hospital accreditation is a strategy for the pursuit of quality of care and safety for patients and professionals. Targeted educational interventions could help support this process. This study aimed to evaluate the quality of electronic nursing records during the hospital accreditation process. A retrospective study comparing 112 nursing records during the hospital accreditation process was conducted. Educational interventions were implemented, and records were evaluated preintervention and postintervention. Mann-Whitney and χ^2 tests were used for data analysis. Results showed that there was a significant improvement in the nursing documentation quality postintervention. When comparing records preintervention and postintervention, results showed a statistically significant difference ($P < .001$) between the two periods. The comparison between items showed that most scores were significant. Findings indicated that educational interventions performed by nurses led to a positive change that improved nursing documentation and, consequently, better care practices.

KEY WORDS: Electronic health records, Hospital accreditation, Nursing audit, Nursing informatics, Quality of nursing care

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The model adopted for the hospital accreditation process, based on Joint Commission International (JCI) standards,[1] has been an important management tool. Through the implementation of requirements and standards, this process enables improvements in quality of care, continuous performance improvement, and facilitation of educational processes, as well as promoting internal collaboration between departments, processes, and team members.[2] To achieve the accreditation, several educational interventions are needed throughout the institution under review with the aim of compliance with JCI requirements. Nursing is one of the areas that needs to meet these requirements, specifically with nursing records, which is part of the electronic health record (EHR). To meet these requirements, there is a need to incorporate focused educational interventions, so that nursing documentation can be improved continuously.

BACKGROUND

The accreditation process based on JCI standards is recognized by many hospitals as a strategy for the pursuit of excellence in quality of care and safety for patients and professionals.[1,3] A systematic review of the literature[4] identified 26 studies that assessed the impact of the accreditation process on healthcare. Several of them showed that general accreditation programs were able to significantly improve clinical outcomes and had a significant positive impact on different hospital departments.

There is consistent evidence that shows that accreditation programs may improve the process of care provided by health services, which encourages the adoption of accreditation programs as a tool with the potential to improve the quality of health services.[4] Nurses are an integral part of healthcare systems and are critical for health service improvement. A previous study[5] analyzed the quality of nursing records before and after the implementation of systematic educational interventions. The results showed statistically significant improvement in nursing records after the intervention period.[5] The evaluation was performed using the quality of nursing

diagnoses, interventions, and outcomes (Q-DIO, Brazilian version),[6] an internationally validated instrument to evaluate nursing records. However, the authors found several limitations on the use of the Q-DIO to evaluate nursing records based on JCI standards, because the instrument did not cover all of the JCI criteria, and a more comprehensive tool is needed to have a better understanding of the impact of those educational interventions.

The JCI evaluation for hospital accreditation is based on standards divided into care and organizational sessions.[7] These sessions contained 14 items, and 10 of them relate directly to nursing records. For this study, nursing records are defined as documentation performed electronically by nurses through nursing assessments, diagnosis, intervention, and outcomes. The JCI items directly related to nursing records are international safety goals of the patient, access to care and its continuity, patient and family right, patient evaluation, patient care, anesthesia and surgery, patient and family education, medicine management, quality improvement, patient safety, and infection control and prevention. This study aimed to evaluate whether an educational intervention would improve the quality of nursing records during the hospital accreditation process. To achieve this aim, an instrument, based on the JCI standards, was built to evaluate nursing records before and after the intervention period.

METHODS

This was a retrospective study that included patients hospitalized between 2009 and 2013 in a public teaching institution in southern Brazil. The study was approved by the institutional ethics committee (number 130389). The sample consisted of 112 records selected from multiple inpatient units, which contained 52 records from clinical units and 60 records from surgical units. This sample size is of sufficient power for a 95% confidence level ($\alpha = .05$). Inclusion criteria were patients hospitalized for at least 4 days in clinical or surgical units. No exclusion criteria were applied. Data collection was carried out from EHRs through the health information service of the institution. The included records were randomly selected, and a proportionate number of records were pulled for each year.

Intervention

The intervention consisted of several educational actions performed by nurses during the hospital accreditation process with the aim of improving the quality of nursing records. The educational actions are listed on Table 1. Two services, the Nursing Education Service and the Nursing Process Committee, counted on 14 nurses, most with master's degrees, to carry out the education and training inside the institution, and they were responsible for delivering the intervention. In addition, there were evaluations of nursing records in the EHRs on specific topics (eg, pressure ulcer [PU], pain), which occurred systematically according to need. This need was identified through work groups and visits in the hospital units; when a need for improvement was identified, additional training was performed. These nurses spent approximately 300 hours per week on educational actions, including planning, implementation, and evaluation. The institution provided an open space for training, discussion, and clarification of specific employee questions and concerns. Although the institution benefited financially for being a public hospital connected to the federal government, employees did not receive any direct financial incentives for improving documentation. Moreover, employees reported no negative consequences related to the hospital's compliance with JCI requirements.

Table 1. Educational Actions Performed by Nurses During the Preparation Period for the Hospital Accreditation

Educational Actions
1. Focus groups
2. Systematic meetings with the support groups
3. Theoretical and practical training
4. Lectures for training
5. Clinical case studies
6. Active and educational visits to the inpatient units
7. Implementation of educational evaluations and the establishment of strategies to fix or alleviate problems encountered
8. Update of the EHR (specifically updating the nursing assessment tool with the addition of information related to patient and family's education and the inclusion of mandatory assessment items)
9. Development of brochures and manuals
10. Development and review of standard operating procedures
11. Development of an institutional acronyms list
12. Development of courses in a distance online education format
13. Printed and electronic informative folders
14. Availability of a specific space for training, dissemination, and clarification of concerns

Joint Commission International–Specific Quality Criteria

To evaluate the period before and after the interventions, a JCI–specific quality criteria (JCI-SQC) instrument was built. The instrument contained the quality criteria items provided by the JCI manual measurement elements. Items were measured on a 3-point scale as follows: 0, noncompliant; 1, partially compliant; and 2, compliant. The instrument contained the following items: presence of nursing assessment, falls prevention protocol, pain management protocol, PU prevention protocol, pain management, infection control, risk for fall education, lines of care evaluation (ie, patients with differing special needs), understanding of the education provided, patient transfer note, palliative care evaluation, standard

acronyms, frequency of nursing notes, and frequency of nursing orders. The JCI-SQC instrument and its operational definitions are available as Supplemental Digital Content 1 (see Supplemental Digital Content 1, http://links.lww.com/CIN/A37).

Data Analysis

The quality of the nursing records was analyzed for two periods: first, for the month before the hospital accreditation process, and second, for the month after the process. The accreditation process started in 2009 and went through on-site survey evaluation in November 2013; therefore, data were collected in October 2009 (before preparation) and October 2013 (after preparation). These evaluation periods will be referred to as the years 2009 and 2013, before and after the intervention period, respectively.

Because the instrument was developed specifically for this study, a pilot study was conducted with 24 records to estimate the interrater agreement in filling the instrument. Interrater reliability was evaluated using Cohen's κ statistics and intraclass correlation coefficient (ICC). Data analysis was performed comparing the total score and each of the JCI-SQC items between the preintervention and postintervention. For the comparison between continuous and asymmetrical variables, the Mann-Whitney test was used and results are presented as median (Md) and interquartile range (IQR). The comparison between categorical variables was performed using the χ^2 test and are presented as absolute numbers and percentiles, with adjusted standardized residuals. A level of statistical significance of 95% ($P < .05$) was adopted. Data were analyzed using IBM SPSS Statistics version 18.0 (IBM, Armonk, NY).

RESULTS

The pilot study was performed on 24 nursing records to verify the reliability of the instrument and demonstrated a high level of agreement. Cohen's κ and the ICC results showed a good to very good agreement for all items, with κ ranging from 0.81 to 1.00 and an ICC of $\alpha = 1.00$ ($P < .001$).

Table 2 shows results for the JCI-SQC instrument when applied to the entire sample and showed a statistically significant difference between the period preintervention and postintervention. Analysis of the total score revealed a significant difference between preintervention and postintervention, considering a minimum score of 0 and a maximum of 24 points. The total results for 112 records evaluated from 2009 showed Md of 9 (IQR, 7–10) and for 112 records evaluated from 2013 showed Md of 19 (IQR, 17–20), $P < .001$. The comparison between items, preintervention and postintervention, showed that most scores were significant. Nine of 12 variables (75%) showed a significant difference when comparing the year 2009 with 2013. The exceptions were found in the following items: evaluation in palliative care, standard acronyms, and frequency of nursing orders.

DISCUSSION

Study results showed that educational interventions would improve the quality of nursing records during the hospital accreditation process. Moreover, to our knowledge, this is the first study that developed an instrument that used measurement standards based on the JCI and demonstrated that it was a useful tool for JCI standards evaluation. The results of this study showed significant improvement in the quality of records postintervention. This suggests that the interventions applied in this study, especially those educational activities developed in the institution, did influence the quality and completeness of these records, suggesting better nursing care through the adoption of better care practices.

This study showed that there were no initial nursing assessments in 26.1% of the records preintervention and less than half of the preintervention sample had this assessment carried out within the first 24 hours after admission. During the postintervention period, 77.7% of the records were compliant and only two records did not contain any nursing assessment within the first 24 hours after admission, which meets the JCI standards recommendation.[7] A similar study[8] evaluated 253 nursing records and found that 65.6% were performed by assistant nurses and only 5.1% by RNs. Our study results indicate that a culture of attention for the initial assessment was established during the accreditation process. In addition, nursing education was associated with an improvement in electronic health records, showing a positive increase in the quality of nursing records and, consequently, better care practices.

The daily rate of nursing notes showed significant improvement between the preintervention and postintervention periods. In 2009, 67.9% of the evaluated medical records were considered compliant while in 2013 this rate increased to 83.9%, close to full compliance. There was no documentation in six records during the preintervention period and just two during the postintervention period. Although these results did not show a statistically significant difference, there is clinical relevance, since the evaluated records showed that eight patients were hospitalized for at least 4 days without any nursing notes.

In this study, the 2009 records analysis showed poor documentation of PU evaluation, with 50.9% of records having no evaluation and 47.6% categorized as partially compliant. Records from 2013 showed 91.1% of the records as compliant, with documented skin evaluation and reevaluation, as well as nursing care orders for the risk or presence of PU. These findings suggest that it is possible to obtain significant improvement on the initial PU risk evaluation and systematic PU reevaluation during a patient's hospital stay. This

Table 2. Comparison of Scores of JCI Specific Quality Criteria Between the Years 2009 (Preintervention) and 2013 (Postintervention) (n = 224)

Item	Y (Total n)	Noncompliant, n (%)	Partially Compliant, n (%)	Compliant, n (%)	P
1. Presence of nursing assessment	2009 (224)	29 (26.1)	36 (32.4)	46 (41.4)	<.001
	2013 (224)	2 (1.8)	23 (20.5)	87 (77.7)	
2. Falls prevention protocol	2009 (224)	108 (96.4)	4 (3.6)	0 (0)	<.001
	2013 (224)	1 (.9)	12 (10.7)	99 (88.4)	
3. Pain management protocol	2009 (224)	70 (62.5)	39 (34.8)[a]	3 (2.7)	<.001
	2013 (224)	6 (5.4)	33 (29.5)[a]	73 (65.2)	
4. Pressure ulcer prevention protocol	2009 (224)	57 (50.9)	53 (47.3)	2 (1.8)	<.001
	2013 (224)	2 (1.8)	8 (7.1)	102 (91.1)	
5. Pain management, infection control, and risk for fall education	2009 (224)	107 (95.5)	5 (4.5)[a]	0 (0)	<.001
	2013 (224)	1 (.9)	10 (8.9)[a]	101 (90.2)	
6. Lines of care evaluation	2009 (48)	11 (22.9)	35 (72.9)	2 (4.2)	<.001
	2013 (59)	2 (3.4)	32 (54.2)	25 (42.4)	
7. Understanding of the education provided	2009 (224)	111 (99.1)	0 (0)	1 (.9)	<.001
	2013 (224)	1 (0.9)	9 (8.0)	102 (92.1)	
8. Patient transfer note	2009 (89)	20 (22.5)	42 (47.2)	27 (30.3)	<.001
	2013 (61)	1 (1.6)	7 (11.5)	53 (86.9)	
9. Palliative care evaluation	2009 (6)	0 (0)	6 (100)	0 (0)	.075
	2013 (8)	0 (0)	4 (50.0)	4 (50.0)	
10. Standard acronyms	2009 (224)	2 (1.8)[a]	42 (37.5)[a]	68 (60.7)[a]	.129
	2013 (224)	6 (5.4)[a]	31 (27.7)[a]	75 (67.0)[a]	
11. Frequency of nursing notes	2009 (224)	6 (5.4)[a]	30 (26.8)	76 (67.9)	.0164
	2013 (224)	2 (1.8)[a]	16 (14.3)	94 (83.9)	
12. Frequency of nursing orders	2009 (224)	1 (.9)[a]	5 (4.5)[a]	106 (94.6)[a]	.118
	2013 (224)	0 (0)[a]	1 (0.9)[a]	111 (99.1)[a]	

[a]No significant adjusted standardized residuals.

improvement is in accordance with the JCI recommendation that institutions should identify the associated risks with any procedures or care plan, such as the need to assess the risk for PU and for falls.[7]

Results showed that, in 2009, there was noncompliance regarding the risk for falls protocol because there was no established policy on falls prevention in the institution at that time. The JCI standard recommends an initial assessment of the risk for falls, additional reevaluations, presence of implemented prevention measures, and surveillance.[7] In 2013, the analysis showed 88.4% compliance with implementation of a risk for falls protocol. This significant improvement on implementation of a risk for falls protocol and evaluation could be the result of increased engagement by nurses in education about the risk for falls and their prevention.[9] The educational interventions included clinical case studies and active surveillance in the units to monitor falls as a quality indicator.

In this study, pain management, infection control, and risk for falls education were noncompliant with standards in 95.5% of the records included in 2009; however, in 2013, 90.2% of the records were found compliant. Improvement was also found in documenting patient understanding of education. In 2009, just 0.9% of the records documented this item, which improved to 92.1% in 2013. Although there was a significant improvement in records regarding this item across all classes of patients, a greater number of the records included from 2009 and 2013 were classified as partially compliant, suggesting that there is still a need for educational activities in this area. There were 48 medical records in 2009 that had at least one of the lines of care, but only two contained documentation on patient education, and just 35 records mentioned the special needs of patients. On the other hand, in 2013, of the 59 records with an education need in at least one of the lines of care, 25 had identified a need and patients were educated on some aspect of their needs; however, not all had proper educational activities documented.

Findings showed a significant improvement of inpatient transfer notes between the years 2009 and 2013. Of the 89 patients in 2009, only 30% had records about the reason for transfer in the nursing notes. In 2013, 61 of the patients transferred (86.9%) had the reason documented. The most important result was that, of the records showing a transfer during hospitalization, there were 20 patients with no documentation in 2009 and just one in 2013. A study conducted in another hospital revealed a lower score (approximately 50%) in the evaluation of patient transfer

notes. This could be because of miscommunication between teams from different departments of the institution, suggesting that further investigation is needed.[10]

To better support communication in this study and meet JCI standards, the use of a standardized acronyms list was implemented in 2013 to improve care quality and safety. Even so, there was no significant improvement in the compliance between the preintervention and postintervention period, with still low rate of compliance in the categories "partially compliant" and "compliant" present during the two periods. This is in accordance with a study[11] that pointed to the inappropriate use of acronyms and abbreviations in healthcare, as well as the need for institutional standardization to avoid different interpretations, questions, and nonsecure communication.

Regarding palliative care, during the 2009 period, only six patients required palliative care. In those cases, assessment of symptoms was documented but without proper reassessment. In 2013, eight patients were under palliative care and four records contained both assessment and reassessment of symptoms; however, this improvement did not result in a statistically significant difference between the two periods. Another study identified underreporting of symptoms that directly affect cancer patients, thus hindering adequate management through effective interventions.[12] The JCI requires that assessments and reassessments be applied in a systematic way to identify symptoms and propose preventive and therapeutic approaches to care management, facilitating patient care.[1]

The frequency of daily nursing orders did not show significant improvement, but presented satisfactory scores in 2009 and in 2013 with compliance of 94.6% and 99.1%, respectively, of the evaluated records. However, this result showed better compliance rates than previous studies where there were lower rates in the development of care plans individualized to patient needs.[13]

A limitation of this study is that the educational activities implemented during the hospital accreditation cannot be independently shown to be the cause of the documentation improvement, and future studies should examine the association more thoroughly. For example, other variables may have played an important role in documentation improvement, for which this study was not able to control. Some other limitations of this study are that the instrument designed to evaluate the specific JCI criteria was only partially validated and that these results are limited to adult inpatient units. Further studies should consider instrument validation and applicability to other units.

CONCLUSION

This study aimed to evaluate whether an educational intervention improves the quality of electronic nursing records and showed that educational interventions have an impact on the quality of nursing records during the hospital accreditation process. Findings of this study showed a significant improvement in nursing records according to the JCI standards after educational interventions were applied during the hospital accreditation period. Most improvements were observed on falls prevention protocol, pain management protocol, PU, and understanding of the education provided. This supports the importance of nursing continuing education for improving the EHR system, the adoption of better care practices, and consequently, suggesting improved care delivery. Thus, the adoption of educational strategies to engage nurses to appreciate the importance of documentation in health records enabled a positive change in documentation quality and helped the institution to receive the JCI seal of quality in 2013. Finally, this educational strategy can be incorporated in other health institutions as a tool to improve practice, continuously improve nursing records, and ultimately, improve quality of nursing care.

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