

NURSING CARE QUALITY IN PERIPHERAL INTRAVENOUS THERAPY: ANALYSIS BY INDICATORS

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ABSTRACT: This Longitudinal study, with an observational and quantitative approach, aimed to analyze the quality of nursing care in peripheral intravenous therapy, through the indicators, incidence of phlebitis, quality of coverage, and validity of the peripheral intravenous catheters. Data were collected from October 2012 to August 2013, in three units of a teaching hospital in the state of Paraná, Brazil, using a form created for this purpose. A total of 174 patients and 221 catheters were evaluated. The results indicated an incidence of phlebitis between 20% and 25.33%; identification and the validity of the venous accesses were classified as safe and adequate in the majority of cases, according to an analysis of the Positivity Index that classifies medical work. It was concluded that the evaluated indicators could mostly be interpreted as favorable for care quality.

KEYWORDS: Nursing; Quality of health care; Phlebitis; Peripheral catheterization.

QUALIDADE DA ASSISTÊNCIA DE ENFERMAGEM NA TERAPIA INTRAVENOSA PERIFÉRICA: ANÁLISE POR INDICADORES

RESUMO: Pesquisa de delineamento longitudinal com abordagem observacional e quantitativa que teve como objetivo analisar a qualidade da assistência de enfermagem na terapia intravenosa periférica, por meio dos indicadores incidência de flebite, qualidade da cobertura e validade dos cateteres intravenosos periféricos. Os dados foram coletados de outubro de 2012 a agosto de 2013, em três unidades de um hospital de ensino do Estado do Paraná-Brasil, utilizando formulário próprio. Foram avaliados 174 pacientes e 221 cateteres. Os resultados indicaram incidência de flebite entre 20% e 25,33%; a identificação e a validade dos acessos venosos foram classificadas, em sua maioria, como seguras e adequadas segundo análise do Índice de Positividade que classifica a atividade assistencial. Conclui-se que os indicadores avaliados podem ser interpretados, em sua maioria, como favoráveis à qualidade assistencial.

DESCRIPTORIOS: Enfermagem; Qualidade da assistência à saúde; Flebite; Cateterismo periférico.

CUALIDAD DE LA ASISTENCIA DE ENFERMERÍA EN LA TERAPIA INTRAVENOSA PERIFÉRICA: ANÁLISIS POR INDICADORES

RESUMEN: Investigación de delineación longitudinal con abordaje observacional y cuantitativa que tuvo como objetivo analizar la cualidad de la asistencia de enfermería en la terapia intravenosa periférica, por medio de los indicadores incidencia de flebitis, cualidad de la cobertura y validez de los catéteres intravenosos periféricos. Los datos fueron recogidos de octubre de 2012 a agosto de 2013, en tres unidades de un hospital de enseñanza del Estado de Paraná, Brasil, utilizando formulario propio. Fueron evaluados 174 pacientes y 221 catéteres. Los resultados apuntan incidencia de flebitis entre 20% y 25,33%; la identificación y la validez de los accesos venosos fueron clasificadas como seguras y adecuadas en su mayoría, de acuerdo con análisis de Índice de Positividad que clasifica la actividad asistencial. Se concluye que los indicadores evaluados pueden ser interpretados, en su mayoría, como favorables a la cualidad asistencial.

DESCRIPTORIOS: Enfermería; Cualidad de la asistencia a la salud; Flebitis; Cateterismo periférico.

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INTRODUCTION

The quality of care provided in the health services is a socially relevant topic today. The healthcare institutions, represented by service providing organizations, absorbed the precepts of quality procedurally, since they mainly originate from the administration of the manufacturing services⁽¹⁾.

Despite having no unanimous definition of what is meant by Quality in Healthcare⁽²⁾, in the conceptual evolution and practice of this phenomenon, this is perceived and accepted worldwide as effective, efficient, accessible, acceptable, equitable, and safe care⁽³⁾.

Given the understanding of Quality in Healthcare, it is important to mention the role of the nursing team, since their direct and frequent contact with the assisted users leads to incisive interference in obtaining, maintaining or decreasing the quality of care and safety of the users⁽⁴⁾. Thus, as in healthcare as a whole, to ensure the quality of the nursing care, the satisfaction of assisted users must necessarily be included⁽⁵⁾.

Regarding the quality of care in the nursing context, especially in hospital settings, it is worth mentioning the importance of this professional team in the implementation, maintenance and care of Peripheral Intravenous Catheters (PIC), due to these being frequent actions in the management of the intravenous therapy of patients⁽⁶⁾.

Considering that the vast majority of hospitalized patients require at least one venous access, it is necessary for care activities, including those related to intravenous therapy, to be evaluated and controlled, in order to improve the quality of the service provided and to support the (re)planning of the care⁽⁷⁾. In this sense, it is possible to evaluate the quality of nursing care in intravenous therapy, through indicators⁽⁷⁻⁹⁾. The indicators, which can be considered as management tools⁽¹⁰⁾, are measurement units of an activity that allow healthcare professionals to monitor and evaluate the events that affect the users, workers, and organizations, highlighting organizational processes and results, aiming for excellence in the care^(1,9).

In the context of the evaluation of the quality of nursing care related to intravenous therapy through indicators, the incidence of phlebitis

can be highlighted, this being a inflammatory complication of the wall of a vein⁽¹¹⁾. Accordingly, the incidence of phlebitis quality indicator is considered to be one of the main indicators that specifically evaluates the quality of nursing care⁽⁹⁾.

Other important indicators are related to the identification of the permanence time (validity) and identification of the coverage of the PIC, as these relate directly to the safety of the care activities to which the patient is exposed^(8,12).

It is worth mentioning that studies that address the evaluation of the quality of nursing care in intravenous therapy are increasingly important, as they can assist in a more accurate identification of factors that may support improvements in the care process, by means of (re)planning the nursing actions of the service, which may consequently result in the improvement of the healthcare quality itself.

Based on these considerations, this study had the guiding question: What is the quality of nursing care in peripheral intravenous therapy in a public teaching hospital? The aim was to analyze the quality of the nursing care in peripheral intravenous therapy through the indicators, incidence of phlebitis, quality of coverage, and validity of Peripheral Intravenous Catheters in inpatients of a teaching hospital.

METHOD

This study had a longitudinal design and an observational and quantitative approach. It was developed in a teaching hospital in the state of Paraná, Brazil, in three inpatient units. The hospital has an operating capacity of 195 beds, all within the Brazilian National Health System (SUS). The units in question have 26, 28 and 13 beds, respectively, which are intended for hospitalization for medical and surgical care in orthopedics and neurology, medical and general surgical treatment, and cardiology and cardiovascular surgery, identified within the institution as G3, F1 and F2⁽¹³⁾. The choice of these units was motivated by the greater chance of finding patients using PIC, as in other sectors for adults, such as the intensive care unit and emergency unit, central venous catheters are generally used.

The target population consisted of all patients hospitalized in the units chosen, who presented

one or more PIC insertions. The sample was composed of patients who agreed to participate and who met the inclusion criteria: age greater than or equal to 16 years, provided that, in the cases of those less than 18 years of age, the patient was accompanied by a guardian; with preserved orientation in time and space, according to an evaluation through questioning by the researcher; and with the PIC inserted in the inpatient unit.

Data collection was conducted from October 2012 to August 2013 in the units G3 and F2, and in the period from October to December 2012 in F1. This stage of the research had a reduced time in the last unit mentioned because its services were interrupted in the hospital.

For the data collection, a form⁽⁶⁾ was used containing the following data: patient identification, inpatient unit, bed, medical diagnosis, gender, age, date and time of insertion of the PIC, and the signature of the professional that inserted the catheter. The cases of phlebitis were detected according to the presence of clinical signs displayed, using the Phlebitis Scale⁽¹⁴⁾. The instrument was evaluated through a pilot test lasting seven days, in October 2012, and proved adequate.

The collection was performed as follows: every day, the same researcher attended the three units and identified which patients had been fitted with a PIC and met the eligibility requirements. When a patient was identified the instrument was then applied and the insertion site of the PIC observed.

Monitoring was performed for all PICs included in the study for up to 96 hours after their removal, for those patients who remained in the unit, in order to detect post-infusion phlebitis, and also any possible non-compliance in relation to the validity of the catheter, as the replacement standard established by the Commission for the Control of Hospital Infection of the institution was 72 hours.

Data collection was performed by a single researcher, preferably in the evening between 19:30 to 21:30. This period was chosen due to the smaller number of professionals and visitors in the units, which allowed the evaluation of each insertion without interruptions. In all the cases where clinical signs of phlebitis were observed at any stage of development throughout the validity of the venous access, the nursing team was informed.

The data collected were recorded in Microsoft Excel 2010 spreadsheets and the analysis was performed as follows:

1) To analyze the incidence of phlebitis two indicator formulas were used⁽¹⁴⁻¹⁵⁾: the Infusion nursing standards of practice of the Infusion Nurses Society (INS) and the Handbook of Nursing Indicators - NAGEH. These parameters were chosen due to the not unanimity in this form of measurement in the national context. The calculation according to the INS⁽¹⁴⁾ corresponds to the percentage resulting from the total number of patients and the number of cases of phlebitis, while the NAGEH⁽¹⁵⁾ considers the cases of phlebitis from the total number of PICs.

2) To analyze the identification and validity of the PICs the indicator formulas of the validated instrument⁽¹²⁾ were used, with an adjustment for quality analysis, following the standards set in the Positivity Index (PI)⁽¹⁶⁾, which classifies the evaluated medical work as desirable, adequate, safe, borderline, or tolerable. Desirable care is that which achieves a PI of 100%; adequate care between 90-99%; safe care between 80-89%; borderline care between 71-79% and tolerable care a PI of less than 70%.

This study complied with all ethical requirements established by CNS Resolution No. 466/2012, and acceptance to perform the study was received via protocol number 014/2011 from the Research Ethics Committee of the Universidade Estadual do Oeste do Paraná. Patients who comprised the sample were informed about the study aims and their voluntary participation, as well as the assurance that their identification would remain confidential. The Terms of Free Prior and Informed Consent were signed in duplicate by the participant, or their guardian if under 18 years of age.

RESULTS

Patients who agreed to participate and met the eligibility criteria resulted in a sample of 174 participants. Of these, 42.53% were female and 57.47% male; the age ranged between 16 and 92 years, with a median of 42 years (interquartile deviation = 16); the highest concentration (31.03%) of the evaluated patients were aged between 21-30 years. From the total of 174 patients, it was

possible to evaluate 221 PICs.

Table 1 presents the results obtained for the indicator Incidence of Phlebitis, per unit, calculated in two ways.

Board 1 summarizes the results obtained regarding the analysis of the indicator related to the quality of the identification of the PIC,

according to the positivity index and compliance with the nursing care quality standards.

Board 2 presents the results obtained in the analysis of the indicator related to the quality of the validity of the PIC, according to the positivity index and compliance with the nursing care quality standards.

Table 1 - Incidence of phlebitis by inpatient unit. Cascavel-PR-Brazil, 2013

Unit	N. of Patients	N. of PICs	Cases of phlebitis	IP (NAGEH) (%)	IP (INS) (%)
G3	75	94	19	25,33	20,21
F2	79	102	19	24,05	18,62
F1	20	25	4	20,00	16,00
Total	174	221	42	24,13	19,00

Key: PICs: Peripheral intravenous catheters; IP: Incidence of Phlebitis; NAGEH: Núcleo de Apoio à Gestão Hospitalar; INS: Infusion Nurses Society.

Board 1 - Analysis of the quality of the identification of the coverage of the peripheral intravenous catheters installed in the patients. Cascavel-PR-Brazil, 2013

Unit	Number of observations	Complete identification	Inadequate or absent identification	PI (%)	CQ
G3	94	84	10	89,36	Safe
F2	102	81	21	79,41	Borderline
F1	25	24	1	96,00	Adequate
Total	221	189	32	-	-

Key: PI: Positivity Index; CQ: Nursing care quality.

Board 2 - Analysis of the validity of the peripheral intravenous catheters. Cascavel-PR-Brazil, 2013

Unit	Number of observations	PICs up to 72h <i>in situ</i>	PICs over 72h <i>in situ</i>	PI (%)	CQ
G3	94	86	8	91,48	Adequada
F2	102	90	12	88,23	Segura
F1	25	23	2	92,00	Adequada
Total	221	199	22	-	-

Key: PICs: Peripheral intravenous catheters; PI: Positivity Index; CQ: Nursing care quality.

DISCUSSION

The incidence of phlebitis found in this study was close to that found in the statistics of the Commitment to Hospital Quality Program (CQH), which is also based on the NAGEH formula. For the year 2013, in public general hospitals with over 50 beds, participating in the CQH or not, the median incidence of phlebitis was 0.20 or 20%⁽¹⁷⁾. However, the incidence of phlebitis, found in each unit of this study, was lower than or comparable to other Brazilian studies that had as the reference the measurement of the event for the incidence, and the number of patients with PIC for the analyze, which resulted in 18.3%⁽¹⁸⁾ and 24.7%⁽¹⁹⁾.

Despite the difficult of accurately interpreting the results, the findings may possibly signify a positive direction in the quality of nursing care, as the values are close to those found by a CQH Program and comparable with other studies that use the incidence according to the number of punctured patients⁽¹⁸⁻¹⁹⁾. Furthermore, the results of the incidence of phlebitis are lower than a similar study that used an internationally recognized formula that resulted in an incidence of 25.8%⁽⁶⁾.

It is important to note that to compare rates of phlebitis it is necessary to give special attention to the type of methodological design of the studies selected, analyzing the references used for the calculation. This is because this rate can be calculated in several ways and when there is no homogeneity in the studies, the comparison between them is difficult or even impossible. Therefore, the national scientific production on the subject is not homogeneous, since, as mentioned, studies can be found that calculate the incidence based on the NAGEH reference⁽¹⁸⁻¹⁹⁾, and others based on the formula proposed by the INS⁽⁶⁾.

A way to possibly solve the problem, in relation to the lack of standardization in the calculation of the incidence of phlebitis, is to conduct validation studies of the indicator. Thus, comparisons between the results of different studies would be more viable, as variations in the definitions and proposed calculations complicate the analysis and may jeopardize the validity of the indicator, which is relevant for the control of the nursing care quality.

The occurrence of phlebitis, even at a reduced frequency, is a troubling event. It can cause persistent pain and other complications, such as soft tissue infection and even sepsis⁽²⁰⁾, which will

be reflected in an increase in the length of the nursing care, suffering for the patient and family, and a financial impact on the patient, family and healthcare institutions⁽⁶⁾.

Given the above, it is important that the nursing team is able to recognize the signs of phlebitis early. It is mentioned that this diagnosis is the responsibility of the nurse and can not be delegated to another professional of health team, as it implies the prescription and selection of interventions inherent in caring, even with the existence of a specific protocol in the institution⁽⁷⁾.

The results from the analysis of the indicators related to the quality of the identification and validity of the PICs evaluated, can be interpreted as favorable for the care quality. Nevertheless, none of the indicators evaluated obtained results with a 100% positivity index, which would be the desirable quality standard classification for the nursing care. With regard to the identification of the coverage of the PICs, one of the units was classified as borderline due to the absence or inadequacy of identification data, a fact that deserves attention.

A recent study also evaluated the identification and validity of PICs in two public teaching hospitals, places with the same hospital scope evaluated in this study, and used the positivity index in the same way, obtaining the result of nursing care with indicators varying from tolerable to borderline⁽⁸⁾. The authors mention that although both institutions present positivity indices that do not classify the nursing care into parameters defined as safe or appropriate, one hospital performs periodic measurement of nursing care quality indicators, including those related to intravenous therapy, and this institution obtained higher positivity index values⁽⁸⁾.

The evaluation of the quality and safety of the care provided are only possible from the records made in specific documents or forms, and should reflect the continuity of the care. Regarding the PIC, the documentation should include, among other characteristics, the identification, an indication of the person performing the care, and the time and date of the venipuncture⁽¹⁴⁾.

In relation to the validity, it has been suggested that the routine of replacing of PIC every 72 to 96 hours is not required, however, according to the evidence this is necessary⁽²¹⁾, an indication also recommended by the Infusion Nurses Society.

This organization suggests that the rotation of the PIC be performed when clinically indicated, according to the following criteria: evaluation of the condition of the patient, site of venous access, integrity of the skin and catheterized vessel, length of therapy necessary, integrity and permeability of the device, type of coverage, and use of stabilization device⁽¹⁴⁾.

Despite the above indications, in the institution under study, the replacement of the PIC routine is every 72 hours, according to the rules of the Hospital Infection Control Commission, indicating that part of the sample evaluated presented non-compliance in relation to the validity of the PIC.

CONCLUSIONS

The study allowed the analysis of indicators of nursing care quality in peripheral intravenous therapy in a public teaching hospital. Even though the literature does not provide quality parameters regarding the incidence of phlebitis, this indicator, in the two forms in which it was calculated and in the three inpatient units evaluated, was similar to that found in the statistics of a Brazilian hospital quality program, and lower than national studies that used the incidence for measuring the event.

The results obtained using the quality indicators related to the identification and validity of peripheral venous catheters can mostly be interpreted as favorable for the nursing care quality, as they most frequently classified the care as adequate and safe, with only one unit obtaining a borderline classification of the care, in relation to the identification of the catheters. This raises the hypothesis that the results could be even more favorable for the quality if the hospital adhered to the periodic calculation of care quality indicators, in the daily management of the organization.

A limitation of the study was the lack of analysis that would allow inferences to be made. However, the study provides a valuable contribution for the institution studied, as well as the formation of a scientifically supported theoretical framework that can guide actions aimed at nursing care quality in intravenous therapy.

It is hoped that this study will encourage further studies, with different methodological approaches, such as the establishment of the cause and effect relationship between the

presence of phlebitis and the inadequacy of the identification and validity of venous catheters, or other indicators. Finally, it is also hoped that the use of nursing care quality indicators will be a topic more discussed in studies and also in the everyday managerial practice of healthcare organizations.

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