

## EFFECT OF A STANDARDIZED INSTRUMENT ON THE QUALITY OF NURSES' RECORDS: A QUASI-EXPERIMENTAL STUDY

### EFEITO DE UM INSTRUMENTO PADRONIZADO NA QUALIDADE DE REGISTROS DE ENFERMEIROS: ESTUDO QUASE-EXPERIMENTAL

### EFFECTO DE UN INSTRUMENTO ESTANDARIZADO EN LA CALIDAD DE LOS REGISTROS DE ENFERMERÍA: ESTUDIO CUASI EXPERIMENTAL

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## ABSTRACT

**Objective:** to evaluate the effect of the implementation of an instrument based on diagnostic standardized language systems, interventions and results on the quality of nurses' records. **Methods:** a quasi-experimental study that compared the quality of nurses' records through the Quality of Diagnosis, Interventions and Outcomes in medical records of patients hospitalized in cardiovascular units before and after the implementation of a standardized instrument. **Results:** there was a significant improvement in the quality of records after the use of the instrument in the "diagnosis as a process" ( $p=0.018$ ), "diagnosis as a product" ( $p=0.019$ ) and "Nursing outcomes" ( $p<0.001$ ) dimensions. The "Nursing intervention" dimension showed no statistically significant difference, but obtained an increase in the score at post-intervention time. Despite the improvement in the quality of the records, the mean of the total score remained low after implementation of the instrument ( $14.8\pm5.7$  vs.  $29.0\pm10.5$ ;  $p=0.003$ ). **Conclusion:** the use of an instrument based on diagnosis standardized language systems, interventions and results has improved the quality of nurses' records in cardiovascular units and should be considered an important tool for improving the documentation on patient records.

**Keywords:** Nursing Process; Nursing Diagnosis; Nursing Records; Cardiovascular Diseases.

## RESUMO

**Objetivo:** avaliar o efeito da implementação de um instrumento pautado nos sistemas de linguagens padronizadas de diagnósticos, intervenções e resultados na qualidade dos registros de enfermeiros. **Métodos:** estudo quase-experimental que comparou a qualidade dos registros de enfermeiros por meio do Quality of Diagnosis, Interventions and Outcomes em prontuários de pacientes hospitalizados em unidades cardiovasculares antes e após a implementação de um instrumento padronizado. **Resultados:** houve significativa melhora na qualidade dos registros após a utilização do instrumento nas dimensões "diagnóstico como processo" ( $p=0,018$ ), "diagnóstico como produto" ( $p=0,019$ ) e "resultados de Enfermagem" ( $p<0,001$ ). A dimensão "intervenção de Enfermagem" não apresentou diferença estatística significativa, mas obteve aumento do escore no momento pós-intervenção. Apesar da melhora da qualidade do registro, a média do escore total se manteve baixa após a implementação do instrumento ( $14,8\pm5,7$  vs.  $29,0\pm10,5$ ;  $p=0,003$ ). **Conclusão:** o uso de instrumento pautado em sistemas de linguagens padronizadas de diagnósticos, intervenções e resultados melhorou a qualidade dos registros de enfermeiros em unidades cardiovasculares e deve ser considerado uma importante ferramenta para melhora da documentação em prontuários de pacientes.

**Palavras-chave:** Processos de Enfermagem; Diagnósticos de Enfermagem; Registros de Enfermagem; Doenças Cardiovasculares.

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## RESUMEN

**Objetivo:** evaluar el efecto de la implementación de un instrumento basado en los sistemas de lenguajes estandarizados de diagnósticos, intervenciones y resultados en la calidad de los registros de enfermería. **Métodos:** estudio cuasi experimental que compara la calidad de los registros de los enfermeros a través del Quality of Diagnosis, Interventions and Outcomes (calidad del diagnóstico, intervenciones y resultados) en los registros médicos de pacientes hospitalizados en unidades cardiovasculares, antes y después de la implementación de un instrumento estandarizado. **Resultados:** se observó mejora significativa en la calidad de los registros después del uso del instrumento en las dimensiones "diagnóstico como proceso" ( $p = 0,018$ ), "diagnóstico como producto" ( $p = 0,019$ ) y "resultados de enfermería" ( $p < 0,001$ ). La dimensión "intervención de enfermería" no mostró diferencias estadísticamente significativas, pero obtuvo un aumento en la puntuación después de la intervención. A pesar de la mejora en la calidad del registro, la puntuación total media se mantuvo baja después de la implementación del instrumento ( $14,8 \pm 5,7$  vs.  $29,0 \pm 10,5$ ;  $p = 0,003$ ). **Conclusión:** el uso de un instrumento basado en sistemas de lenguajes estandarizados de diagnósticos, intervenciones y resultados ha mejorado la calidad de los registros de enfermería en unidades cardiovasculares y debe considerarse como una herramienta importante para mejorar la documentación en los registros de pacientes. **Palabras clave:** Proceso de Enfermería; Diagnóstico de Enfermería; Registros de Enfermería; Enfermedades Cardiovasculares.

## INTRODUCTION

The nurses' record is important for the planning, implementation and the Nursing process assessment. This ensures patient's safety and continuity of care.<sup>1-4</sup> Legally, it is supported by *Conselho Federal de Enfermagem* – COFEN Resolution N° 429/2012, which attributes to nurses the responsibility and duty to record in the patient's medical record the information inherent to the care process and the management of work processes, necessary to ensure the continuity and quality of care.<sup>5</sup>

In the last four decades, researchers have improved the standardized language systems (SLSs) of Nursing diagnoses, interventions and outcomes, in an attempt to make the Nursing process elements understandable and measurable.

The knowledge obtained made it possible to classify and facilitate access to information, represent concepts, control different meanings and favor communication among specialists.<sup>2</sup> It has also improved diagnostic reasoning and decision-making by nurses around the world.<sup>4-7</sup>

The 21<sup>st</sup> century requires the development of electronic patient records (EPRs) and the use of SLSs to improve the reliability, validity, and usability of Nursing documentation, allowing for the consistent use of Nursing care data to assess the care and to report clinical, managerial and political decisions.<sup>8</sup>

Despite this, many institutions present difficulties inherent to the implementation of records with the Nursing process, using diagnoses, interventions, and results with SLSs in the care practice.

Studies have shown the difficulties encountered by nurses and Nursing students to register on patient records, and this is considered a serious problem to be solved to ensure the patients' documentation and quality of care.<sup>6,9</sup> A cross-sectional study conducted in Paraná analyzed 114 patient records and found that 90.35% of the records did not contain information on therapeutic measures conducted by team members.<sup>6</sup>

Another study conducted in two Pernambuco's institutions with 60 Nursing students from the last undergraduate term identified Nursing interventions of the Nursing Intervention Classification (NIC) from the Nursing Diagnosis of NANDA – International (NANDA-I) and their association with Nursing outcomes. The results revealed that 69% of the students did not develop interventions and that 58% presented expected results according to the Nursing Outcomes Classification (NOC).<sup>9</sup>

The researchers seek educational strategies that can improve the quality of nurses' records and improve care practice based on scientific evidence and critical thinking.<sup>2,10,11</sup>

## OBJECTIVE

To evaluate the effect of the implementation of an instrument based on diagnosis standardized language systems, interventions and results on the quality of nurses' records.

## METHOD

### STUDY DESIGN

This is a quasi-experimental study to evaluate the quality of nurses' records before and after training and implementation of a standardized instrument for recording in cardiovascular units.

### PARTICIPANTS

The research was carried out in the cardiovascular units: cardiology ward, cardio-intensive unit and cardiac intensive care center of a state university hospital located in *Rio de Janeiro*, Brazil.

Five nurses participated in the study after signing the Free and Informed Consent Form (FICF); three of them from the cardio-intensive unit, one from the cardiology ward and one from the cardiac intensive care center.

The study included the nurses' records on medical charts of patients hospitalized in cardiovascular units for at least four ndays, regardless of whether or not they used SLSs, a prerequisite for quality assessment by means of the Q-DIO.<sup>12</sup>

The following nurses' records were excluded: those assessed as illegible by the researcher, coming from medical records filed outside the research center, as well as from nurses who were away on medical leave or vacation and from

residents with expected sector change during the training. There was a sample loss of one nurse due to medical leave during the intervention.

In the institution where the research was carried out, the Nursing records of the cardiac ICU and cardio-intensive unit are performed in a handwritten manner in their own printed forms, specifically directed to critically ill patients. There is also a list of NANDA-I Nursing diagnoses and a care plan in a checklist format but without an SLS basis. In the Nursing wards, the records are made directly on progress sheets every 12 hours of duty, without a standardized care plan form. Besides, there is no use of SLS at any stage of the Nursing processes.

## INTERVENTION

The training with the nurses took place in November 2015 and discussed the implementation of an instrument for the nurses' records in cardiovascular units, based on the SLSs of NANDA-I, NIC and NOC and was lectured by a researcher and three members of the Nursing Care Systematization Study Group (*Grupo de Estudos de Sistematização em Assistência de Enfermagem*, GESAE\_UFF). There were two meetings lasting seven hours.

Initially, a lecturing class on SLSs was held directed to patients with cardiovascular disorders. Subsequently, each part of the proposed instrument was discussed so that everyone could understand its completion.

The standardized instrument for nurses' recording in cardiovascular units was developed from the results of a previous study and was divided into three main parts (study review)<sup>13</sup>: a) Nursing history and physical examination, with filling in of subjective and objective data; b) Nursing diagnoses and Nursing outcomes; c) Nursing interventions. Its use enables nurses to relate the Nursing process stages using standardized language systems (SLSs) and to record the entire process in a systematic and detailed manner in the medical chart.

The first part, the Nursing history, is composed of items related to patient identification, vital signs, and anthropometric data, previous history, history of the current disease, family history, and detailed data collection, oriented according to the 12 domains of NANDA-I and physical examination.

In the second part the main Nursing diagnoses are listed according to NANDA-I, with defining characteristics and related factors, according to a previous study, as well as the respective Nursing outcomes according to NOC, so that it is possible to visualize the results through a time curve, generated by each evaluation of proposed/expected results.

The third part is composed of Nursing interventions suggested by the NIC for each Nursing diagnosis, presenting as a list of possible interventions related to the diagnoses found

in the second part of the instrument. Only after clarifying all doubt, the instrument was used by the units' nurses.

## SAMPLE CALCULATION

A pilot study was developed with the application of Q-DIO in 10 medical charts of patients hospitalized in cardiovascular units, randomly chosen in each unit, two in the cardiology ward, six in the cardio-intensive unit, and two in the cardiac intensive care unit. The medical charts used in the pilot study were not included in the study.

In the analysis to estimate the sample size, using the WINPEPI v11.32 program, considering a standard deviation of 7.5, a power of 80%, a significance level of 1%, a difference of 10 points, and a correlation coefficient of 0.3, a sample was obtained of 12 records before and after the training, totaling 24 record evaluations.

## MEASURING INSTRUMENT

The Q-DIO is an instrument used to measure the quality of Nursing records and can be used to compare records based or not on standardized language, evaluation of the effect of educational programs and/or audit systems on the Nursing care quality evaluation.<sup>2</sup> This instrument was developed in 2008 by Switzerland researchers and validated for use in Brazil and in the United States.<sup>11,12</sup>

It is composed of 29 items divided into four dimensions: a) Nursing diagnoses as a process; b) Nursing diagnoses as a product; c) Nursing interventions; d) Nursing outcomes.

In the version validated in Brazil, the items are classified on a three-point Likert-type scale, namely: zero "undocumented", one "partially documented", and two "complete documentation". Assuming that each of the 29 items receives a maximum score of two points, the highest possible score on the Q-DIO is 58 points. The psychometric analysis of Q-DIO has internal consistency (Cronbach's alpha higher than 0.70).<sup>11,12</sup>

## DATA COLLECTION AND ANALYSIS

The records eligible for the study were listed sequentially and, from this list, 12 were randomly selected. To avoid bias in the filling of the Q-DIO instrument, data collection was performed by the same researcher, who was previously trained by another researcher who used the Brazilian version of Q-DIO and was trained by the author who validated the questionnaire for use in Brazil.

Data collection occurred between November 2015 and February 2016, before and after the training of nurses, with the evaluation of diagnosis records, interventions, prescriptions (care measures) and Nursing outcomes in at least four subsequent daily evolutions of the same patient.

## DATA ANALYSIS

The data were organized and analyzed with the help of SPSS 20.0. The continuous variables were described by mean and standard deviation or median and interquartile interval (results of Q-DIO subscales' scores and the total Q-DIO score). The categorical variables were described with absolute and percentage frequencies (characteristics of the nurses based on the sample characterization instrument regarding professional experience, whether or not they participated in any previous training).

The data from Q-DIO were presented based on a total score of 58. The Q-DIO scores obtained before training were compared with the scores after training by paired Student's t-test (or Wilcoxon test for non-parametric variables). The p-value < 0.05 was considered significant.

## ETHICAL ASPECTS

The study met the standards of ethics in research involving human beings, with approval by the Ethics Committee of the Medical School of the Antônio Pedro University Hospital (Nº 1,220,282).

## RESULTS

The five nurses participating in the study were aged between 23 and 31 years old, with less than five years of care practice, completed graduate studies and previous experience in working with the SLS from *NANDA-International*.

Table 1 shows the Q-DIO domains in the moments before and after the training. Except for the "Nursing interventions" domain, the others obtained a statistically significant difference, all with an increased score in the post-intervention moment. The total Q-DIO score stands out ( $14.8 \pm 5.7$  vs.  $29.0 \pm 10.5$ ;  $p=0.003$ ), whose mean also increased in the post-intervention moment. We can see that the add means of Q-DIO were low at both moments.

Table 1 - Nursing records quality comparison by the use of the Q-DIO instrument in the pre- and post-intervention moments (n=12). Niterói, 2015

Q-DIO domains (Brazilian version)	Pre-intervention moment	Post-intervention moment	p-value
Nursing Diagnosis as a process	2.0 (2.0-5.0)	7.0 (3.5-15.0)	0.018*
Nursing Diagnosis as a product	5.0 (3.5-7.0)	11.5 (8.0-13.5)	0.019*
Nursing interventions	1.5 (2.0-3.0)	1.5 (0.5-3.0)	0.105*
Nursing outcomes	$3.2 \pm 2.3$	$8.0 \pm 2.2$	$p < 0.001$
Total score	$14.8 \pm 5.7$	$29.0 \pm 10.5$	0.003

\*Wilcoxon test (non-parametric); Q-DIO – Quality of Diagnosis, Interventions and Outcomes.

## DISCUSSION

This study proved that the implementation of a Nursing SLS-based instrument in cardiovascular units after the training of nurses significantly increased the total score of the quality of Nursing records from the Q-DIO. Considering each dimension separately, it was verified that only "Nursing interventions" did not show any significant improvement when compared to the moment after the implementation of the instrument. The low means obtained at both moments are noteworthy.

The "Nursing diagnosis as a process" dimension is linked to the understanding of the Nursing phenomena and of the patients' needs, their problems and resources. It is usually investigated at patient admission, based on a complete anamnesis and physical examination.<sup>11,12</sup>

Although the score of this domain has improved in this study at the post-intervention moment ( $p=0.018$ ), it is notable that it still represents less than half the value of the instrument's recommended score. Therefore, the recording of these phenomena is incomplete, which can be attributed to the patient's profile and data collection scenarios, since two units are of intensive care. One of them is directed to surgical patients, admitted in the immediate post-operative period. The other, with the profile of severely ill patients in the use of invasive mechanical ventilation, under sedation and comatose, mostly. Therefore, the patient's verbal and non-verbal communication was not effective, hindering the collection of data on religion, leisure, sexual need, and perspectives and expectations about hospitalization and treatment, thus making it impossible to completely record the items analyzed in this Q-DIO domain.

Another Brazilian study that evaluated the Nursing records of 253 medical charts of a teaching hospital pointed out that data related to the interview (50.6%) and physical examination (95.3%) were incomplete.<sup>14</sup> This data corroborates the results of this research and highlights the need for more attention to the data collection recording (Nursing history) since this represents the Nursing process basis. Before the interview and physical examination, the patient's abnormal responses are identified, which indicate the beginning of the diagnostic reasoning and decision making for the desired results and planned interventions.

The "Nursing diagnosis as a product" dimension is related to the judgment of Nursing diagnoses and whether or not they were elaborated in a detailed manner.<sup>11,12</sup> To this end, we considered whether the Nursing diagnosis causes (related factors) and the signs and symptoms (defining characteristics) were described. The score for this domain improved significantly after the training of nurses and the implementation of the instrument ( $p=0.019$ ). However, it reached a moderate value when compared to the total number of points to be obtained in this domain.

An international study evaluated the reasons that influenced nurses in the determination of Nursing diagnoses

in their records and obtained factors such as: little knowledge about Nursing diagnosis and clinical reasoning, number of patients per nurse, accumulation of administrative activities, work overload, institution with medical model, patients with several comorbidities and cultural differences and absence of electronic medical records.<sup>15</sup>

Reinforcing the results of this research, a Brazilian research that analyzed nurses' records in 240 medical charts found that 54.2% of the records were completely filled for the Nursing diagnosis; however, 58.7% of these were not related to Nursing developments or Nursing prescriptions (64.6%).<sup>16</sup>

Regarding the lack of improvement in the "Nursing interventions" domain, it is believed that the scores obtained at the moment before the training were already positive since the units used a standardized instrument with Nursing interventions. Therefore, the implementation of the SLS-based instrument did not interfere in the quality of the records in this domain.

A study conducted in Switzerland also showed an improvement in the mean at the post-intervention moment in relation to the pre-intervention and control group. For this domain, the mean score of the intervention group was 1.53 (SD = 1.08) compared to 3.77 (SD = 0.53,  $p < 0.0001$ ) in the post-intervention period.<sup>17</sup>

The "Nursing outcomes" domain analyzes the record of Nursing diagnosis reassessments and related Nursing outcomes, measured by scales according to the NOC (Q-DIO reference). The increase in the score after the implementation of the instrument is noticeable.<sup>18</sup> Despite the increase in the number of publications on Nursing outcomes in Brazil and worldwide, there are still few institutions that use it in the practice. Faced with that, nurses who went through training for the implementation of the instrument with the registration of patient outcomes centered on diagnoses and interventions showed an improvement in quality compared to the use of the standardized instrument ( $p < 0.001$ ).

Although the total Q-DIO score after training and implementation of the standardized instrument showed a significant improvement ( $14.8 \pm 5.7$  vs  $29.0 \pm 10.5$ ) in the quality of nurses' records ( $p = 0.003$ ), it is still considered low when compared to the total score of the Q-DIO scale, which is 58 points.

A multi-center study, with a quantitative approach, which analyzed 138 nurses' records of two Brazilian institutions by means of the Q-DIO showed significant results regarding the score attributed to the "Nursing diagnosis as process and product" domains in the two centers, but obtained a total score of 35.46 in center 1, which stood out when compared to center 2.<sup>19</sup>

The data from a multi-center study converge with the present study, not reaching the maximum score and presenting low quality of nurses' records by the Q-DIO evaluation.<sup>2</sup> Nurses, professors, and researchers of Nursing in Brazil have recognized that there is a

gap between the Nursing record taught at the academy and the way it is implemented after professional training.<sup>2,20</sup>

Authors who analyzed the quality of Nursing documentation comparing the periods before and after preparation for hospital accreditation using the Q-DIO version found a significant difference between the two assessments; the median and interquartile range increased from 31 (28-37) to 43 (37-47).<sup>20</sup> These data reassert the data from this study, which showed progress in the evaluations before and after the implementation of the standardized-instrument.

Another study demonstrated the impact of an educational intervention on the quality of Nursing records, with a significant increase in the mean values after the intervention, despite the items' low mean for both moments.<sup>2</sup>

Several research studies have shown that educational interventions and strategies such as the present study improve the quality of Nursing records but that, even with specific interventions for the Nursing process and the use of SLSs, the total score's means remain low. In light of this, efforts by managers, councils, associations, research groups, educators and researchers have been made to improve the quality of records and thus patient safety and service quality. The search for strategies to improve teaching and motivate nurses to improve the quality of records has been the focus of these scholars.

One example was the international longitudinal study with 111 Nursing records analyzed by the Q-DIO in three different groups. The first, with training containing conventional case studies on the use of Nursing diagnoses and their recording by nurses; the second, with a training program called Guided Clinical Reasoning; and the third with an electronic Nursing documentation program, in which Nursing diagnosis was suggested by the program according to data entered by nurses. The results and conclusion of the study demonstrated that the electronic documentation system could not replace the ability to think critically and reflect on the clinical situation. Group 2, trained to think critically, was the one that got the best results.<sup>17</sup>

The experience in the training of nurses carried out in this study for the implementation of the SLS-based instrument highlighted the need for institutional support for motivation and continuing education of the practice's professionals. The search for alternatives that adapt to each scenario should be a concern for all those involved in the process of improving the quality of the provided care.

This study was limited by the impossibility of comparison with a control group, due to the insufficient number of nurses in the tested units so we could divide them into two groups. Besides, the training was not performed by all nurses, due to the impossibility of participation of those who were on medical leave and vacation. Therefore, data generalization is not possible.

## CONCLUSION

The implementation of an instrument based on diagnosis SLPs (NANDA-I), interventions (NIC) and outcomes (NOC) directed to the cardiovascular area improved the quality of Nursing records, which highlights the effect of the proposed intervention on patients' documentation, providing data for research and ensuring improvement in the clinical evaluation performed by nurses in decision making, Nursing care planning, and Nursing outcomes.

It is recommended to develop studies on the implementation of strategies using SLSS assessed by the Q-DIO in other scenarios for more data generalization.

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