

ORIGINAL ARTICLE

AMPUTATION DUE TO COMPLICATIONS OF DIABETES: NURSING CARE PROTOCOL

Nalva Kelly Gomes de Lima¹ 

Jessyka Chaves da Silva¹ 

Cristiana Brasil de Almeida Rebouças² 

Alexsandro Silva Coura¹ 

Nuno Damácio de Carvalho Félix³ 

Inacia Sátiro Xavier de França¹ 

ABSTRACT

Objective: to produce and validate a Nursing care protocol for people amputated due to diabetic complications. **Methods:** a methodological research study conducted in Recife-PE between February 2019 and October 2020, comprising the following stages: 1) Theoretical phase: integrative literature review; 2) Production phase; 3) Validation by specialists; and 4) Validation by the target population. The Content Validity Index was used in the validation by specialists. The Agreement Index was employed in the validation by the target population. **Results:** the items included in the instrument permeate the following care dimensions: Biological, Psychological and Socio-educational. Validation by the evaluators was in charge of 13 specialists. The instrument presented an index of 0.94. Validation by the target population was conducted with 33 participants; all the items achieved an agreement index $\geq 80\%$. **Conclusion:** the protocol enables comprehensive and humanized care, encouraging autonomy and assisting in rehabilitation; it also allows for a reflection regarding individualization of Nursing care.

DESCRIPTORS: Nursing Protocols; Nursing Care; Amputation; Complications of Diabetes; Validation Study.

HOW TO REFERENCE THIS ARTICLE:

Lima NKG de, Silva JC da, Rebouças CB de A, Coura AS, Félix ND de C, França ISX de. Amputation due to complications of diabetes: nursing care protocol. *Cogitare Enferm.* [Internet]. 2022. [accessed "insert day, month and year"]; 27. Available on: <http://dx.doi.org/10.5380/ce.v27i0.87682>.

¹Universidade Estadual da Paraíba, Departamento de Enfermagem, Campina Grande, PB, Brasil.

²Universidade Federal do Ceará, Departamento de Enfermagem, Fortaleza, CE, Brasil.

³Universidade Federal do Recôncavo da Bahia, Departamento de Enfermagem, Santo Antônio de Jesus, BA, Brasil.

INTRODUCTION

Diabetes Mellitus (DM) represents a global problem due to habits detrimental to health such as sedentary lifestyle and obesity, which promote non-control of the disease, leading to vascular and neurological complications – precursor conditions of diabetic foot¹. This represents a public health problem that can lead to amputation of the lower limbs (LLs). It has significant incidence in the Brazilian population, with repercussions in quality of life and in higher financial costs for its treatment².

It is verified that 85% of the people with diabetic foot suffer amputations, with an estimate of two amputations due to complications of diabetes, every minute and at the global level. This fact reveals the social and economic impact of diabetic foot for people with the disease, which makes them vulnerable when trying to reintegrate into society, either through participation in social events that do not provide accessibility to people with disabilities or through re-entering the labor market and having to deal with prejudice towards disability³.

People amputated due to diabetic complications have a lower life expectancy when compared to those with DM without amputations. This risk is associated with an important burden of cardiovascular diseases in these patients and that predisposes to the occasion. Thus, assistance should be seen in a comprehensive health context⁴. It is necessary to strengthen the implementation of effective health education measures by the multiprofessional team, by promoting the professionals' awareness and improving resoluteness in the health prevention actions – which should be directed at preventing new injuries and infections, encouraging the people involved by making them co-responsible for the treatment⁵.

From this perspective, Nursing care is indispensable to strengthen healthcare through health education, in order to improve patients' adherence to the treatment and achieve effectiveness in glycemic control, thus reducing amputations and reamputations⁶. Protocols are understood as paramount tools in health care, identified by the specification of the care measures, which encompasses a series of operational indications on the practice, in order to provide care guidelines to the professionals, provide effective understanding and reduce errors⁷. They also increase precision of the guidelines for the patients, contributing to a more dynamic and efficient rehabilitation⁵.

The scientific production of the Nursing protocols devoted to patients with diabetic complications proves to be effective. However, there is a gap in the knowledge about the Nursing care protocols targeted at amputated people. It is necessary to prepare a specific Nursing care protocol, with a view based on humanized and comprehensive care⁸ and that encompasses safe interventions with positive results. The objective of the current research study was to prepare and validate a Nursing care protocol for people amputated due to diabetic complications.

METHOD

This is a methodological research study⁹ developed according to the recommendations set forth by Pasquali¹⁰⁻¹¹, through the following stages: 1) Theoretical phase: integrative literature review; 2) Production phase; 3) Validation by specialists; and 4) Validation by the target population. The research was developed between February 2019 and October 2020 in Recife-PE.

In the theoretical phase, and integrative literature review was conducted aimed at identifying the Nursing care for people amputated due to diabetic complications. The

Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) recommendations were followed. The search for the research studies was conducted in the following portals and databases: LILACS, Medline, PubMed, Scopus and Web of Science; using the descriptors and Boolean operators specified below: Nursing Care AND Amputation; Nursing Care AND Diabetes Complications; as well as the following filters: language (English, Portuguese and Spanish), and year (from 2015 to 2019). Of 2,389 research studies, 12 answered the guiding question.

In the elaboration phase, the protocol elements obtained in the review were prepared, with the constitutive definitions represented by the domains and the operational definitions represented by Nursing care. The operational definitions were in accordance with the most concrete and comprehensive concepts in the construct, in order for the definition to move from abstract to concrete and represent the construct's physical behavior, enabling elaboration of the items related to operationalization of the instrument¹¹.

The care guidelines for amputated people set forth by the Ministry of Health¹² was used in this stage, serving as the basis to elaborate the instrument. The protocol was prepared including the following domains: identification data, pain, stump, dressing, motor difficulties, DM control, emotional care, self-care and care measures after discharge, adaptation to the prosthesis, and referral.

The search for the specialists for content validation was conducted in the Lattes Platform and, after due analysis, they were invited to participate via email contacts. After their acceptance, they received instructions related to filling in the Free and Informed Consent Form (FICF) and diverse information to characterize the evaluators.

Assessment was performed using a Likert scale prepared on Google Forms, with values from one to four for each item of the instrument, namely: totally adequate (four), adequate (three), partially adequate (two), and inadequate (one)¹³.

Thirteen Brazilian nurse-evaluators specialists in the content who underwent training in the North, Northeast and South regions of the country were the study participants, in addition to 33 clinical nurses working at hospitals in the city of Recife, Pernambuco, Brazil, for validation by the target population. The content specialists were selected according to the adapted Fehring criteria¹⁴, including those who obtained at least five points (Chart 1).

Chart 1 – Adapted criteria to assemble the committee to validate the Nursing care protocol for people amputated due to diabetic complications. Recife, PE, Brazil, 2020

Criteria	Score
MSc in the health area as minimum degree	1
Having developed a dissertation and/or thesis in the Nursing area with a theme targeted at Nursing care, amputation and/or DM.	3
Having at least one year of experience in the provision of guidelines for people amputated due to diabetic complications in the clinical practice.	2
Having at least two years of professional experience in care targeted at people amputated due to diabetic complications.	3
Having a specialization in the Nursing area with a course conclusion paper on Nursing care for people with Diabetes Mellitus and/or amputated individuals, and/or production and validation of instruments.	2

Having published scientific papers in the health area on Nursing care for people with Diabetes Mellitus and/or amputated individuals, and/or production and validation of instruments.	2
Having participated in research groups/projects in the last 12 months, involving Nursing care for people with Diabetes Mellitus and/or amputated individuals, and/or production and validation of instruments.	2
Maximum score	15

Source: Adapted from Fehring (1994).

Validation by the target population was conducted according to the recommendations set forth by Pasquali¹⁰, with a sample comprised by 30 to 40 clinical nurses who worked in reference hospitals for trauma and vascular care. The inclusion criteria were as follows: being a Nursing graduate and having worked/being currently working in care provision for patients amputated due to diabetic complications. The exclusion criteria in both validation processes were the following: not completing the entire instrument and answering the instrument more than once – in this case, one of the instruments was excluded and the other was included in the research.

The data referring to the content evaluators were analyzed based on the Content Validity Index (CVI). The CVI score was calculated by adding up the agreement level of the items marked with “three” or “four”, divided by the total number of answers to the items. The criterion for validation adopted was as follows: As a first step, each item of the instrument was assessed individually; in this evaluation, all the items that obtained CVI values above 0.70 were considered valid. In the second phase, the instrument was evaluated as a whole, i.e., the entire instrument, which should have a minimum agreement level of 0.80¹³; therefore, all the CVI values calculated separately were added up and the result was subsequently divided by the number of items included in the instrument.

Validation by the target population was conducted with 33 clinical nurses working in two reference hospitals for trauma and angiology care located in the city of Recife, Pernambuco, Brazil, and affiliated to the Unified Health System (Sistema Único de Saúde, SUS). The contacts were made via phone calls and those interested were sent an access link with the FICF, the data collection instrument and instructions to fill it in Google Forms. The form included two components: items to characterize the participants; and evaluative items for the protocol (domains: organization, writing style, appearance and motivation).

In relation to the data evaluated by the target population, items with a minimum agreement level of 80% in the positive answers were considered valid. Items with an agreement index below 80% were considered worthy of change, as indicated in the literature¹⁵. Calculation of the overall adequacy score was performed by adding up the scores obtained, dividing by the total scores and multiplying by 100, presenting the ratio as a percentage.

The research was approved by the Research Ethics Committee of Universidade Estadual da Paraíba, under favorable opinion No. 4,174,186.

RESULTS

The literature review stage allowed identifying the Nursing care for people amputated due to diabetic complications, grounding elaboration of the protocol. Thus, the technology was produced in order to provide comprehensive care, minimizing the predominant care

fragmentation found in the current biomedical model.

The protocol should be applied by clinical nurses in hospital clinical units that treat the researched population, and should be used in the period following amputation. The protocol addresses the following domains: patient's identification data; care measures related to pain; stump; dressing; motor difficulties; DM control; emotional care; self-care and care measures after discharge; adaptation to the prosthesis; and referral. Figures 1 and 2 show the technology that was produced.

NURSING CARE PROTOCOL FOR PEOPLE AMPUTATED DUE TO DIABETIC COMPLICATIONS		
IDENTIFICATION DATA		
User of the health service:		
Mother's name:		
Date of birth:	Age:	Skin color:
Schooling level:	Occupation:	Marital status:
Care dimensions	Biological	<p>DOMAINS:</p> <p>Pain</p> <ul style="list-style-type: none"> - Verify pain report: () Yes () No - Evaluate its characteristics (onset, frequency, intensity): <ul style="list-style-type: none"> • Description: _____ - Pain classification from 0 to 10: 0 – 1 – 2 – 3 – 4 – 5 – 6 – 7 – 8 – 9 – 10 - Perform non-pharmacological techniques for pain relief (relaxation, heat and cold application, massage): <ul style="list-style-type: none"> • () Yes () No • Description: _____ - Administer analgesics according to the medical prescription: () Yes () No
		<p>Stump</p> <ul style="list-style-type: none"> - Identify the type of amputation: () Open () Closed - Verify the amputation level: _____ - Assess stump characteristics: <ul style="list-style-type: none"> • Location _____ • Shape: () Globular () Conical • Presence of stitches: () Yes () No • Sensitivity signs: () Yes () No • Burning sensation on the stump () Yes () No • Grafting: () Yes () No • Bony spikes: () Yes () No - Investigate stump position: <ul style="list-style-type: none"> • Remain in functional position: () Yes () No - Analyze suture stitches (they should be removed 10 to 12 days after amputation, in the absence of contraindication) <ul style="list-style-type: none"> • Indicates removal: () Yes () No - Presence of scar: () Yes () No <ul style="list-style-type: none"> • Description: _____
		<p>Dressing</p> <ul style="list-style-type: none"> - Exchange dressing: <ul style="list-style-type: none"> • Dressing exchange frequency: _____ • Type of coverage: _____ • Identification of physiological signs during exchange: () Yes () No • Description: _____ - Perform bandaging: <ul style="list-style-type: none"> • Bandaging with compression distal to the stump and pressure gradually reduced proximally to the amputated limb: () Yes () No <p>Note: If a tingling sensation is reported after bandaging, reduce the pressure.</p>
		<p>Motor difficulties</p> <ul style="list-style-type: none"> - Identify the client's current transferring capacity: () Yes () No - Select and instruct the client's transferring technique: () Yes () No - Instruct the patient on the adequate techniques, aiming at achieving the highest autonomy level possible: () Yes () No - Indicate motor physiotherapy, or through follow-up and evaluation by a physiotherapist: <ul style="list-style-type: none"> • Prevent contractures in the joints by means of passive or active exercises, according to the clinical evaluation • Strengthen muscle control of the amputated limb by means of passive or active exercises, according to the clinical evaluation

Figure 1 – Protocol corresponding to the Nursing care for people amputated due to diabetic complications, third version. Recife, PE, Brazil, 2020. Source: The authors, 2020.

Care dimensions		<ul style="list-style-type: none"> Strengthen and move the unaffected limb by means of passive or active exercises, according to the clinical evaluation Encourage early walking with aids, in case of lower limb amputation <p>- Provide support for the stump when sitting, for patients who suffered transtibial amputation or at a lower level, with the knee extended: () Yes () No</p>
	Diabetes control	<p>Provide guidelines about:</p> <ul style="list-style-type: none"> Adequate diet and referral to a nutritionist: () Yes () No Pharmacological treatment as prescribed (medication, schedule, dosage, side effects): () Yes () No Application of the insulin injections as recommended: () Yes () No Capillary glycemia check when necessary: () Yes () No <p>Investigate access to self-monitoring devices () Yes () No</p>
	Psychological	<p>Emotional care</p> <p>- Verified mood swings (sadness, anxiety, fear): () Yes () No</p> <p>- Evaluate difficulty accepting the amputation: () Yes () No</p> <p>Description: _____</p> <p>- Investigate support network (family/friends): () Yes () No</p> <p>Description: _____</p> <p>- Provide emotional support and refer to monitoring with a specialist: () Yes () No</p> <p>- Provide guidelines on patient's/family's doubts and questions: () Yes () No</p>
	Socio-educational	<p>Self-care and care measures after discharge</p> <p>Provide guidelines about:</p> <p>- Stump: () Yes () No</p> <ul style="list-style-type: none"> With removal of the stitches, the stump should be cleaned with warm water and neutral soap (avoid leaving it immersed in order to prevent maceration) Dry by compression, searching for irritated areas Massage with an emollient product. Start from the proximal end of the stump towards the suture line If bandaging could not be performed, and it is indicated by a vascular physician, a compressive mesh can be used, if available. <p>- Activities of daily living: () Yes () No</p> <ul style="list-style-type: none"> Bathing should be done in the shower, with the patient sitting on a firm seat. The patients should sit on a chair to take off their clothes and the prosthesis They should remain sitting to dry their body and put on the prosthesis again Patients amputated at the level of the femur: Sit down for dressing. Firstly, put on the shirt and the socks, then adjust the prosthesis and fix the pelvic belt over the shirt Put on underwear over the prosthesis, initially placing the limb with the prosthesis
		<p>Adaptation to the prosthesis</p> <p>- Verify indication of the prosthesis, through a joint evaluation with the specialist: () Yes () No</p> <p>- Guidelines:</p> <p>Protect stump skin when using the prosthesis: () Yes () No</p> <ul style="list-style-type: none"> Cover the stump with a sock made of a soft and comfortable fabric and appropriate to its shape and size Change the socks twice a day, in order to prevent moisture on stump skin The sock should be intact, with no folds or seams in contact with the skin Patients with a long prosthesis and wearing a pelvic belt should place the belt over the shirt, in order to prevent discomfort and development of pressure ulcers Instruct to transfer body weight to the limb with the prosthesis, in order to improve weight distribution For upper limb prostheses, it is relevant to provide guidelines on grip, getting accustomed with the weight of the objects, and sensitivity
		<p>Referral</p> <p>- Referral indicated: () Yes. Place: _____</p> <p>() No</p> <p>Guidelines: () Yes () No</p>
	<p>Date: ____ / ____ / ____</p> <p>Signature: _____</p>	

Figure 2 – Protocol corresponding to the Nursing care for people amputated due to diabetic complications, third version. Recife, PE, Brazil, 2020

Source: The authors ,2020.

The validation by specialists stage was conducted with the participation of 13 nurse-evaluators who assessed the protocol in relation to its content. The variables included in the form to characterize the evaluators are organized in Table 1.

Table 1 – Variables included in the form to characterize the evaluators. Recife, PE, Brazil, 2020

Variables	n	%
Gender		
Female	12	92.3
Male	1	7.7
Race/Skin color		
White	08	61.5
Brown	04	30.8
Asian	01	7.7
Degree		
MSc	09	69.2
PhD	03	23.1
Post-PhD	01	7.7
Have you already provided care to people amputated due to diabetic complications?		
Yes	10	76.9
No	03	23.1
Have you already worked in production and validation of instruments?		
Yes	11	84.6
No	02	15.4
Place of training		
Northeast	09	69.2
North	1	7.7
South	3	23.1

Source: The authors ,2020.

The evaluators' age varied from 26 to 55 years old, with a mean of 34.92. Their training time was between four and 35 years, with a mean of 11.76. There was a variation from nine to 15 points in the score obtained according to the adapted Fehring criteria: seven evaluators obtained 15 points (maximum recommended score), three obtained 12 points, two obtained 13 points, one obtained 10 points, and one specialist obtained nine points, totaling the sample of 13 specialists who took part in the research.

With regard to the evaluation of the instrument, all items were validated, with $CVI \geq 0.70$, as well as the entire protocol, which presented $CVI = 0.94$, a value above the one recommended for validation of the entire instrument ($CVI \geq 0.80$). Thus, Table 2 presents the domains included in the protocol and the respective CVI values for each domain.

Table 2 – Domains included in the protocol and their respective CVI values. Recife, PE, Brazil, 2020

DOMAINS	CVI
Patient's identification data	0.95
Pain	0.90
Stump	0.96
Dressing	0.96
Motor difficulties	0.88
Emotional care	0.88
Diabetes control	0.92
Self-care and care measures after discharge	0.97
Adaptation to the prosthesis	0.94
Referral	1

Source: The authors ,2020.

A total of 33 clinical nurses took part in the validation by the target population stage. The participants evaluated the organization, writing style, appearance and motivation domains, based on an agreement level $\geq 80\%$. Table 3 shows the categories corresponding to validation of the instrument by the target population, as well as the agreement index. According to the target population, the instrument proved to be valid in terms of semantics.

Table 3 – Agreement index in the evaluation by the target population Recife, PE, Brazil, 2020

CATEGORIES	AGREEMENT INDEX (%)
Organization	96
Writing style	95
Appearance	97
Motivation	90
OVERALL AGREEMENT INDEX	94

Source: The authors ,2020.

DISCUSSION

Care protocols are organized guidelines based on the literature that emphasize crucial aspects in the patient care process, i.e., they represent what needs to be performed while providing care to patients¹⁶.

The need was identified to develop individualized care protocols for Nursing professionals during care for patients amputated due to diabetic complications; furthermore,

the importance of validating these protocols as tools to customize and standardize Nursing care was revealed¹⁷. The Nursing care protocol for patients amputated due to diabetic complications was developed due to the need to standardize/unify care by means of a scientifically validated instrument.

Corroborating with the above, a research study that assessed nurses' perspectives in the treatment of patients amputated due to diabetic complications in eight hospitals from Spain and Portugal evidences that individuals amputated due to diabetic complications become physically and psychologically vulnerable¹⁷. Care based on the biological, psychological and social aspects is necessary. The authors emphasize the need for a multidisciplinary approach to these patients. Therefore, the protocol indicates the need for assessment and referral to other health professionals, such as nutritionist, physiotherapist and psychologist, in order to provide the recommended multiprofessional care.

The other aspects addressed in the protocol, such as patient's identification data, pain management, stump, dressing, motor difficulties, emotional care, self-care and care measures after discharge, adaptation to the prosthesis and referral, are listed in the literature¹⁵⁻²⁰. Pain is a frequent problem in the aforementioned population segment; however, few research studies address the semiology and targeted Nursing care, thus limiting professional care²¹. The protocol addresses this domain when investigated and treated in a particular way. The last component of the protocol encompasses referral of the patients to other services, according to each patient's needs.

The importance of standardization in the readaptation process of the researched population is verified. Nursing professionals should provide appropriate care to patients through referral and counter-referral, as shown in a research study found in the literature that aimed at identifying referral and counter-referral activities of amputated individuals in the city of Florianópolis, Brazil¹⁸.

It is worth noting a research study in which a protocol was prepared to direct nurses for performing the red reflex test in children during growth and development consultations in basic health units from the state of Rio Grande do Norte, Brazil. The authors indicate that production of the protocol represented a challenge due to the scarcity of updated articles on the theme, which demanded a search for other sources to produce the technology²². It is noticed that, in this research, the difficulty elaborating the protocol was also evidenced, as the studies found reported fragmented Nursing care, based on the biomedical model that only sees the patients by parts, not treating them as a whole.

Elaboration of the protocol needs to be associated with the patients' requirements and with the particularities of the treatment. Participation of the professionals in production of this instrument improves adherence and the success level in its implementation process²³. It is noted that such participation in production of the protocol was through the validation process, conducted both by the evaluators and by the target population.

Validation studies address analysis measures to verify the most appropriate writing style to be employed when producing the instrument; thus, the results collaborate to the analysis of improvements in the health measures and can define changes in care actions²⁴.

The validation stage proved to be a challenge due to the difficulty finding specialists on the theme and to the delay in filling out the validation instrument via email. This stage also represented a challenge in a research study conducted in Brazil with the participation of 15 evaluators with the purpose of validating the content of a Nursing intervention checklist for the angioplasty pre-operative period. In the research, the authors refer to the difficulty finding evaluators to comprise the sample²⁵.

In content validation by the evaluators, all the items reached the CVI recommended in the individual analysis: ≥ 0.70 . The instrument also presented an adequate CVI (0.94), where ≥ 0.80 is the recommended value for overall validation. Therefore, representativeness of the protocol and the evaluators' agreement regarding validity of the material are verified.

The CVI was also used in previous methodological research studies to determine validity of the instruments elaborated, which also reached an adequate CVI: ≥ 0.80 ²⁵⁻²⁷.

With regard to validation by the target population, the protocol was positively assessed, as all items analyzed obtained an agreement index $\geq 80\%$, which enabled establishing that instrument validation by the target population was achieved. The suggested changes, both in instrument content and face, were crucial because they improved the protocol writing style and appearance, which will encourage Nursing professionals to use the tool. Changes related to face and content were also identified in the other research studies, which was useful to improve the instrument²⁸.

Nursing care provision to the patients should offer safety during the assistance, as well as result in positive results due to the care measures applied, reducing pain and suffering. Therefore, it is pointed out that Nursing should promote health actions in a holistic way at all care level²⁹. Standardization of the care provided to patients amputated due to diabetic complications by means of a validated protocol will systematize Nursing care and guide scientific evidence-based professional practice.

Regarding the public health policies, the Health Care Network in the SUS devoted to chronic conditions stands out. There is an evident need to apply the SUS principles and guidelines in the health care activities³⁰. Using the tool elaborated in this research in the care provided to people with chronic diseases, more specifically to people amputated due to diabetic complications, involves the application of some principles, such as comprehensiveness, as the protocol provides for comprehensive patient care, meeting the need for multiprofessional care.

The research evidences the development of a new tool to improve Nursing care for people amputated due to DM, addressing the necessary demands and having implications on the professional practice. It was also verified that development of this research encouraged the capacity to deepen knowledge on issues related to clinical Nursing care, in addition to health education for the provision of comprehensive care to the target population, based on instruments with scientific evidence.

In relation to management, application of the protocol by Nursing professionals will promote knowledge on the tool developed and a possible investment on its use, in order to reduce expenses with complications/hospitalizations due to DM.

As for the study limitation, it is noted that, due to the time proposed for conduction of the research, it was not possible to evaluate the instrument with regard to its clinical applicability, an essential stage in methodological research. It is suggested that future research studies assess clinical applicability of the instrument, which will be the objective of the doctoral research by the author of the protocol, by means of a clinical trial to be conducted in the hospitals participating in this research. Another important factor related to the limitation lies in the data collection phase, which would initially be conducted in-person at the participating hospitals. However, due to the COVID-19 pandemic it was necessary to change the strategy and collection was performed at a distance.

CONCLUSION

Development of this research allowed elaborating and validating a Nursing care protocol for people amputated due to diabetic complications based on the literature, addressing domains that are cross-sectional to the comprehensive care approach. Both the evaluators and the target population validated the instrument. It presented CVI = 0.94 in the validation by the evaluators, and an agreement index $\geq 80\%$ in the validation by the target population. Therefore, the protocol stands out as a valid tool to apply it in the

Nursing care practice.

This research shows to be relevant for the provision of comprehensive and humanized care, encouraging autonomy and assisting in the rehabilitation process, in addition to promoting a reflection on the standardization and customization of Nursing care provided to individuals amputated due to diabetic complications, thus motivating the production of scientifically validated instruments to improve care delivered by Nursing professionals.

ACKNOWLEDGMENT

We would like to thank Coordenação de Aperfeiçoamento de Pessoal de Nível Superior (CAPES) for their financial support through the study grant. Code: 05740858313.

REFERENCES

01. Silva Filho JP, Andrade SG, Lima T de FS, Name KPO. Os cuidados de enfermagem junto ao paciente com o pé diabético. ReBIS [Internet]. 2019 [acesso 2020 Nov 12];1(3):6-11. Disponível em: <https://revistarebis.rebis.com.br/index.php/rebis/article/view/36>.
02. Marques ADB, Silva LMS da, Moreira TMM, Torres RAM. Associação entre internação hospitalar por diabetes mellitus e amputação de pé diabético. Enfermería Global. [Internet]. 2018 [acesso 02 set 2019];1(51):248-257. Disponível em: <https://doi.org/10.6018/eglobal.17.3.286181>.
03. Sociedade Brasileira de Diabetes. Diretrizes da Sociedade Brasileira de Diabetes 2019-2020. São Paulo: Clannad; 2020.
04. Scain SF, Franzen E, Hirakata VN. Effects of nursing care on patients in an educational program for prevention of diabetic foot. Rev Gaúcha Enferm. [Internet]. 2018 [acesso 02 set 2019];39(e20170230):01-08. Disponível em: <https://doi.org/10.1590/1983-1447.2018.20170230>.
05. Santos BK dos, Luz SCT da, Santos KB dos, Honório GJ da S, Farias G de O. Atuação de equipe multiprofissional no atendimento à pessoa amputada: contextualizando serviços e protocolos hospitalares. Cad. Bras. Ter. Ocup. [Internet]. 2018 [acesso 2020 Nov 13];26(3):527-537. Disponível em: <https://doi.org/10.4322/2526-8910.ctoAO1193>.
06. Silveira D de M, Ferreira LV, Fraga GHWS, Sousa IS de, Costa MB. Pé diabético: onde podemos intervir? HU Revista. [Internet]. 2017 [acesso em 13 nov 2020];43(1):13-18. Disponível em: <https://doi.org/10.34019/1982-8047.2017.v43.2589>.
07. Pimenta CA de M, Pastana ICASS, Sichieri K, Soalha RKT, Souza W. Guia para construção de protocolos assistenciais de enfermagem [Internet]. São Paulo: COREN-SP; 2017 [acesso em 20 ago 2019]. 50 p. Disponível em: <http://biblioteca.cofen.gov.br/wp-content/uploads/2016/06/Guia-para-Constru%C3%A7%C3%A3o-de-Protocolos-Assistenciais-de-Enfermagem.pdf>.
08. Lima NKG de, Fernandes MRCC, Silva JC da, Silva AFR, Coura AS, França ISX de. Effectiveness of patient-directed nursing protocols with diabetic complications. R. pesq.: cuid. fundam. Online. [Internet]. 2021 [acesso em 21 ago 2019];1(13):685-691. Disponível em: <https://doi.org/10.9789/2175-5361.rpcfo.v13.9449>.
09. Polit DF, Beck CT. Fundamentos de pesquisa em enfermagem. 7. ed. Porto Alegre: Artmed; 2011.
10. Pasquali L. Princípios de elaboração de escalas psicológicas. Rev Psiq Clin. [Internet]. 1998 [acesso em 16 set 2019];25(5):206-213. Disponível em: <https://document.onl/documents/pasquali-principios-de>

elaboracao-de-escalas-psicologicas.html.

11. Pasquali L. Validade dos testes psicológicos: será possível reencontrar o caminho? *Psic. Teor. e Pesq.* [Internet]. 2007 [acesso em 16 set 2019];23(esp):99-107. Disponível em: <https://doi.org/10.1590/S0102-37722007000500019>.
12. Brasil. Ministério da Saúde. Secretaria de Atenção à Saúde. Departamento de Ações Programáticas Estratégicas. Diretrizes de atenção à pessoa amputada. 2. ed. Brasília: Ministério da Saúde, 2014.
13. Alexandre NMC, Coluci MZO. Validade de conteúdo nos processos de construção e adaptação de instrumentos de medidas. *Ciênc. saúde coletiva*. [Internet]. 2011 [acesso em 22 ago 2019];16(7):3061-3068. Disponível em: <https://doi.org/10.1590/S1413-81232011000800006>.
14. Fehring RJ. The Fehring model. In: Carroll-Johson, P. Classification of nursing diagnosis: proceedings of the tenth conference of North American Nursing Diagnoses Associations. Philadelphia: JB Lippincott; 1994. p. 55- 57.
15. Ribeiro L da CC, Oliveira TC, Moreira SA, Paula FA de. Construction and validation of manual on burnout in teachers. *Recom.* [Internet]. 2017 [acesso 2019 Ago 22];1(e1317):01-09. Disponível em: <https://doi.org/10.19175/recom.v7i0.1317>.
16. Silva JASV, Hinrichsen SL, Brayner KAC, Vilella T de AS, Lemos MC. Glosas hospitalares e o uso de protocolos assistenciais: revisão integrativa da literatura. *Rev. Adm. Saúde*. [Internet]. 2017 [acesso em 02 set 2019];17(66):01-17. Disponível em: <https://cqh.org.br/ojs-2.4.8/index.php/ras/article/view/13/24>.
17. Font-Jimenez I, Acebedo-Uridales MS, Aguaron-Garcia MJ, Sousa MR de, Rubio-rico L. Nurses' perspective of treating patients with an amputation due to diabetic foot syndrome. *Clin. Nurse Spec.* [Internet]. 2020 [acesso em 02 set 2019];04(13):107-115. Disponível em: <https://doi.org/10.1097/NUR.0000000000000519>.
18. Ferreira ML, Vargas MA de O, Marques AMFB, Huhn A, Andrade SR de, Vargas CP. Nursing actions in reference and counter-reference. In: Health care for persons with amputation. *Cogitare Enferm.* [Internet]. 2017 [acesso em 02 set 2019];22(3):01-09. Disponível em: <http://dx.doi.org/10.5380/ce.v22i3.50601>.
19. Schreiber ML. Lower limb amputation: postoperative nursing care and considerations. *Medsurg Nursing*. [Internet]. 2017 [acesso em 02 set 2019];26(4):274. Disponível em: <https://www.proquest.com/openview/a6b3568c1f8884885afd8daf86d918b9/1?pq-origsite=gscholar&cbl=30764>.
20. Webster JB, Crunkhorn A, Sall J, Highsmith MJ, Pruziner A, Randolph BJ. Clinical practice guidelines for the rehabilitation of lower limb amputation. *Am. J. Phys. Med. Rehabil.* [Internet]. 2019 [acesso em 02 nov 2019];98(9):820-829. Disponível em: <https://doi.org/10.1097/PHM.0000000000001213>.
21. Estevão MC, Miranda C, Pereira APGS, Souza E das N de, Pereira RSF, Ribeiro CF, et al. Dor fantasma em pacientes submetidos à amputação: revisão integrativa. *Medicus*. [Internet]. 2020 [acesso 2019 nov 20];2(2):1-5. Disponível em: <http://doi.org/10.6008/CBPC2674-6484.2020.002.0001>.
22. Araújo ABS de, Oliveira DA de. Protocolo para teste do reflexo vermelho: utilização em consultas de crescimento e desenvolvimento. *Enferm. Actual Costa Rica*. [Internet]. 2020 [acesso em 20 nov 2019];01(38):01-15. Disponível em: <https://doi.org/10.15517/revenf.v0i38.36990>.
23. Stuque AG, Sasaki VDM, Teles AA da S, Santana ME de, Rabeh SAN, Sonobe HM. Protocol for prevention of pressure ulcer. *Rev Rene*. [Internet]. 2017 [acesso em 20 nov 2019];18(2):272-82. Disponível em: <https://doi.org/10.15253/2175-6783.2017000200018>.
24. Echevarría-Guanilo ME, Goncalves N, Romanoski PJ. Psychometric properties of measurement instruments: conceptual bases and evaluation methods - Part I. *Texto Contexto Enferm.* [Internet]. 2017 [acesso 2019 nov 20];26(4):01- 11. Disponível em: <https://doi.org/10.1590/0104-07072017001600017>.
25. Girondi JBR, Bússolo P, Rosa LM da, Amante LN, Sebold LF, Gelbeck FL, et al. Validação de conteúdo de checklist de intervenções de enfermagem pré-operatórias para angioplastia. *Enferm. Foco* [Internet].

2020 [acesso 2019 nov 20];11(2):11-17. Disponível em: <http://revista.cofen.gov.br/index.php/enfermagem/article/view/2752/761>.

26. Sena JF de, Silva IP da, Lucena SKP, Oliveira AC de S, Costa IKF. Validation of educational material for the care of people with intestinal stoma. Rev. Latino-Am. Enfermagem. [Internet]. 2020 [acesso em 21 nov 2019];28(e3269):01-09. Disponível em: <http://dx.doi.org/10.1590/1518-8345.3179.3269>.

27. Usero-Pérez M del C, Jiménez-Rodríguez ML, González-Aguña A, González-Alonso V, Orbañanos-Peiro L, Santamaría-García JM, et al. Validation of an evaluation instrument for responders in tactical casualty care simulations. Rev. Latino-Am. Enfermagem. [Internet]. 2020 [acesso em 21 nov 2019];28(:e3251):01-09. Disponível em: <http://dx.doi.org/10.1590/1518-8345.3052.3251>.

28. Silva RDN da, Rosa LM da, Radunz V, Cesconetto D. Evaluation and classification of vaginal stenosis in brachytherapy: instrument content validation for nurses. Texto Contexto Enferm. [Internet]. 2018 [acesso 2019 nov 21];27(2):02- 12. Disponível em: <https://doi.org/10.1590/0104-070720180005700016>.

29. Rezende KCP, Monteiro Neta AM dos S, Oliveira ITM de, Tavares PAB, Veras LLJ, Nascimento G de OB do. Cuidados de enfermagem aplicados à um paciente com úlcera venosa crônica: relato de caso. Braz. J. Hea. Rev. [Internet]. 2020 [acesso em 21 nov 2019];3(4)10662-10673. Disponível em: <https://doi.org/10.34119/bjhrv3n4-327>.

30. Borges D de B, Lacerda JT de. Actions aimed at the diabetes mellitus control in primary health care: a proposal of evaluative model. Saúde debate. [Internet]. 2018 [acesso 2019 nov 21];42(116):162-178. Disponível em: <https://doi.org/10.1590/0103-1104201811613>.

*Article extracted from the master's/PhD thesis "Construção e validação de protocolo de cuidados de enfermagem a pessoa com amputação por complicações diabéticas", Universidade Estadual da Paraíba, Campina Grande, PB, Brasil, 2020.

Received: 01/02/2022

Approved: 23/06/2022

Associate editor: Dra. Luciana Nogueira

Corresponding author:

Nalva Kelly Gomes de Lima

Universidade Estadual da Paraíba

R. Baraúnas, 351 - Universitário, Campina Grande - PB, Paraíba, 58429-500, Brasil.

E-mail: nalvakellygomes@gmail.com

Role of Authors:

Substantial contributions to the conception or design of the work; or the acquisition, analysis, or interpretation of data for the work - Lima NKG de, Silva JC da, Rebouças CB de A, Coura AS, França ISX de; Drafting the work or revising it critically for important intellectual content - Lima NKG de, Rebouças CB de A, Coura AS, Félix ND de C; Agreement to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved - Lima NKG de. All authors approved the final version of the text.

ISSN 2176-9133



This work is licensed under a [Creative Commons Attribution 4.0 International License](https://creativecommons.org/licenses/by/4.0/).