

Content validation of the nursing intervention Dialysis Access Maintenance

Validação de conteúdo da intervenção de enfermagem Manutenção de Acesso para Diálise

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ABSTRACT

Objective: to validate the content of the Dialysis Access Maintenance intervention. **Methods:** methodological validation study, composed of 28 participants who analyzed each activity of the intervention through the Likert scale, considering the importance and objectivity, which provided the calculation of the index of validity of content and frequency to assess the realization of the activities. **Results:** the 11 intervention activities were validated. Of these, seven obtained a content validity index ≥ 0.8 and four, > 0.5 and < 0.8 . In the qualitative part, three categories emerged: 1) Positive reinforcement of the Nursing Interventions Classification activity; 2) Contribution to improve the Nursing Interventions Classification activity; and 3) Disagreement regarding the activity proposed by the Nursing Interventions Classification. **Conclusion:** all activities were considered important and objective, validating the intervention. **Descriptors:** Validation Study; Renal Dialysis; Nursing Process.

RESUMO

Objetivo: validar o conteúdo da intervenção Manutenção de Acesso para Diálise. **Métodos:** estudo metodológico, de validação, composto de 28 participantes que analisaram cada atividade da intervenção por meio da escala likert, perante a importância e objetividade, a qual proporcionou o cálculo do índice de validade de conteúdo e frequência para avaliar a realização das atividades. **Resultados:** as 11 atividades da intervenção foram validadas. Destas, sete obtiveram índice de validade do conteúdo $\geq 0,8$ e quatro, $> 0,5$ e $< 0,8$. Na parte qualitativa, emergiram três categorias: 1) Reforço positivo à atividade da *Nursing Interventions Classification*; 2) Contribuição de melhoria para atividade da *Nursing Interventions Classification*; e 3) Discordância em relação à atividade proposta pela *Nursing Interventions Classification*. **Conclusão:** todas as atividades da intervenção foram consideradas importantes e objetivas, validando a intervenção. **Descritores:** Estudos de Validação; Diálise Renal; Processo de Enfermagem.

Introduction

Chronic Kidney Disease is the presence of abnormalities of the kidneys, structural or functional, existing for a period exceeding three months, with implications for physical well-being⁽¹⁾. It is considered a worldwide public health problem⁽²⁾ and evidenced as a disease of high morbidity and mortality. The total estimated quantity in the 2018 national census is 133,464 clients on renal dialysis in Brazil, indicating an increase of 6,881 clients (5.7%) in one year. The estimated figure with respect to the number of deaths in 2018 consisted of 25,986, which represents a mortality rate around 19.5%⁽³⁾.

Chronic kidney disease has five stages, classified according to the glomerular filtration rate. From stage 1 to 4, conservative treatment is performed to slow the progression of renal dysfunction^(1,4). In stage 5, the treatment occurs through one of the three possibilities of renal replacement therapy: hemodialysis, peritoneal dialysis, or renal transplantation. Of these, the most used is conventional hemodialysis, representing a total of 92.3% of the clients on renal replacement therapy, which requires the confection of a vascular access. This is classified into four modalities: the most used, the arteriovenous fistula (73.8%), followed by the long-term catheter (14.4%), short-term catheter (9.2%) and vascular prosthesis (2.6%)⁽³⁾.

In performing nursing care to patients on dialysis, it is essential to use the nursing process, which in its definition consists of a method composed of five interrelated and dynamic steps⁽⁵⁾. In this study, the focus is on the implementation stage of nursing care, when the proposed nursing interventions are performed. One of the most used taxonomies to standardize these interventions is the Nursing Interventions Classification (NIC)⁽⁶⁾.

The intervention on which the study unfolded was the Dialysis Access Maintenance, which presents as definition the conservation of vascular access sites (arteriovenous). This intervention presents 11 activi-

ties that have as central focuses of care the maintenance of catheter and arteriovenous fistula permeability, infection control measures, catheter anticoagulation mechanism, and care to avoid mechanical compression of the access as an orientation for health education⁽⁶⁾.

A search was conducted in the databases Latin American and Caribbean Literature in Health Sciences (LILACS), Nursing Databases (BDENF), Medical Literature Analysis and Retrieval System On-line (MEDLINE), Us National Library of Medicine National Institutes of Health (PUBMED), Cumulative Index to Nursing and Allied Health Literature (CINAHL) and Elton B. Stephens Company (EBSCO), in the period from April 2019 to July 2019, with the following descriptors and MESH, plus the Boolean operator "And", being them: 1) Validation Studies and Nursing Process/Validation Studies and Nursing Process; 2) Validation Studies and Renal Dialysis/Validation Studies and Renal Dialysis; and 3) Nursing Process and Renal Dialysis/Nursing Process and Renal Dialysis. This search aimed to verify validation regarding the intervention used in this study. A total of 931 articles were found and, after analyzing the title and abstract, it was concluded that the validation work of the intervention Dialysis Access Maintenance is unprecedented in the literature.

Thus, the object of the study was the content validation of the activities related to the NIC intervention Dialysis Access Maintenance. The research question was: Do the scores assigned by nurses to the activities described in the nursing intervention "Dialysis Access Maintenance" confer content validity?

This study may contribute to the improvement of care practice through the implementation of nursing activities of the NIC, in addition to contributing to a safe nursing practice with minimization of adverse events related to hemodialysis access.

The objective was to validate the intervention activities proposed by the Nursing Interventions Classification of Dialysis Access Maintenance.

Methods

This is a content validity study. The study had as its anchor scenario for the recruitment of participants the nephrology sector of a university hospital in Rio de Janeiro, RJ, Brazil.

The participants were approached both through the anchor scenario and the snowball technique, when colleagues who met the inclusion criteria were indicated, and through a group in an application for communication via the Internet with nephrology nurse professionals from several Brazilian states. The sample was non-probabilistic, by convenience.

To be included as participants, nurses met the following criteria adapted from Fehring based on the literature⁽⁷⁻⁸⁾: 1) Master's degree in nursing - 4 points; 2) Master's degree in nursing with relevant content in the clinical area - 1 point; 3) Published research in the diagnoses area - 2 points; 4) Published article in the diagnoses area in a refereed journal - 2 points; 5) Doctorate in Nursing Diagnoses - 2 points; 6) Clinical practice of at least one year in the clinical nursing area - 1 point and 7) Specialization in the clinical area with proven clinical practice - 2 points; All participants were to achieve at least 5 points.

To give voice to professionals coming from professional practice, where expertise is valuable, although it does not always meet the criteria⁽⁹⁾, nurses who had five years or more of experience in hemodialysis room were also considered as experts, to recognize the practical experience of these professionals. Nurses who were on vacation or medical leave in the anchor scenario were excluded.

Data collection was carried out between March and July 2020 through the technique of self-completion of an online questionnaire, available electronically on the Google Forms platform, with open and closed questions. During the development of the study, the new edition of the NIC (seventh edition) was released in September 2020; however, when analyzing this new edition, it was found that the activities proposed in the sixth edition for the intervention "Dialy-

sis Access Maintenance" had not changed.

The first part of the questionnaire consisted of questions about the identification data, sociodemographic aspects, and occupational data of the participants⁽¹⁰⁾. The second part of the instrument brought the guidelines for its completion, the definition of the intervention "Dialysis Access Maintenance" and the 11 activities related to this intervention. Each activity was evaluated using a Likert scale with five response options: none, little, moderate, much, or total. Three criteria were checked: importance, objectivity, and frequency. Besides the presence of an open field for participant contributions, present in each activity, as well as at the end of the instrument.

The criterion of importance can be defined by the extent to which each activity is essential for the intervention and how well it can be discriminated from other activities. Objectivity refers to an activity described in an objective and practical way. Frequency, on the other hand, refers to the systematic performance of the activity in the unit⁽¹⁰⁾, in which the higher its value, the greater the frequency with which it is developed.

The data were organized in Microsoft Excel spreadsheets, analyzed by simple descriptive statistics and calculation of the content validity index (CVI). The values assigned to the Likert scale were 1=0; 2=0.25; 3=0.5; 4=0.75; 5=1. The CVI was calculated by the arithmetic mean of the values attributed to objectivity and importance⁽¹¹⁾. For frequency, the same Likert scale structure was used to obtain the objectivity and importance data. The CVI values and frequency are the result of the calculation of the average of the values attributed by everyone divided by the total number of participating individuals.

For both the evaluation of each nursing activity and the evaluation of the nursing intervention, a content validity index of 0.80 or higher was considered; activities with values higher than 0.50 and lower than 0.80 were considered complementary and feasible for implementation. Interventions with proportions lower than 0.50 were judged as not relevant⁽¹⁰⁾. To com-

plement the analyses of the content validity indexes, the participants' comments on the review of the activities were considered.

The research was conducted in accordance with Resolution No. 466/2012. It was approved by the Ethics and Research Committee of the institution according to opinion No. 3,894,686/2020 and Certificate of Ethical Appraisal Submission No. 26570619.4.0000.5259. All participants signed the Informed Consent Form.

Results

A total of 28 individuals answered the questionnaire, of which two (7.1%) met Fehring's adapted criteria only, eight (28.6%) met Fehring's adapted criteria and acting time \geq five years, and 18 (64.3%) met acting time \geq five years exclusively.

The average age of the participants was 39 years, ranging from 26 to 58 years. The average time

of training was 16 years, ranging from two to 34 years. As for the professional-academic formation, 19 (67.9%) nurses had a *lato sensu* post-graduation (specialization) and nine (32.1%) had *stricto sensu*, with seven (25%) having a master's degree and two (7.1%) having a doctor's degree.

The overall content validity index obtained in the nursing intervention Dialysis Access Maintenance was 0.81, a value considered relevant. Table 1 presents the CVI of the activities, with seven evaluated by nurses with CVI of the activity \geq 0.8 and four with content validity index of the activity $>$ 0.5 and $<$ 0.8.

As for frequency (Table 2), only four activities reached the cutoff point \geq 0.8. The activity with the highest mean frequency score was teaching the patient how to take care of the dialysis access site (0.88). The activity with the lowest mean frequency score corresponded to the application of sterile gauze, antimicrobial ointment and dressing to the dialysis central venous catheter site at each treatment (0.61).

Table 1 – Activities evaluated for importance and objectivity with Content Validity Index. Rio de Janeiro, RJ, Brazil, 2020

Nursing Activities	Content Validity Index		
	Importance	Objectivity	Average*
1. Monitor the catheter exit site for migration	0.85	0.77	0.81
2. Monitor the access site for redness, swelling, heat, drainage, bruising, bleeding, and decreased sensation	0.91	0.89	0.90
3. Apply sterile gauze, antimicrobial ointment, and dressing to the dialysis central venous catheter site at each treatment	0.67	0.66	0.67
4. Monitor the patency of the arteriovenous fistula at frequent intervals (e.g., palpate for fremitus and listen for noises)	0.90	0.85	0.88
5. Heparinize newly inserted central venous dialysis catheters	0.81	0.78	0.79
6. Heparinize dialysis central venous catheters again after dialysis or every 72 hours	0.83	0.79	0.81
7. Avoid mechanical compression of peripheral access sites	0.78	0.71	0.75
8. Avoid mechanical compression of the patient's limbs near the dialysis central catheter	0.73	0.74	0.74
9. Teach patient to avoid mechanical compression at peripheral access site	0.87	0.84	0.85
10. Teaching the patient how to care for the dialysis access site	0.93	0.88	0.90
11. Avoid puncture and blood pressure check at the peripheral access site	0.88	0.86	0.87

*Mean: Sum of the Content Validity Index of the Importance and Objectivity criteria, divided by two

Table 2 – Average of values attributed to the frequency of nursing activities. Rio de Janeiro, RJ, Brazil, 2020

Nursing Activities	Average
10. Teach the patient how to care for the dialysis access site	0.88
2. Monitor the access site for redness, swelling, heat, drainage, bruising, bleeding, and reduced sensation	0.85
11. Avoid puncture and blood pressure checks near the peripheral access extremity	0.83
9. Teach patient to avoid mechanical compression at the peripheral access site 1	0.80
1. Monitor catheter exit site for migration	0.71
5. Heparinize newly inserted central venous dialysis catheters	0.79
4. Monitor the permeability of the arteriovenous fistula at frequent intervals (e.g., palpate for fremitus and auscultate noises)	0.76
6. Heparinize dialysis central venous catheters again or every 72 hours	0.76
7. Avoid mechanical compression at peripheral access sites	0.74
8. Avoid mechanical compression on the patient's limbs near the dialysis central catheter	0.71
3. Apply sterile gauze, antimicrobial ointment, and dressing to the dialysis central venous catheter site at each treatment	0.61

From the analysis of the participants' observations/recommendations, three categories emerged: Positive reinforcement to the NIC activity; Contribution of improvement to the NIC activity; and Disagreement regarding the activity proposed by the NIC.

Positive reinforcement to the NIC activity: *Preferably, the double lumen catheter dressings are done before the patient enters a hemodialysis session, on the fistulas, when accommodating the patient in the chair, the limb is evaluated, including the infection, presence or not of fremitus, in order to, if necessary, take the appropriate measures such as, for example, administration of antibiotic therapy in case of presence of infection to the presence of fremitus and if there is an infection point (I21).*

Improvement contribution to the NIC activity: *The frequency of evaluation should be according to each patient's need and possibility (I22).*

Disagreement regarding the activity proposed by the NIC: *I think that the need to use antimicrobial ointment is of little importance if the strict aseptic technique is used (I19). In cases where the implantation is made in the unit itself and the patient will be submitted to hemodialysis soon after, there is no need to heparinize, however, if the patient is not immediately submitted to hemodialysis, the volume described at the tip of each lumen must be followed, neither more nor less (I21). The catheter lock is not necessarily made with heparin. It can be made with other drugs, such as citrate,*

or just saline solution in cases of use of neutral pressure devices (I25). We use the closed system connector for hemodialysis central venous catheters and apheresis in approximately 75.0% of the double lumen catheters for hemodialysis. The others are patients with access failure, in whom we use 1ml of heparin plus saline to complete the catheter volume (I12).

Discussion

This study was limited by the small number of nurses who met the selection criteria for participation in the study, which interfered with the sample size and the possibility of glimpsing other practical perspectives for the evaluation of the nursing intervention. Strategies related to Dialysis Access Maintenance are primarily the responsibility of nurses, and the use of validated nursing interventions is essential for a scientific nursing practice.

"Teaching the patient how to take care for the dialysis access site" showed a higher content validity index and a higher frequency in relation to other activities. The activity with the lowest mean content validity index and frequency was related to the use of antimicrobial ointment. This activity generated disagreement among the specialists because the use

of antimicrobial ointment is not common among the professionals. Despite the use of sterile gauze and dressing at the site of the dialysis central venous catheter at each treatment session, the use of antimicrobial ointment is still controversial⁽¹²⁾.

The use of topical antibiotics or antimicrobial barriers at the hemodialysis catheter ostium exit provides a significant reduction of 85% as to the use of mupirocin and 95% as to the use of chlorhexidine impregnated films in the occurrence of infectious events and bacteremia^(1,12). The choice of antimicrobial should be made according to medical availability and choice due to the differences between the types of antimicrobials and the reduction of bacteremia. Despite these benefits, antimicrobial ointments are not widely used for fear of emergence of resistant microorganisms⁽¹²⁾.

The dressing should be done with aseptic technique or no touch when the ostium or catheter extremities are not touched with hands or gloves⁽¹⁾. As for colonization and bacteremia at the catheter exit site, they showed no difference when transparent, semi-permeable, and sterile gauze dressings were used⁽¹⁾. The antiseptic technique and the use of dressings are decisions by consensus both in the literature and in the participants' clinical practice.

In the activity of heparinizing newly inserted central venous catheters for dialysis, the low value of CVI may be associated with the participants' justification that patients, in general, dialyze immediately after catheter insertion, when the filling of catheter lumens is performed only with saline solution at 0.9% in their settings. The literature mentions the need to perform lock with heparin, 4% citrate or other sealing solutions, to prevent thrombus formation inside the catheter⁽¹³⁻¹⁴⁾.

Heparin is the most used solution for the sealing of hemodialysis central venous catheters. This substance, when used long-term, is associated with bloodstream infection, hemorrhage, and catheter dysfunction. Citrate, on the other hand, acts in blocking the coagulation cascade reaction by calcium ions in

the blood and does not affect the coagulation function, thus being a better blocking solution for the reduction of catheter-related complications⁽¹⁴⁻¹⁵⁾. The use of citrate has been shown to be more beneficial when associated with antimicrobials, rather than pure citrate and heparin⁽¹¹⁻¹³⁾. However, *S.aureus* infection is related to sealing using citrate rather than heparin⁽¹⁴⁾.

Avoiding mechanical compression of periphe-ral access sites and avoiding mechanical compression of the patient's limbs near the central dialysis catheter were considered important and objective. Compression of the arteriovenous fistula flow should be avoided since increased intraluminal access pressure potentially increases bleeding, as well as promoting permanent fistula loss. Another important action is to evaluate the impact of manual versus mechanical compression, the use of forceps after needle removal on access/stenosis permeability, and it is recommended to proceed with the relevant compression for hemostasis after dialysis^(1,16).

About monitoring the access site for redness, edema, heat, drainage, hematomas, bleeding, and reduced sensitivity; this activity should be performed in all sessions and at three times, before, during and after hemodialysis⁽¹⁾. It is up to the nursing professionals to guide the patient and family members as to the monitoring of these signs.

The main care and orientation offered to the clients for the preservation of the limb of the arteriovenous fistula consist in avoiding picking up weight on it, not lying on the arm, not letting the blood pressure be checked, avoiding blood collection in the limb, avoiding puncture of the fistula by a professional who is not qualified, not remove the crusts formed by punctures in the region, perform daily exercises in the limb where the arteriovenous fistula was made, perform adequate compression for hemostasis after dialysis, observe daily the presence of fremitus in the arteriovenous fistula, verify any modification in the fistula site, among other cares⁽¹⁶⁻¹⁷⁾.

A criticism made by the experts regarding the

intervention is about the lack of clarity of the activities related to each type of dialysis access, since it may be a short-term catheter, long-term catheter, arteriovenous fistula, and graft regarding the appropriate time to use each of these types of access and the main care for their preservation. What shows the need for further studies to continue this one.

Conclusion

It was possible to validate the content of the Dialysis Access Maintenance. According to the evaluated criteria, all activities of this intervention were considered important and objective. After the specialists' analysis, it was possible to verify the need to reformulate the intervention activities regarding the discrimination in relation to which type of access each activity refers to, because the nursing actions and the health education process itself in the scope of access maintenance for the nursing team, the client and family members are distinct, and these should be performed according to the peculiarity of each type of dialysis access, whether arteriovenous fistula, arteriovenous graft, short-term catheter or long-term catheter.

Collaborations

Gonçalves LM, Lins SMSB and Souza PA contributed to the conception and design, data analysis and interpretation, and writing of the article. Tavares JMAB, Pires BMFB and Assad LG contributed to the relevant critical review of the intellectual content and final approval of the version to be published.

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