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Original Article

Effect of an educational program on the quality of Nursing Process recording

Efeito do programa educativo na qualidade do registro do Processo de Enfermagem

Efecto de programas educativos en la calidad del registro del proceso de enfermería

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Keywords
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Descritores
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Descriptores
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Abstract
Objective: To verify the effect of an educational program on the quality of nursing process recording.
Method: Quasi-experimental study comparing the quality of records in medical charts according to the version adapted for use in Brazil of the instrument Quality of Nursing Diagnoses, Interventions and Outcomes. The instrument was applied before and after four educational meetings with nurses of the clinic units of a hospital, conducted between 2015 and 2016. The intervention was based on the use of an instrument with standardized language systems for diagnoses, interventions and outcomes, discussed based on real clinical situations. The data were organized and analyzed using the software Statistical Package for Social Science (SPSS), version 20.0, considering as significant $p<0.05$.
Results: The mean total score regarding the quality of nursing records presented significant improvement ($p = 0.003$), and the dimensions "Nursing Diagnoses as Process", "Nursing Diagnoses as Product" and "Nursing Outcomes" presented improvement, but their scores remained low.
Conclusion: The intervention was effective in improving the quality of nursing records, proving the need for educational programs for the implementation of standardized language systems in hospital practice, which should guide the diagnostic reasoning and the decision-making process of nurses.

Resumo
Objetivo: Verificar o efeito de um programa educativo na qualidade dos registros do processo de enfermagem.
Métodos: Estudo quase-experimental, que comparou a qualidade de registros nos prontuários considerando a versão adaptada para uso no Brasil do *Quality of Nursing Diagnoses, Interventions and Outcomes* antes e após quatro encontros educativos realizados com enfermeiros de unidades de clínica médica de um hospital de grande porte, entre 2015 e 2016. A intervenção teve como base o uso de um instrumento com sistemas de linguagens padronizadas de diagnósticos, intervenções e resultados, discutido a partir de situações clínicas reais. Os dados foram organizados e analisados com auxílio do *software Statistical Package for Social Science* (SPSS), versão 20.0, considerando significativo $p< 0,05$.
Resultados: A média do escore total da qualidade dos registros de enfermagem melhorou significativamente ($p=0,003$), e as dimensões "Diagnóstico de Enfermagem como Processo", "Diagnóstico de Enfermagem como Produto" e "Resultados de Enfermagem de Enfermagem", melhoraram suas médias, apesar de permanecerem baixas.
Conclusão: A intervenção foi efetiva na melhora da qualidade dos registros de enfermeiros, comprovando a necessidade de programas educativos para implementação de sistemas de linguagens padronizadas na prática hospitalar, que direcionem o raciocínio diagnóstico e a tomada de decisões por enfermeiros.

Resumen
Objetivo: Verificar el efecto de un programa educativo en la calidad de los registros del proceso de enfermería.
Métodos: Estudio cuasi experimental, que comparó la calidad de los registros en las historias clínicas considerando la versión adaptada para Brasil del *Quality of Nursing Diagnoses, Interventions and Outcomes* antes y después de cuatro encuentros educativos realizados con enfermeros de unidades de clínica médica de un hospital grande, entre 2015 y 2016. La intervención se basó en el uso de un instrumento con sistemas de lenguajes estandarizados de diagnósticos, intervenciones y resultados, discutido a partir de situaciones clínicas reales. Los datos se organizaron y analizaron mediante el uso del programa *Statistical Package for Social Science* (SPSS), versión 20.0, considerando significativo $p< 0,05$.
Resultados: El promedio de la puntuación total de la calidad de los registros de enfermería mejoró considerablemente ($p=0,003$) y las dimensiones "Diagnóstico de enfermería como proceso", "Diagnóstico de enfermería como producto" y "Resultados de enfermería" mejoraron su puntuación, a pesar de continuar bajas.
Conclusión: La intervención fue efectiva para mejorar la calidad de los registros de enfermeros, lo que comprueba la necesidad de programas educativos para la implementación de sistemas de lenguajes estandarizados en la práctica hospitalaria que orienten el raciocinio de diagnóstico y la toma de decisiones de los enfermeros.

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Introduction

The Nursing Process represents the systematic organization of nursing care and consists of Nursing Diagnoses, Outcomes and Interventions.[1] Its implementation is ensured by the Federal Nursing Council (COFEN) resolutions 358/2009 and 429/2012.[2,3]

Standardized language systems are important tools for registering the Nursing Process, since they guarantee documentation, communication between professionals and the use of electronic medical records. Standardized language systems are understood as a structure that organizes terminologies agreed upon in order to describe Nursing Diagnoses, Interventions and Outcomes.[4,5] The use of the Nursing Process with standardized language systems requires nurses to have professional experience and scientific basis for diagnostic reasoning and clinical decision making. The quality of Nursing Process recording can be compromised by the absence of critical thinking skills. In this context, previous studies have discussed the quality of records of the Nursing Process.[6,7]

A study evaluated through an audit the quality of the nursing records in 424 patient charts of a university hospital. Of these, 26.7% were considered bad; 64.6% were regular and 8.7% were good. The authors emphasize the need for a commitment with safety and for a perspective of patient care. They also highlighted the difficulty to measure the nursing care outcomes resulting from the practice of the nursing team.[6]

Another study analyzed 124 nursing records in the charts of patients hospitalized in the adult intensive care unit and who were later referred to the medical or surgical unit. The data indicate unsystematic notes, which compromise the functionality and the utility of the record as an instrument for communication and quality of care.[7]

Educational programs aimed at training nurses and improving the quality of records have been developed by educational institutions.[5,8-11] These programs present strategies for clinical reasoning, such as discussion of real clinical cases to promote critical thinking and the use of tools to evaluate quality. The *Quality of Nursing Diagnoses, Interventions and Outcomes* (Q-DIO) is a questionnaire developed and validated by researchers from Switzerland, the Netherlands and the United States,[5] and adapted and validated in Brazil.[12] Since then, studies have evaluated the effect of educational strategies in different settings in the Southern Brazil, Switzerland and the United States, highlighting the development of evidence on effective interventions to improve the quality of nursing records.

A randomized controlled trial, in which the intervention group participated in guided clinical reasoning and the control group in classic case discussions, showed that in the first group it was easier to develop critical thinking, elaborate diagnoses and interventions and reach interrelated results. There was a significant overall improvement in the quality of records in the intervention group, verified by the Q-DIO.[10]

A quasi-experimental study in the South Region of Brazil used the Q-DIO in two moments, baseline and after intervention, to evaluate the impact of an educational intervention on the quality of the records made by nurses from a cardiology intensive care unit. The educational intervention improved the quality of the nursing records. The study also evidenced the lack of quality of the records evaluated by their low mean values.[5]

There are publications[5,10] that have demonstrated the effect of educational programs on the quality of nursing records; however, studies on this subject are still scarce, and evidence that may impact clinical practice and patient care is still necessary. Thus, the question that guided this study was: What is the effect of an educational program on the use of standardized language systems for Nursing Process recording in a hospital in Niterói (RJ)?

The purpose of the present study was to evaluate the effect of the educational program Study Group on Nursing Records on the quality of nursing records. It is important to point out that it was the first educational strategy in this scenario using a tool based on the standardized language systems of the *North American Nursing Diagnosis Association*

International (NANDA-I), the interventions of the *Nursing Interventions Classification* (NIC) and outcomes of the *Nursing Outcomes Classification* (NOC).[13-15]

Method

Study design

Quasi-experimental, before and after study that evaluated the effect of an educational program called Study Group on Nursing Records.

Participants

All the nurses (female and male) working in two nursing clinics of a large hospital in Niterói (RJ), in the Southeast Region of Brazil, participated in the educational intervention, that is, in the Study Group on Nursing Records. At the time of the study, each clinic had 20 beds and a staff with 15 nurses, 12 who were on-call nurses and 3 who worked on a daily basis. All the nurses were invited to participate in the study and agreed, signing the Informed Consent Form.

The records from nurses who did not attend to 75% of the intervention or who were on vacation or on medical leave during the intervention period were excluded. However, by applying these criteria, no nurse was excluded.

The medical records of patients admitted in at least 24 hours and who remained hospitalized at least 4 days – a prerequisite for evaluation through the Q-DIO – were considered for the evaluation of the quality of nursing records.[16]

In this scenario, the nursing records are filled by hand on the evolution sheet, at each shift. There is a standardized form to register the care plan, which must be filled separately, every 24 hours. Standardized language systems are not used.

The time period for the data collection before and after the intervention was of one week. For the data collection, the researcher was trained by a nurse who had already participated in a study with the author who developed the Q-DIO and the author who validated the questionnaire for use in Brazil.[12,17]

Intervention – Study Group on Nursing Records

The intervention was developed with biweekly meetings with 2 hours, in December 2015 and January 2016. The nurses received an invitation for a meeting, in which the project was presented, the participants signed the Informed Consent Term and a schedule with dates and times of the four meetings was elaborated.

The intervention was carried out by three nurses who were researchers from the Study Group on Systematization of Nursing Assistance of the Fluminense Federal University, and were based on discussions of clinical situations from the daily practice of nurses in the sectors, using an instrument with standardized language systems for diagnoses (NANDA-I), interventions (NICs) and nursing outcomes (NOC).[13-15] In the first meeting of the Study Group on Nursing Records, a lecture on the Nursing Process was held. At the end of the meeting, a model of an instrument elaborated by researchers and nurses of the hospital's continuing education program was presented. The instrument was divided according to Gordon's Functional Health Pattern and was used to guide the data collection, offering didactic support for the determination of Diagnoses, Interventions and Outcomes.[18] Then, the nurses were divided in four groups (two from each ward) and were given the task of collecting data from one patient per group using the instrument.

In the two subsequent meetings, the concerns arising from the data collected and the search for knowledge in the literature were analyzed. The clinical situations were questioned in order to stimulate critical thinking, diagnostic reasoning and clinical decision-making, considering the diagnoses, outcomes and interventions.

In the last meeting, the nurses discussed one case study from each clinic and the aspects inherent to a good quality record. They also proposed actions for the continuity of the Study Group on Nursing Records.

Didactic material was provided to the participants of the Study Group on Nursing Records to clarify the lecture and also for later consultation.

The didactic material was composed of three scientific articles that addressed the theme. Books on standardized language systems were also made available during the meetings. The nurses had more than 75% attendance in all four meetings, thanks to the support of management and of the continuing education commission, and also to the previous scheduling of dates and times, without prejudice to any on-call nurse.

Outcome

The primary outcome was the quality of the nursing records, evaluated through the Q-DIO. Nursing records related to the anamnesis (admission record) available in medical charts were collected, and the evolutions of the 4 subsequent days were evaluated. In these, the records of Nursing Diagnoses, Interventions and Results were evaluated. In the post-intervention phase, all charts analyzed contained records of the nurses participating in the study.

To evaluate the quality of nursing records, the Brazilian version of the Q-DIO was applied, considering the Guidelines for the Application of Q-DIO.[16] The questionnaire consists of 29 items divided into four subscales. The items are evaluated on a three-point scale (zero corresponds to not documented, 1, partially documented, and 2, comprehensive documentation). The questionnaire has a minimum score of zero and a maximum of 58 points.

The first dimension of the Q-DIO, called "Nursing Diagnoses as Process", has 11 items and a maximum score of 22. In this subscale, the questions are related to anamnesis. The second dimension, "Nursing Diagnoses as Product", has eight items and a maximum score of 16, with questions about the diagnostic label itself. The third subscale, "Nursing Interventions", has three items and a maximum score of six. It addresses the interventions and their planning. The fourth subscale, "Nursing Outcomes", has seven items and a maximum score of 14. It evaluates the evolution records and evaluation of the goals and outcomes. In all subscales, the maximum score is 2 points.[12,18]

Sample size

Initially, a pilot study was conducted with the application of the Q-DIO in ten charts of the study scenario. The sample was calculated based on the standard deviation. The analysis for sample size estimation was performed with the *Programs for Epidemiologists for Windows* (PEPI-for-Windows), version 11.32. Considering a 90% power, a level of significance of 2.5 and a difference of 10 points, the study sample consisted of 14 charts for analysis before and after the intervention. The values considered a greater power and smaller margin of error with a larger sample.

Randomization

The records were randomized by the Statistical Package for Social Sciences (SPSS) for before and after the intervention, forming two groups of numbers chosen at random by the program.

Allocation

The medical charts that met the prerequisites for evaluation through the Q-DIO (4 days of hospitalization) were initially listed. Those considered eligible were arranged in a sequential list. Of the 40 records evaluated, 32 met the Q-DIO prerequisite in the pre-intervention period and 29 in the post-intervention period. Then, according to the randomized sequence, 14 charts were chosen randomly, respecting the sample number.[14]

Statistical methods

The data were organized and analyzed with the SPSS software version 20.0. Continuous variables were described by mean and standard deviation, or median and interquartile range, according to the homogeneous or heterogeneous behavior of the variable; the categorical variables were described with absolute and percentage frequencies. For the comparison between the pre- and post-intervention, the paired Student's t-test or the Wilcoxon test were used. $P<0.05$ was considered significant. The study was approved by the Research Ethics Committee protocol number 1.076.772 and CAAE: 44056015.3.0000.5243.

Results

Among the 15 participating nurses, age ranged from 30 to 64 years (mean: 37.8 ± 9.1), time of profession ranged from 8 to 32 years (mean: 16.3 ± 7.3), and the majority had a specialization (75%), followed by a master's degree (12.5%). Regarding previous contact (in teaching, research or work) with standardized language systems, only two participants used these systems in other locations. Only one participant attended a refresher course on Systematization of Nursing Care and two participants had contact with the theme in congresses. In the 12 months prior to the study, five participants attended refresher courses in various subjects, and three participated in congresses with varied themes.

The Q-DIO was used to evaluate a total of 14 medical records before the intervention and 14 medical records after the intervention. In the results presented in table 1, there is a comparison of the Q-DIO dimensions before and after the Study Group on Nursing Records. Except in the dimension "Nursing Interventions", there was a significant improvement in the scores after intervention.

Table 1. Comparison of the quality of nursing records using the instrument *Quality of Nursing Diagnoses, Interventions and Outcomes* (Q-DIO) before and after the intervention (n=14)

Dimensions of the Q-DIO (Brazilian version)	Pre-Intervention	Post-intervention	*p-value*
"Nursing Diagnoses as Process"*	1.0 (0-1.5)	6.0 (0-7.0)	0.012†
"Nursing Diagnoses as Product"*	2.0 (1.0-4.0)	7.0 (3.5-11.5)	0.006†
Nursing Interventions *	3.0 (3.0-3.0)	3.0 (3.0-3.0)	0.157†
Nursing Outcomes *	0 (0-1.5)	4.0 (0.5-6.0)	0.027†
Total score ‡	8.3±4.6	18.3±10.0	0.003§

*Median (interquartile range); † Wilcoxon test; ‡ mean ± standard deviation; § paired t-test

Table 2 presents the questions of each Q-DIO dimension, showing the values that increased and those that remained the same before and after the intervention. In "Nursing Diagnoses as Process", only items 2 and 3 presented a statistically significant increase. Items 14, 15, 16 and 17 of the dimension "Nursing Diagnoses as Product" had a statistically significant increase, as well as items 27 and 28 of the dimension "Nursing Outcomes". There was no change in the items of the dimension "Nursing Interventions".

Table 2. Questions of each dimension of the *Quality of Nursing Diagnoses, Interventions and Outcomes* (Q-DIO) before and after the intervention (n=14)

Items	Pre-intervention*	Post-intervention*	*p-value*†
"Nursing Diagnoses as Process"			
1. Actual situation leading to the hospitalization	0 (0-1)	1 (0-2)	0.62
2. Anxiety and worries related to hospitalization, expectations and desires about hospitalization	0 (0-0)	1 (0-2)	0.015
3. Social situation and living environment/ circumstances	0 (0-0)	0 (0-1)	0.038
4. Coping in the actual situation/with the illness	0 (0-0)	0 (0-1)	0.23
5. Beliefs and attitudes about life (related to the hospitalization)	0 (0-0)	0 (0-0)	0.317
6. Information of the patient and relatives/ significant others about the situation	0 (0-0)	0 (0-1)	0.84
7. Intimacy, being female/male	0 (0-0)	0 (0-0)	0.317
8. Hobbies, activities for leisure	0 (0-0)	0 (0-0)	1
9. Significant others (contact persons)	0 (0-0)	0 (0-0)	0.564
10. Activities of daily living	0 (0-0)	0 (0-0)	0.157
11. Relevant nursing priorities according to the assessment	0 (0-1)	0 (0-0)	0.059
"Nursing Diagnoses as Product"			
12. Nursing problem/nursing diagnosis label is documented	1 (0.5-1)	1 (0.5-2)	0.157
13. Nursing diagnosis label is formulated and numbered according to NANDA-International	1 (0-1)	1 (0.5-1)	0.157
14. The aetiology is documented	0 (0-1)	1 (0.5-1.5)	0.014
15. The aetiology is correct and corresponding to the Nursing Diagnosis	0 (0-0.5)	1 (0.5-2)	0.005
16. Signs and symptoms are formulated	0 (0-1)	1 (0.5-1.5)	0.004
17. Signs and symptoms are correctly related to the Nursing Diagnosis	0 (0-0.5)	1 (0.5-1)	0.005
18. The nursing goal relates/ corresponds to the Nursing Diagnosis	0 (0-0.5)	0 (0-1)	0.157
19. The nursing goal is achievable through nursing interventions	0 (0-1)	1 (0-1.5)	0.102
Nursing Interventions			
20. Concrete, clearly named Nursing Interventions according to NIC are planned	1 (1-1)	1 (1-1)	1
21. The Nursing Interventions effect the aetiology of the Nursing Diagnosis	1 (1-1)	1 (1-1)	1
22. Nursing Interventions carried out are documented	1 (1-1)	1 (1-1)	0.157
Nursing Outcomes			
23. Acute, changing diagnoses are assessed daily or from shift to shift	0 (0-0)	1 (0-1.0)	0.157
24. The Nursing Diagnosis is reformulated	0 (0-0)	0 (0-0)	0.655
25. The Nursing Outcome is documented	0 (0-0)	1 (0-1.0)	0.059
26. The Nursing Outcome is observably/ measurably documented according to NOC	0 (0-0)	0 (0-0)	0.05
27. The Nursing Outcome shows improvement	0 (0-0)	1 (0-1.0)	0.008
28. There is a relationship between Nursing Outcomes and Nursing Interventions	0 (0-0)	1 (0-1.0)	0.02
29. Nursing Outcomes and Nursing Diagnoses are internally related	0 (0-0)	1 (0-1.0)	0.059

*Median (interquartile range); † Wilcoxon test

Discussion

This study demonstrated that the educational program "study group" was effective in improving the quality of nursing records. Except for the dimension "Nursing Interventions", there was a significant improvement in the scores after the intervention when compared with the evaluation before the study group. However, the values continued to be low, even after the intervention.

The Q-DIO includes the dimension "Nursing Diagnoses as Process" (22 points), which addresses the complete documentation of the first step of the Nursing Process, that is, the anamnesis, which is the systematized guideline for data collection and the process that makes it possible to identify the Nursing Diagnosis.[19] Because it is the first step, the nurses identify data that are significant for the other steps of the process. In the absence of these data, the others may be incoherent and/or inconsistent to document the process.

The admission record was considered for the evaluation of these data. The score of this dimension showed a significant improvement in the median after the intervention (p=0.012); however, there is a lack of basic data of the anamnesis on the nursing records, which, in turn, has a direct impact on the quality and care provided by these professionals. This contradicts the Nursing Process concepts, considering that since the 1960s the nurses have been assigned the responsibility of collecting data to identify problems.[19] The minimum and indispensable data are identification data; perception and expectations; basic needs; physical examination; and communication patterns.[17] This step of the Nursing Process does not use standardized language systems and was not highlighted as a priority in the Study Group on Nursing Records or as a need for discussion during meetings.

A Brazilian study analyzed the quality of nursing records before and after hospital accreditation. Among the data evaluated, it was possible to identify that the dimension "Nursing Diagnoses as Product" did not present differences before and after intervention (p=0.002)[20]. However, in this study, all items showed improvement after the intervention (p=0.006).

The score referring to the dimension "Nursing Interventions" did not present any changes between the pre- and post-intervention periods. This is probably due to the prior implementation of a form in the study scenario, with a previously established care plan, which already enabled nurses to execute and record this phase of the process. Despite this, the nurses still did not establish a relationship between Nursing Diagnoses and Nursing Interventions. A study analyzed the nursing records done by nurses and showed that 88.4% presented the nursing prescription, but only 41.3% presented the Nursing Diagnoses,[11] which may be related to their adaptation to the systematized documentation of actions.

The dimension "Nursing Outcomes" (16 points) analyzes the documentation of re-evaluations of Nursing Diagnoses and Outcomes. The scores of this dimension improved after the intervention (p=0.027). When analyzing the items that did not show improvement, those related to the use of the NOC predominated.

The total score (58 points) is the sum of all the dimensions evaluated. In the present study, the mean score increased after the intervention; however, it remained below half of the Q-DIO's total score. Previous studies corroborate the results of the present study and also achieved positive results after educational interventions.[5,10]

A study conducted in the South Region of Brazil evaluated the impact of an educational intervention on the quality of the nursing records in the cardiology intensive care unit. The intervention was performed weekly, for 5 months. To evaluate the quality of the records, the Brazilian version of the Q-DIO was used in 30 medical records, before and after the educational intervention. The intervention had a positive effect on the quality of the records, and most of the items presented a significant increase; however, the authors emphasize the presence of low scores even after the intervention.[5] Only eight of the 29 questions of the Q-DIO did not present improvement after the intervention, reinforcing that the duration of the intervention can affect the improvement of results regarding the quality of records.

Another study carried out in the South Region of Brazil analyzed the quality of nursing records in 112 charts, comparing the results obtained before and after the preparation for hospital accreditation using the Brazilian version of the Q-DIO. A significant improvement in the quality of nursing records was observed in 24 of the 29 items (82.8%) of the questionnaire.[20] The institution maintains the study group as a continuous strategy to improve the quality of nursing records, the Nursing Process and standardized language systems in electronic medical records.

Two international studies using the Q-DIO have also demonstrated improvement in the quality of nursing records after educational interventions based on clinical reasoning.[10,21] The present study corroborates the results of these studies, since it showed considerable improvement in the quality of records after training in the Study Group on Nursing Records. The need for continuing educational programs and the search for the best strategy to impact each scenario can be highlighted.

Considering the importance of Nursing Process recording for patient documentation, communication between professionals about decisions based on clinical reasoning and promotion of quality care for patients, the results of this study are concerning. It is imperative to identify the implications of poor-quality Nursing Process recording, as well as its causal factors.

Poor-quality Nursing Records can be an indication of a serious problem, with direct impact on the quality of care and on patient safety and involving not only healthcare professionals, but also managers, class organizations, researchers and teachers. When implementing Nursing Process recording with standardized language systems in hospitals, the professionals involved must ensure that study groups with meetings for discussion of clinical cases, scientific articles, solution of clinical problems and decision-making are maintained and based on research with high methodological rigor.

As an intervention based on questioning, it did not have a traditional, rigorous and replicable teaching plan, making it difficult to elaborate protocols for future experimental studies.

Conclusion

The Study Group on Nursing Records was effective in improving the quality of the nursing records and, despite the low scores after the intervention, it allowed the construction and discussion of an instrument to record the Nursing Process with standardized language systems based on real clinical situations. It is presented as a feasible proposal to be used in hospital institutions in order to improve diagnostic reasoning and decision-making based on nursing outcomes and to support clinical practice. Randomized controlled trials with a variety of teaching-learning methodologies and larger samples should be conducted to evaluate the improvement of the quality of nursing records, reinforcing the importance of documentation to communicate patient outcomes.

Collaborations

Melo LS, Figueiredo LS, J Pereira MV, Flores PVP and A Cavalcanti CD contributed with the project design, article writing, critical review of intellectual content, data analysis and interpretation and final approval of the version to be published.

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