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Rua Cassiano Branco 74, 4º Esq Tras 4250 - 084 Porto - www.aper.pt

E-mail: revista@aper.pt | Telephone: 931756382

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Associação Portuguesa dos Enfermeiros de Reabilitação

40 ANOS 1978 - 2018

FOREWORD

In 1969, Nurse José Pacheco dos Santos started the Portuguese Society of Rehabilitation Nurses. Nine years later, on December 20, 1978, this Society became the current Portuguese Association of Rehabilitation Nurses (*Associação Portuguesa dos Enfermeiros Especializados em Enfermagem de Reabilitação* - APER), which this year celebrates its 40th anniversary. He was undoubtedly a man of great vision when initiated an Organization that has remained active throughout all these years, under the same statutory principles. It clearly deserves gratitude from all of us.

APER has managed to keep alive the spirit of these professionals, who, through their practice, have contributed to society in general by recognizing them more and more, as professionals of excellence who contribute every day to improving people's Quality of Life.

Experiencing these last years of APER has been a unique experience!

The proximity to highly qualified nurses who voluntarily sacrifice a large part of their time and family in favor of the Association has allowed rehabilitation to be taken to various national and international spheres, leaving a heritage that must be respected and energized. All lives are made of history and this is ours that makes us very proud.

Keeping the objectives always present, throughout this middle age, we celebrate by paying homage to all the professionals who made up the Association in the name of their Presidents.

We created the Sales Luís Award which aims to recognize all initiatives for the dissemination and expansion of Rehabilitation Nursing. We launched the Portuguese Journal of Rehabilitation Nursing to stimulate scientific evolution and we implemented a Repository of Rehabilitation Nursing open to everyone, to register scientific works.

People will always be our greatest asset sharing this trip with us and offering the world with their capabilities:

- thinking outside the “box”;
- identifying different ways of doing things;
- turning ideas into something useful and executable;
- having a vision beyond the obvious;
- acting on the assumption that opportunities are essentially a matter of choice;
- moving and progressing in unfamiliar territories.

It is not only the Association that has to be congratulated, but also all the Rehabilitation Nurses.

Thank you so much for helping us and especially those ones who need us most.

I leave you a challenge: “We are Happier to Act than to React” (Catalão, 2014).

Farewell!

RN. ISABEL RIBEIRO,

President of the Portuguese Association of Rehabilitation Nurses



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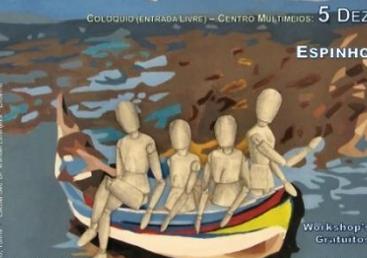
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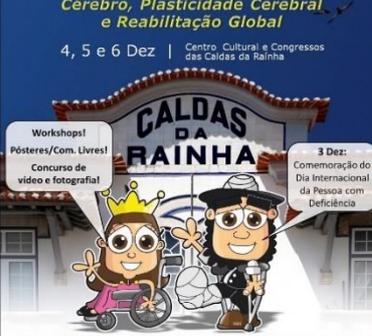
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Pacheco dos Santos



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3º 30/03/1984

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4º 18/03/1989

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5º 04/04/1992

Maria Margarida de Oliveira
Sousa Ribas de Matos



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9º 21/01/2012

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EDITORIAL

DOI 10.33194/rper.2018.v1.n2.e Submitted: 2018-12-01 / Accepted: 2018-12-02 / Published: 2018-12-06

The path to be followed by nurses in the reinforcement of specific knowledge in rehabilitation requires a great participation in the dissemination of studies, practices, and sustained reflections in order to ensure that rehabilitation nursing has particularities, which certify a differentiated practice based on knowledge.

In Portugal, it is expected that rehabilitation nurses have Differentiated Skills, i.e., knowledge, skills and attitudes that respond to the needs in the various fields of intervention, adding expertise and the development of knowledge in an area to the nurses' skills of differentiated intervention that does not conflict with the common and specific competences of the specialist nurse (Regulation no. 556/2017).

It is important that the understanding of our role as a specialist nurse does not abandon the guidelines for a practice beyond the technical executions that require specialized knowledge, such as: caring for people with special needs, throughout the life cycle, in all contexts of care practice; training the person with a disability, activity limitation and/or participation restriction for the reinsertion and exercise of citizenship; maximizing functionality by developing the person's abilities (article 4, Regulation no. 125/2011).

Progressing on the knowledge in rehabilitation nursing leads to a wealth of problems that we must reflect or investigate far beyond the day-to-day we experience, it is a challenge where we have to incorporate the common competences of specialists, meaning, the ethical and legal aspects, continuous improvement (quality and safety) and particularly care management, but in a strict relationship with the rehabilitation of people.

In a flash about the short journey, we could say that it is necessary to encourage each rehabilitation specialist not to close on himself, but to bring to public his experience of reflection on practices or research, as some colleagues have done. In this number, we have ten published works, where we can find four areas of impact for the intervention of nurses, presenting methodological studies, close proximity studies with particularly neurological and cardiorespiratory diseases, as well as works centered on people in need of rehabilitation and, finally, articles centered on the profession.

As we read what rehabilitation nurses investigate, or are concerned about, we have the delimitation of specialized knowledge and approaching to a reality where we have to add leadership in the cases we intervene, an intense force on a work that allows promoting a successful life for the people we care for, in addition to technical interventions that ensure independence and empowerment to be peers in the teams where we work.

As diving into an endless ocean that constitutes the interventions of rehabilitation nurses, we find here and there in the writings the strategies to intervene in people with disabilities, but also in caregivers and families, the emergence of the resource of evidence to support decisions and the concern with the quality of life of those we care for.

A challenge for each reader is the ability of each one to read beyond the lines presented in the articles, as they are just a summary of what the authors understood to be significant to share with everyone and the reviewers validated that they were useful ideas and consistent results to be part of the body of our magazine.

PHD PROFESSOR MARIA MANUELA MARTINS

Coordinating Professor at the School of Nursing. Member of the Research Group - NursID: Innovation and Development in Nursing - CINTESIS - center for health technology and services research - FMUP. Professor at the Master's Degree in Rehabilitation Nursing, Coordinator of the Master's Degree in Management and Head of Nursing Services. Member of the Scientific Committee of the Doctorate in Nursing Sciences at UP.



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A IMPORTÂNCIA DA ENFERMAGEM DE REABILITAÇÃO NAS UNIDADES DE CUIDADOS INTENSIVOS PORTUGUESAS

LA IMPORTANCIA E LA ENFERMERÍA DE REHABILITACIÓN EN LAS UNIDADES DE CUIDADOS INTENSIVOS PORTUGUESAS

THE IMPORTANCE OF REHABILITATION NURSING IN THE PORTUGUESE INTENSIVE CARE UNITS

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Roberto Miguel Gonçalves Mendes^{1,2}; Manuel Lourenço Nunes^{1,2}

1 - Faculdade de Ciências da Saúde, Universidade da Beira Interior, Portugal; 2 - Unidade Local de Saúde de Castelo Branco

RESUMO

Objetivo: Conhecer a importância da Enfermagem de Reabilitação nas unidades de cuidados intensivos (UCI's) portuguesas.

Métodos: Análise secundária do inquérito nacional de avaliação da organização dos cuidados de reabilitação, nas unidades de cuidados intensivos portuguesas.

Resultados: Em Portugal há 2.9 enfermeiros por unidade, com formação especializada em reabilitação por unidade. Este valor aumenta nas unidades em que a reabilitação tem por base um modelo misto e diminui nas unidades que recorrem a equipas externas especializadas. 40% destes profissionais não desempenham funções na sua área de especialização e apenas 26.4% desempenham funções a tempo inteiro. As unidades com enfermagem de reabilitação a tempo inteiro efetuam mais frequentemente a avaliação da condição física na alta (38.7 versus 8.9%), contudo não há participação destes profissionais na avaliação pós-alta em nenhuma UCI. Não são observáveis diferenças nos resultados assistenciais entre as UCI que integram enfermeiros de reabilitação e as que não o fazem.

Conclusão: Os enfermeiros com especialidade em enfermagem de reabilitação estão presentes na maioria das UCI's nacionais e constituem uma peça importante nos cuidados prestados.

Palavras chave: enfermagem de reabilitação; cuidados intensivos; organização e administração

RESUMEN

Objetivo: Conocer la importancia de la rehabilitación de enfermería en las unidades de cuidados intensivos (UCI's) portuguesas.

Métodos: Análisis secundaria del estudio nacional para evaluar la organización de la atención de rehabilitación en unidades de cuidados intensivos portuguesas.

Resultados: En cada UCI portuguesa hay 2.9 enfermeras con formación especializada en rehabilitación. Este valor aumenta en las unidades en que la rehabilitación se basa en un modelo mixto y disminuye en las unidades que recurren a equipos externos especializados. 40% de estos profesionales no desempeñan funciones en su área de especialización y sólo el 26.4% desempeñan funciones a tiempo completo. Las unidades con enfermería de rehabilitación a tiempo completo efectúan más a menudo la evaluación de la condición física en el alta (38.7 frente al 8.9%), sin embargo no hay participación de estos profesionales en la evaluación post alta en ninguna UCI. No se observan diferencias en los resultados asistenciales entre las UCI que integran enfermeros de rehabilitación y las que no lo hacen.

Conclusión: Los enfermeros con especialidad en enfermería de rehabilitación están presentes en la mayoría de las UCI nacionales y constituyen una pieza importante en los cuidados prestados.

Palavas clave: enfermería en rehabilitación; cuidados críticos; organización y administración

ABSTRACT

Objective: To know the importance of Rehabilitation Nursing in Portuguese Intensive Care Units (ICUs).

Methods: Secondary analysis of the national evaluation survey of the organization of rehabilitation care in Portuguese intensive care units.

Results: In Portugal there are 2.9 nurses per unit, with specialized training in rehabilitation. This value increases in units where rehabilitation is based on a mixed model and decreases in units that resort to specialized external teams. 40% of these professionals do not perform functions in their area of specialization and only 26.4% perform full-time functions. Units with full-time rehabilitation nursing more frequently assess the physical condition at discharge (38.7 versus 8.9%); however, these professionals do not participate in the post-discharge evaluation in any ICU. There are no observable differences in care outcomes among ICUs that are part of rehabilitation nurses and those who do not.

Conclusion: Nurses with a specialty in rehabilitation nursing are present in most of the national ICUs and are an important part of the care provided.

Keywords: rehabilitation nursing; critical care; organization and administration

INTRODUCTION

In most developed countries, rehabilitation is part of the care provided to people in critical situations, and its importance is particularly recognized in early mobilization, a safe and beneficial practice that should be a priority in this context.⁽¹⁾

As a rule, mobilization and other rehabilitation techniques are mostly carried out by physiotherapists integrated into the team or on call, depending on the country under analysis.^(2,3) In Portuguese intensive care units, physiotherapy is mostly carried out on call by the intensive care physician, however nurses with specialized training in rehabilitation, commonly referred to as rehabilitation nurse (RN), also take part in the rehabilitation process.⁽⁴⁾ This specialization in nursing emerged in Portugal in the 60^{'s} based on the North American model. Initially, specialists were trained for the Alcoitão Physical Medicine and Rehabilitation Center and later, the increase in the number of RNs allowed them to integrate rehabilitation or respiratory kinesitherapy services and also to integrate primary health care and hospital services, without having a homogeneous distribution based on the needs of this specialized care.⁽⁵⁾

According to the Order of Nurses, *“the rehabilitation nurse designs, implements and monitors differentiated rehabilitation nursing plans, based on people’s real and potential problems. (...) their intervention aims (...) to ensure the maintenance of the clients’ functional capacities, to prevent complications and avoid disabilities, as well as to provide therapeutic interventions aimed at improving residual functions, maintaining or regaining independence in life activities (...)”*. The rehabilitation nursing specialist intervenes above all *“at the level of neurological, respiratory, cardiac, orthopedic functions”*⁽⁶⁾, fitting into what the critically ill patient’s rehabilitation care needs will be.⁽⁷⁻⁹⁾

These nurses are dispersed throughout almost all units, even though, due to lack of resources or management options, they do not always perform functions within the area of specialization. Even so, we can find RNs integrated in the multidisciplinary team of ICUs or integrated in specialized teams that go to the units to provide rehabilitation care, as part of a heterogeneous organization based on 3 base models:⁽⁴⁾

1. Internal model - rehabilitation care provided by the unit’s team, present in about 23% of the units;
2. External model - rehabilitation care provided by a specialized external team, present in 25% of the units;
3. Mixed Model - rehabilitation care provided by the unit’s team in conjunction with care provided by an external team, in a mixture of the previous models, the most common situation covering 52% of the units.

In this context, the RN is present in all units that use the internal model and in about 19% of the specialized external teams that provide rehabilitation care to critically ill patients.⁽⁴⁾

In this issue, we intend to analyze this information in more detail in order to understand the importance of Rehabilitation Nursing in Portuguese Intensive Care Units. The research question asked was: What is the importance of rehabilitation nurses in the care of critically ill patient, adult, in Portugal? The specific objectives of this work are:

- Determining the availability of nurses with specialized training in rehabilitation in Portuguese ICUs;
- Assessing the rate of use of these professionals to perform specialized functions in the area of rehabilitation;
- Assessing whether the number of rehabilitation nurses in each unit is related to the organization of rehabilitation care;
- Determining the participation of rehabilitation nurses in the mobilization of critically ill patients;
- Assessing the influence of the presence of rehabilitation nurses on assisted care outcomes;
- Assessing the participation of rehabilitation nurses in possible patient assessments after discharge from the ICU.

METHODS

It is a secondary analysis of the national survey to assess the organization of rehabilitation care in Portuguese intensive care units. The study was conducted between November 2016 and March 2017, through an online survey of Head Nurses or Responsible Nurses of the 58 adult ICU’s that integrate the Portuguese Society of Intensive Care database. The survey consisted on a total of 28 questions, grouped into: institution characterization, unit characterization, team characterization, rehabilitation care organization, availability of resources and results.⁽⁴⁾

Statistical analysis was performed using the program IBM SPSS Statistics version 22. Regarding descriptive statistics, frequencies, percentages, means and standard deviations were calculated.

The Chi-Square test was used to compare the distribution of the number of RNs according to the different models of organization of rehabilitation care and to compare the assessment of physical condition at discharge between ICUs with and without RNs.

The comparison of care results was performed using the Mann-Withney test for independent samples.

A significance level of 0.05 was used.

Study approved by the Ethics Committee of the University of Beira Interior (Opinion CE-FCS-2016-028).

RESULTS

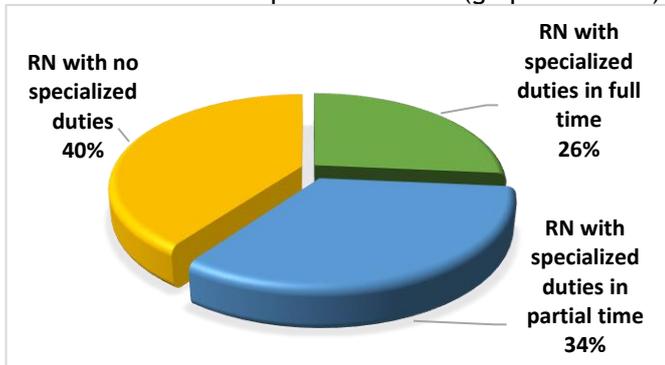
Forty-eight valid surveys were obtained for 42 medical-surgical or multipurpose units, 3 neurosurgical units and 2 cardiothoracic units (1 survey does not mention the type of unit). These units represent a total of 399 intensive care beds and 132 intermediate care beds.

Availability of nurses trained in rehabilitation

A unit integrates in its team, on average, 31.6 ± 14.7 nurses, of which around 9.6% have specialized training in rehabilitation nursing. These ICUs include a total of 140 nurses with this type of specialization, on average 2.9 ± 1.8 nurses per unit.

- 93.8% of units have nurses with specialized training in rehabilitation in their team;
- 75.0% of the units have nurses with specialized training in rehabilitation in specialized functions;
- 45.8% of the units have nurses with specialized training in rehabilitation that are performing full-time specialized functions.

In absolute terms, 60% of nurses with specialized training perform specialized functions, 26.4% full-time and 33.6% part-time (graphic 1).



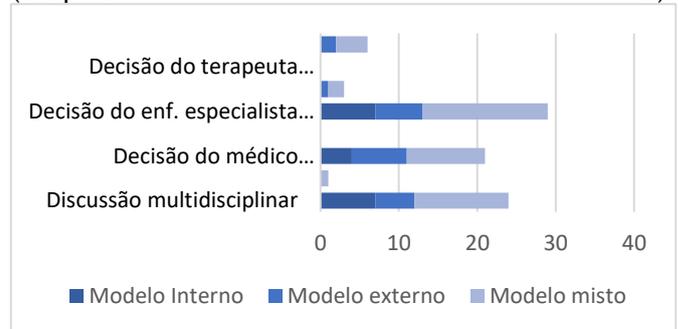
Graphic 1. Time to perform specialized functions.

Analyzing the distribution of the number of RNs according to the different models of organization of rehabilitation care (Table 1), we find that, in average terms, it is in the mixed model (articulation of the rehabilitation care provided by the ICU team with specialized external teams) that there is a greater number of nurses with specialized training in rehabilitation per ICU (3.6 ± 2.0 nurses/unit). In contrast, units where rehabilitation care is provided by external teams are those that have fewer RNs in their team (1.58 ± 1.17).

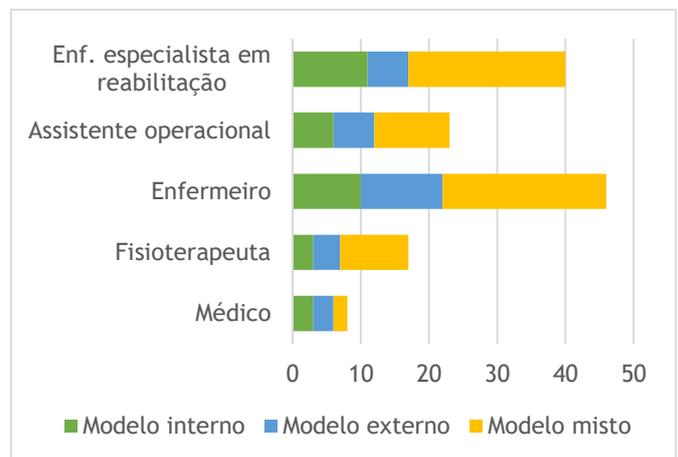
In addition to the RNs integrated in the intensive care teams, in 10 units (about 17%) these professionals are part of the external teams that provide rehabilitation care in these services.

Participation in the mobilization and entry of patients

In addition to the rehabilitation activities carried out in bed, the RNs, regardless of the model of organization of rehabilitation care, are generally the promoters of the mobilization of patients out of bed (Graphic 2) and actively participate in this procedure, usually in conjunction with the caregiver nurse (Graphic 3).



Graphic 2. How the decision to mobilize patients out of bed is made



Graphic 3. Elements that usually participate in the mobilization of patients out of bed

Influence in the results

Out of the 48 units under analysis, only 19 reported the results related to length of stay, ventilation time and mortality rate. These results do not differ significantly because there are nurses with rehabilitation training in the team or because there are full-time RNs (Table 2).

Participation in discharge and post-discharge assessment

With regard to the assessment at discharge, only in about 22% of the units the functionality of the patients is assessed. However, there are significant differences

Organization model		Internal model	External model	Mixed model	Value of p
N° of nurses specialized in rehabilitation	Total	31	19	90	0.003
	(Average ± Standard deviation)	(2.82 ± 0.75)	(1.58 ± 1.17)	(3.60 ± 2.00)	
Number of full-time rehabilitation nurses	Total	14	3	20	0.096
	(Average ± Standard deviation)	(1.27 ± 1.42)	(0.25 ± 0.45)	(0.80 ± 0.96)	
Number of part-time rehabilitation nurses	Total	14	0	33	0.006
	(Average ± Standard deviation)	(1.27 ± 1.35)	(0.00 ± 0.00)	1.32 ± 1.60)	
Number of rehabilitation nurses who do not perform duties	Total	3	16	37	0.129
	(Average ± Standard deviation)	(0.27 ± 0.46)	(1.33 ± 1.37)	(1.48 ± 2.20)	

Table 1. Analysis of the distribution of the number of RN according to the different models of organization of rehabilitation care

ICU with rehabilitation nurse		No	Yes	Value of p
Average length of stay (days)	N	2	26	0.894
	(Average ± Standard deviation)	7.45 ± 0.78	7.37 ± 2.33	
Average time of invasive ventilation (days)	N	0	20	
	(Average ± Standard deviation)		5.73 ± 2.69	
Mortality rate	N	1	23	1.000
	(Average ± Standard deviation)	21.00 ± - -	20.79 ± 6.21	
ICU with full-time rehabilitation nurse		No	Yes	Value of p
Average length of stay (days)	N	16	12	0.347
	(Average ± Standard deviation)	7.65 ± 2.23	7.02 ± 2.32	
Average time of invasive ventilation (days)	N	11	9	0.370
	(Average ± Standard deviation)	6.43 ± 2.24	4.87 ± 3.07	
Mortality rate	N	13	11	0.228
	(Average ± Standard deviation)	19.51 ± 4.95	22.32 ± 7.12	

Table 2. Comparison of care outcomes between units with and without rehabilitation nurses

between units that have full-time RN and those ones that do not have nurses in these conditions ($X^2(2) = 5,373$; $p = 0.020$; $N = 41$), with the first ones to perform this type of assessment more frequently (38.7 versus 8.9%).

The numbers of assessments after discharge are slightly lower, with only 12.5% of units reporting perform this type of follow-up, and even so, in a very different way. The participation of specialist nurses in rehabilitation in this evaluation was not mentioned.

DISCUSSION

Nurses with a specialization in rehabilitation nursing are present in most of national ICUs, an unparalleled situation internationally⁽¹⁰⁾. In addition to the work they develop with patients, taking the initiative to start the rehabilitation process early and developing a appropriate plan to the patient's condition, ⁽⁴⁾ these professionals promote, as evidenced in this analysis, the mobilization of patients out of bed, meeting the guidelines that advocate early mobilization of these patients.⁽¹¹⁾

In addition to the clinical work, research projects are developed in specific areas of rehabilitation for critically ill patients, namely at the respiratory level,

(12-16) motor (17) and also in the promotion of autonomy⁽¹⁸⁾ and in the competences to care for the person with dependence on self-care⁽¹⁹⁾. This development seems to be closely related to the creation of a master's courses in rehabilitation nursing, since most of the investigations were carried out in this context.

Although this article presents some traces of what is the intervention of rehabilitation nursing in intensive care units, we are convinced that we only present the tip of the iceberg and that researches in this area has high potential. It would be interesting to know in fact how early mobilization is and whether we comply with international recommendations, which has not always been seen in researches carried out in other countries.⁽²⁰⁻²²⁾ In this particular aspect, rehabilitation nursing could strengthen its position, as it is a sensitive context in which it is essential to master a set of very specific competences within the reach of the RNs. This statement also goes through the documentation of the practice and the indicators are the best tool. The Order of Nurses and the Rehabilitation Nursing Specialty College have already taken some steps in this direction, disclosing a set of indicators that are potentially sensitive to rehabilitation care.⁽²³⁾ Those that are most suitable and possibly complemented with some more indicators must be identified to this context.⁽²⁴⁻²⁶⁾ In order to develop this work, it will be important to increase the participation of RNs in the assessment of the physical condition of patients at discharge and post-discharge, and to monetize the 40% of nurses with specialized training who at that time did not perform functions in the area.

CONCLUSION

Nurses with a specialty in rehabilitation nursing are present in most national ICUs and constitute an important element in the care of critically ill patients, a unique situation in the international context. Its intervention involves developing individual care plans, including out-of-bed mobilization, and its activity is supported by a growing scientific production. At this moment, we do not have data that allow us to infer about the influence on care outcomes, in general, or more specifically on functionality or gains in self-care, targets of intervention in this specialty.

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ESCALA EATING ASSESSMENT TOOL 10 NA PESSOA COM ACIDENTE VASCULAR CEREBRAL

ESCALA EATING ASSESSMENT TOOL 10 EN LA PERSONA CON ACCIDENTE VASCULAR CEREBRAL

EATING ASSESSMENT TOOL 10 IN PEOPLE WITH STROKE

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Juan Luis Pozo Rosado¹; Ana Alexandra Simões Ribeiro Gomes²; Ana Catarina de Almeida Borlido de Paula³;
Ana Sofia Levita Antunes⁴; Luís Manuel Mota de Sousa^{5,6}

1 - Hospital Dr Fernando da Fonseca; 2 - Instituto Português de Oncologia de Lisboa;
3 - Centro Hospitalar Universitário Lisboa Central, Hospital de São José; 4 - Centro Hospitalar Lisboa Ocidental;
5 - Hospital Curry Cabral, Centro Hospitalar Universitário Lisboa Central; 6 - Escola Superior de Saúde Atlântica

RESUMO

Introdução: Com o Acidente Vascular Cerebral, surgem com frequência alterações da deglutição. O Eating Assessment Tool-10 é um instrumento que permite detetar precocemente a disfagia e a resposta ao tratamento.

Objetivo: Avaliar as propriedades métricas do Eating Assessment Tool-10 na pessoa com Acidente Vascular Cerebral com alteração da deglutição.

Método: Revisão Sistemática da Literatura baseada nas recomendações do Joanna Brigs Institute para a estratégia PICO, quais as propriedades métricas do Eating Assessment Tool-10 em pessoas com Acidente Vascular Cerebral com alteração da deglutição? A pesquisa foi realizada com recurso a plataformas de bases de dados eletrónicas EBSCO, Host, Google Escolar, Cochrane Lybrary Collection, Scielo e Proquest, tendo sido identificados, selecionados, avaliados na qualidade metodológica e incluídos os artigos de acordo com as recomendações PRISMA.

Resultados: Foram incluídos seis estudos que cumpriam os critérios de elegibilidade e de qualidade metodológica. Foram encontrados estudos sobre a reprodutibilidade, validade e responsividade do Eating Assessment Tool-10. Contudo, esta última propriedade necessita de ser estudada em futuras investigações. A limitação identificada foi na aplicabilidade da escala em pessoas com alterações cognitivas.

Conclusões: O Eating Assessment Tool-10 é um instrumento fiável, válido e com responsividade, nas pessoas com AVC com alterações da deglutição.

Descritores: Acidente Vascular Cerebral, Transtornos de Deglutição; Psicometria; Reprodutibilidade dos resultados; Enfermagem em Reabilitação.

RESUMEN

Introducción: Con el Accidente Vascular Cerebral, surgen con frecuencia alteraciones de la deglución. El Eating Assessment Tool-10 es un instrumento que permite detectar precozmente la disfagia y la respuesta al tratamiento. **Objetivo:** Evaluar las propiedades métricas del Eating Assessment Tool-10 en la persona con Accidente Vascular Cerebral con alteración de la deglución.

Método: Revisión Sistemática de la Literatura basada en las recomendaciones del Joanna Brigs Institute para la estrategia PICO, cuáles las propiedades métricas del Eating Assessment Tool-10 en personas con Accidente Vascular Cerebral con alteración de la deglución. La investigación se realizó utilizando plataformas de bases de datos electrónicas EBSCO, Host, Google Escolar, Cochrane Lybrary Collection, Scielo y Proquest., Habiendo identificado, seleccionados, evaluados en la calidad metodológica e incluidos los artículos teniendo en cuenta las recomendaciones PRISMA.

Resultados: Se incluyeron seis estudios que cumplían los criterios de elegibilidad y de calidad metodológica. Se han encontrado estudios sobre la reproducibilidad, validez y responsividad del Eating Assessment Tool-10. Sin embargo, esta última propiedad necesita ser estudiada en futuras investigaciones. La limitación identificada fue en la aplicabilidad de la escala en personas con alteraciones cognitivas.

Conclusiones: El Eating Assessment Tool-10 es un test fiable, válido y con responsividad, en las personas con AVC con alteraciones de la deglución.

Palabras clave: Accidente Vascular Cerebral; Trastornos de Deglución; Psicometría; Reproducibilidad de los resultados; Enfermería en Rehabilitación.

ABSTRACT

Background: Swallowing disorders often occur in Stroke. The Eating Assessment Tool-10 allows early detection of dysphagia and response to treatment.

Objective: To evaluate the metric properties of the Eating Assessment Tool-10 in the person with Stroke that presents swallowing disorders.

Method: Systematic Review of Literature based on the recommendations of the Joanna Brigs Institute for the PICO strategy, what are the metric properties of the Eating Assessment Tool-10 in people with Stroke that present a swallowing disorder? The research was carried out using the electronic database platforms: EBSCO, Host, Google Scholar, Cochrane Library Collection, Scielo and Proquest, having identified, selected, evaluated the methodological quality and included the articles that take into account the PRISMA recommendations.

Results: Six studies were included that fulfilled the eligibility and methodological quality criteria. Studies on the reproducibility, validity and responsiveness of the Eating Assessment Tool-10 were found. However, this last property needs to be studied in future investigations. The limitation identified was the applicability of the scale in people with cognitive alterations.

Conclusions: The Eating Assessment Tool-10 is a reliable, valid and responsive tool for people with stroke that present swallowing disorders.

Key words: Stroke; Psychometry; Deglutition Disorders; Reproducibility of results; Rehabilitation Nursing.

INTRODUCTION

Stroke is one of the leading causes of death and disability worldwide,⁽¹⁻³⁾ with a high prevalence globally.⁽³⁻⁴⁾

At the beginning of the 21st century, the age-standardized incidence of stroke in Europe ranged from 95 to 290/100,000 inhabitants per year, with one-month mortality rates ranging from 13 to 35%. Every year, approximately 1.1 million people in Europe have had a stroke.⁽⁵⁾

The impact of ischemic and hemorrhagic stroke increased significantly worldwide between 1990 and 2010, that is, the number of cases, number of deaths and disability-adjusted life years (DALYs) lost.⁽⁶⁾

Dysphagia is a common complication in people with stroke, but the estimates of its frequency vary considerably.⁽⁷⁾ It is an important cause of pneumonia in the first days after stroke, having a major impact on clinical outcomes, mortality and institutionalization of these people.⁽⁸⁾

In a meta-analysis by Martino et al.⁽⁹⁾ the prevalence of dysphagia in people with stroke on acute phase is between 37% and 45% in screening evaluations, 51% and 55% in clinical evaluation and 64 and 78% detected with the help of assessment tools.

The concept of dysphagia, or swallowing difficulty, includes behavioral, sensory and motor changes that occur during swallowing, involving the state of consciousness before eating, visual recognition of food and responses to physiological odor and the presence of food.⁽¹⁰⁾ Despite all the complications described, the literature shows that dysphagia is underdiagnosed by health professionals.⁽¹¹⁾ Impaired swallowing is a nursing diagnosis and is defined as an alteration in the ability to swallow.⁽¹²⁾

The early assessment of swallowing, within the first 4 hours after admission, is essential to start nutritional support for all people with acute stroke.⁽¹³⁾

There are several validated clinical and instrumental methods for diagnosing oropharyngeal dysphagia, and treatment is primarily based on compensatory measures. In this sense, more importance and attention should be given to oropharyngeal dysphagia and screening, treatment and regular monitoring

protocols should be included and implemented to avoid its main complications.⁽¹⁴⁾

There are currently numerous scales at international level that allow the identification and assessment of dysphagia. However, in Portugal, there are not many instruments available and properly validated. Nonetheless, in 2012 two instruments were validated to assess the existence of dysphagia in the Portuguese population, the Eating Assessment Tool 10 (EAT 10) and the Functional Oral Intake Scale (FOIS).⁽¹⁵⁾

The EAT-10 scale was created by Belafsky et al.,⁽¹⁶⁾ it is considered a quick, simple and useful assessment tool to detect the existence of dysphagia and monitor the person's response to treatment. It allows easy access only to the self-perception of dysphagia and, based on this information, confirms the degree of commitment of the function and the limitations of functionality caused in people's social and emotional lives. The scale is composed of 10 items, and its completion is carried out by the person, without the need for prior functional assessment. Thus, it classifies the statements with a score ranging from 0 (no problem) to 4 (big problem), with a score equal or greater than 3 to be considered abnormal.

Considering that dysphagia is a problem with such a significant impact on people's lives, the specialist nurse in rehabilitation nursing plays an important role in the proper assessment of dysphagia. In this perspective, knowledge of the psychometric properties is essential in order to verify whether the test has validity and reliability, not to compromise the results obtained. Thus, it is intended to evaluate the metric properties of the EAT-10 in a person with stroke with swallowing disorders.

METHOD

A Systematic Literature Review (SLR) was used, as this allows the identification, selection and critical evaluation of a set of studies in order to extract the best scientific evidence.⁽¹⁷⁾ The main steps of an SLR were followed: research question, problem definition, systematic review objectives; inclusion and exclusion criteria; search strategy; procedure selection; data extraction procedure; and procedure for evaluating the methodological quality of the selected studies.⁽¹⁸⁾

Based on the PICO strategy recommendations of the Joanna Briggs Institute (JBI),⁽¹⁹⁻²⁰⁾ the research question was formulated, where each dimension of the PICO contributed to define the inclusion criteria: Population (P) - People with stroke; Area of Interest (I) - EAT-10 metric properties and Context (Co) - swallowing/dysphagia alterations. Thus, the following research question was defined for this SLR: “What are the EAT-10 metric properties in a person with stroke with swallowing disorders?”.

The descriptors related to each of the components of the PICO strategy were: Stroke; Dysphagia Psychometrics; Validity of test; Reproducibility of results, previously validated in the Descriptors in Health Sciences and Medical Subject Headings platform. The following Keywords were also used: EAT 10 Assessment and Responsiveness.

The following were defined as eligibility criteria for the inclusion of articles: people with stroke, with swallowing/dysphagia disorders, at least one metric property, published in the last 5 years (2008-2014), in Portuguese, English and Spanish, with accessible full text. In evaluating the psychometric/clinical metric and metric properties, reproducibility, reliability, validity and responsiveness were taken into account.⁽²¹⁻²³⁾

For the research, the strategy used was determined by searching different electronic databases, periodicals and gray literature, in order to find primary/original studies or secondary studies. The search was carried out through electronic database platforms: EBSCO, Host, Google Escolar, Cochrane Lybrary Collection, Scielo and Proquest.

The research was carried out by four people simultaneously, from October 15th to November 15th 2014, the same databases were used for the research, in order to respect inter-observer reliability.

From the bibliographic research process carried out with this methodology, we obtained 3,772 articles for the initial selection. Out of these 3,700 were rejected by title or subject and 62 by abstract. Out of the 10 resulting, 4 were excluded after analysis of the full text, as they did not meet the defined inclusion criteria, with the final result of 6 articles included that met the inclusion criteria.

Table 1 describes the process of combining descriptors and keywords for searching the databases. Figure 1 illustrates the PRISMA⁽²⁴⁾ flowchart corresponding to the identification, analysis, selection and inclusion of articles.

Boolean Conjugation	EBSCO	GOOGLE SCHOLAR
“EAT-10”	235	580
“EAT-10” and Deglutition Disorders	33	595
“EAT-10” and Dysphagia	55	163
“EAT-10” and Validity	73	271
“EAT-10” and Reproducibility of	65	796

results		
“EAT-10” and Responsiveness	119	498
“EAT-10” and Assessment	8	81
Psychometrics and “EAT-10”	7	122
“EAT-10” and Stroke	53	267
“EAT-10” and Stroke and Psychometrics	3	34
“EAT-10” and Stroke and Psychometrics and Swallowing disorders	3	31
Total of articles	601	3171

Table 1 - Boolean Conjugation

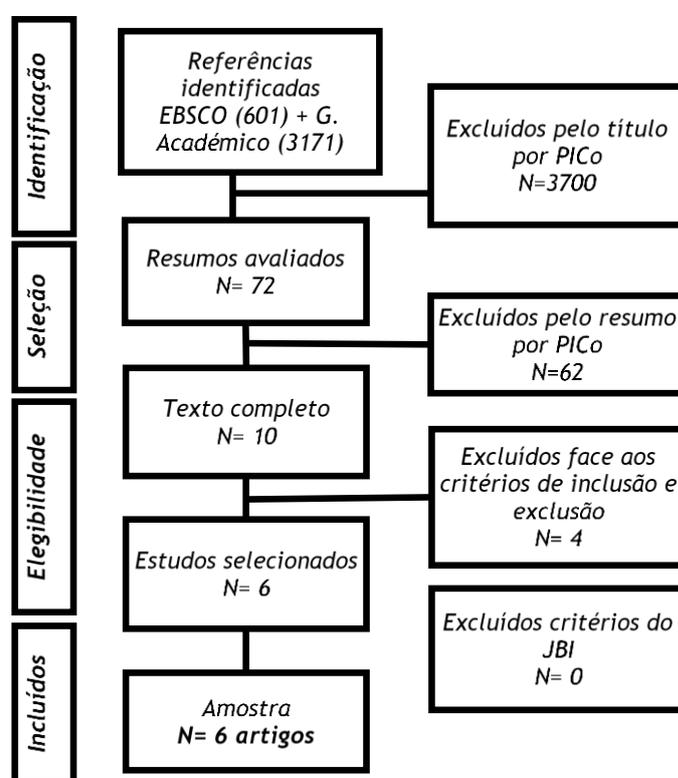


Figure 1 – Identification, analysis and selection of articles.⁽²⁴⁾

The articles selected for full reading were independently evaluated by two investigators, according to methodological quality criteria proposed by the JBI,⁽¹⁹⁾ and articles with more than 75% of the criteria were selected.

Information was extracted from the articles on authors, year, country, sample, data on metric properties, conclusion and level of evidence. The classification of the levels of evidence of the included studies was based on the criteria of the Registered Nurses Association of Ontario.⁽²⁵⁾

RESULTS

Six articles were included in this SLR, published in the following years: one in 2008,⁽¹⁶⁾ one in 2012,⁽²⁶⁾ three in 2013^(15,27,29) and one in 2014,⁽²⁸⁾ in which the countries

of origin were Brazil,⁽²⁹⁾ Spain^(26,28), United States of America,⁽¹⁶⁾ Italy⁽²⁷⁾ and Portugal.⁽¹⁵⁾ The sample of people with dysphagia ranged between 23⁽¹⁵⁾ and 482.⁽¹⁶⁾ Regarding the control group, it ranged between 10⁽²⁸⁾ and 269.⁽²⁷⁾ All studies included (Table 2) are studies descriptive, with level of evidence III,

meaning, evidence obtained from a well-designed, non-experimental study, such as comparative studies, correlation studies or case reports.⁽²⁵⁾

Authors, Year, Country and Population	Results	Conclusions	Evidence Level
Queirós A, Moreira S, Silva A, Costa R, Lains J. 2013, Portugal n= 23 and 23 controls ⁽¹⁵⁾	EAT-10 presents acceptable internal consistency (0.75) and observer agreement (0.86), as well as discriminant validity. The results also indicated that the Portuguese version of the FOIS shows acceptable agreement between observers (0.78) and criterion validity.	Valid, reliable and reproducible	III
Belafsky PC, Mouadeb DA, Rees CJ, Pryor JC, Postma GN, Allen J, Leonard R.J.. 2008, The United States, n=482 ⁽¹⁶⁾	The internal consistency (Cronbach's alpha) was 0.960. The intra-item and test-retest correlation coefficients ranged between 0.72 and 0.91. The mean EAT-10 score was 23.58 ± 13.18 for people with esophageal dysphagia, 23.10 ± 12.22 for people with oropharyngeal dysphagia, 9.19 ± 12.60 for people with voice disorders, 22.42 ± 14.06 for people with head and neck cancer and 11.71 ± 9.61 for people with reflux. The mean EAT-10 score of people with dysphagia improved from 19.87 ± 10.5 to 5.2 ± 7.4 after treatment (p < 0.001).	Valid, reliable, reproducible and responsive.	III
Burgos R, Sarto B, Seguro H, Romagosa A, Puiggrós C, Vázquez C, Cárdenas G, Barcons N, Araujo K, Pérez-Portabella C.. 2012; Spain, n=65 ⁽²⁶⁾	Internal reliability: good, Cronbach's Alpha 0.87 Validity: High correlation between scale items and total score (p<0.001). People with dysphagia = 15 ± 8.9 of People at risk of dysphagia = 6.7 ± 7.7 and People without risk of dysphagia = 2 ± 3.1. There was a Moderate correlation between total score and age (Spearman's Coefficient=0.37)	Reliable and valid	III
Schindler A, Mozzanica F, Monzani A, Ceriani E, Atac M, Jukic-Peladic N, Venturini C, Orlandoni P, 2013, Italy n=304 e 269 control ⁽²⁷⁾	- Reproducibility: Internal Consistency (Cronbach's Alpha) in a group of people with dysphagia = 0.90 and for a group of healthy people = 0.93 - Pearson's Correlation Coefficient (0.95 in people with dysphagia and 0.98 in asymptomatic individuals) - Intraclass Correlation (ICC): 0.95 and 0.98, respectively - Cut-off 2.8. Normal if ≤ 2.8 - Correlation between the scores of people with dysphagia and healthy individuals was low. - People with dysphagia had higher values of the score in each item and in total - The EAT-10 total score correlated positively with the assessment through endoscopy - When using the EAT-10 before and after the rehabilitation plan, there was a weak and positive correlation p=0.4.	Valid, reliable and responsive.	III
Rofes L, Arreola V, Mukherjee R, Clave P.; 2014, Spain, n= 160 e 10 controls ⁽²⁸⁾	- Applied EAT-10 in 133 people with diaphagia (101 with a score ≥3 (75.9%)) - Applied the V-VST in 134 people with dysphagia (in 105 had swallowing disorders (78.4%)) - Accuracy was 0.89 in EAT 10 (ROC curve) - Cut-off: 2 - EAT 10 showed high levels of sensitivity, in detection (0.895), in insecurity in swallowing (0.915) and silent aspiration (0.933)	Valid	III
Gonçalves MI, Remaili C, Behlau M.; Brazil, 2013 N=107 ⁽²⁹⁾	- Discriminative power of 72. 97% - Sensitivity of 69.70% and Specificity of 72. 00% - Cut-off > 3	Valid	III

Table 2: Main results and conclusions of the six article

DISCUSSION

Reproducibility

The internal consistency assessed by Cronbach's alpha ranged between 0.75⁽¹⁵⁾ and 0.96⁽¹⁶⁾. In the validation

study of the Italian version it was 0.90⁽²⁷⁾ and in the study of the Spanish version it was 0.87.⁽²⁶⁾

In studies where internal consistency was assessed^(15-16, 26-27) the scale proved to be reliable as it was higher

than 0.7, with values classified as reasonable and excellent⁽²¹⁻²³⁾.

In the inter-observer agreement, the value of the test was 0.86 in the Portuguese version⁽¹⁵⁾, which demonstrates good inter-observer reproducibility.⁽²¹⁻²³⁾ The test-retest ranged from 0.72 to 0.91 for the American version⁽¹⁶⁾ and in the Italian version ranged between 0.95 and 0.98.⁽²⁷⁾ which demonstrated its stability or intra-observer reproducibility.⁽²¹⁻²³⁾

Validity

In the validity study, was intended to verify whether the instrument evaluate what it was supposed to evaluate.⁽²¹⁻²³⁾ Construct validity was verified through the correlation of the items with the total score of the scale, in the study by Belafsky et al.⁽¹⁶⁾ Criterion validity was the most studied, through discriminant validity,^(15-16, 26-27) in which it was found that the EAT-10 can discriminate people with dysphagia from healthy individuals, proving to be valid for the purpose of the scale: detect the existence of dysphagia.

The study carried out by Rofes et al.⁽²⁸⁾ highlighted the importance of increasing the sensitivity of the test by around 5%, through the analysis of the ROC curve, defining the cut-off value for ≤ 2 , which was found not to affect specificity, resulting in fewer false negatives.

Responsiveness

Through the study by Belafsky et al.⁽¹⁶⁾ and Schindler et al.⁽²⁷⁾ it was concluded that the EAT-10 is responsive, as it was shown that this is sensitive to change, namely in the changes in the before and after treatment and plan of rehabilitation in the group of people with dysphagia $p < 0.001$ and $p = 0.01$, respectively. However, it was the least studied metric property, the ceiling effect, floor effect, magnitude effect were not verified.⁽²¹⁻²³⁾

The EAT-10 scale proved to be an easy-to-understand and quick-completion instrument, considered useful in clinical practice for detecting dysphagia. In the study by Burgos et al.,⁽²⁶⁾ as well as in the study by Schindler et al.⁽²⁷⁾, the limitation of this scale was unanimously highlighted, as it is not suitable for its applicability in individuals with cognitive alterations, as it requires person's participation. However, in the article by Gonçalves et al.,⁽¹⁵⁾ it was also found that in 13 of the participants, the questionnaire was read to them due to difficulties in reading or understanding the instructions or because of the absence of glasses at the time of the exam.

It is also relevant to consider the conclusion of the SLR, performed by Speyer Speyer et al.⁽³⁰⁾ whose established objective was to assess the psychometric properties of the instruments for the functional assessment of oropharyngeal dysphagia, including the EAT-10. In this study, was concluded that the instruments that included the EAT-10 verified that the validity and reproducibility were classified as insufficient. In this sense, the authors recommended

the development of new scales that meet the criteria of reasonableness of the psychometric properties.

Practical implications

Most of the studies included in the SLR carried out the validation study in people with swallowing/dysphagia disorders that appeared in the context of stroke.

Since dysphagia is a common and highly prevalent consequence in people with stroke, it is considered important for clinical practice to carry out further studies that assess all metric properties, with a special focus on responsiveness.

Being dysphagia, a increasingly problem with a great impact on personal life, it is up to the Specialist Nurse in Rehabilitation Nursing to adequately assess and manage dysphagia. Through an individual rehabilitation program, it is intended to adopt appropriate strategies so that the person with dysphagia or swallowing disorders is as autonomous as possible, integrating them into their family and community.

Through the numerous duly validated assessment instruments, namely the EAT-10 scale, the Specialist Nurse in Rehabilitation Nursing is able to identify early swallowing changes, diagnose, intervene and measure the results of their interventions as quickly as possible. It is intended, therefore, to reduce the occurrence of complications and to contribute to an improvement in the care of the person, promoting an improvement in the quality of life.

Study limitation

The limitation refers to the inclusion only of articles in Portuguese, English and Spanish, as well as the inclusion of free access articles.

CONCLUSION

Based on the reading and analysis of the six articles included in this SLR, it was possible to know and to assess the psychometric properties of the EAT-10 scale in people with stroke with swallowing disorders or dysphagia. It was found that the EAT-10 was considered an assessment instrument that proved to be valid in the original English language version as well as in the versions in which cross-cultural equivalence was verified, namely, Portugal, Brazil, Spain and Italy.

The absolute limitation found in the applicability of the EAT-10 scale focused on the incompatibility of its use in individuals with cognitive alterations, as it is a self-assessment scale. Other relative limitations found were related to changes in visual acuity, difficulty in reading or writing.

It was verified with the accomplishment of this work, that there are still few articles that include in their study the responsiveness evaluation, in a pre-established period of time.

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IMPACTE DE UM PROGRAMA DE EXERCÍCIO FÍSICO (ERIC) EM CONTEXTO DE INTERNAMENTO NO DOENTE COM INSUFICIÊNCIA CARDÍACA DESCOMPENSADA - ESTUDO PRELIMINAR

EJERCICIO FÍSICO EN EL PACIENTE ADMITIDO POR INSUFICIENCIA CARDIACA DESCOMPENSADA - PROGRAMA ERIC
NURSING EXERCISE IN PATIENTS ADMITTED BY RECENTLY DECOMPENSATED HEART FAILURE - THE ERIC PROGRAM

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Bruno Delgado¹; Ivo Lopes¹; Eugénia Mendes²; Leonel Preto²; André Novo³; Bárbara Gomes⁴

1 - Centro Hospitalar do Porto - Hospital de Sto. António; 2 - Escola Superior de Saúde do Instituto Politécnico de Bragança;
3 - NURSEID - CINTESIS - Escola Superior de Saúde do Instituto Politécnico de Bragança;
4 - NURSEID - CINTESIS - Escola Superior de Enfermagem do Porto

RESUMO

Introdução: A insuficiência cardíaca (IC) acarreta limitação nas atividades da vida diária e consequente perda de autonomia funcional e instrumental. Representa um dos problemas de saúde mais preocupantes devido ao seu impacto económico significativo.

Objetivo: Identificar o impacto de um programa de exercício físico nos doentes com IC em fase de compensação em contexto hospitalar.

Métodos: Foi implementado um estudo exploratório retrospectivo no qual participaram vinte doentes que realizaram um mínimo de 3 sessões do programa ERIC. Os sinais vitais, monitorização do ECG e da perceção subjetiva de esforço (PSE) foram avaliados antes e depois de cada sessão de treino, bem como escala London Chest Activity of Daily Living (LCADL) e os parâmetros do exercício (número de voltas na pedaleira, o número de metros caminhados no corredor e número de degraus percorridos). O estudo apresentado decorreu num período de 3 meses.

Resultados: Os doentes (idade média de 64 anos) apresentaram uma variação positiva nos parâmetros de desempenho do exercício, uma variação negativa na escala LCADL (29,9-20,9) e PSE após o exercício (4,85-3,82), o que significa que melhoraram a sua capacidade funcional ao longo do programa. Nenhum dos doentes apresentou eventos adversos ou treinou fora do intervalo de frequência cardíaca de segurança (valor médio de 11,2 bpm a 12,9 bpm).

Conclusões: O programa ERIC demonstra segurança e melhoria da Capacidade Funcional do doente, com base na análise estatística desta amostra, Estes resultados permitem-nos inferir que o exercício poderá ser um recurso efetivo para o tratamento coadjuvante de doentes admitidos com insuficiência cardíaca descompensada. Contudo, serão necessários mais estudos com amostras maiores e com desenho do tipo randomizado.

Palavras-chave: Exercício, insuficiência cardíaca, segurança, eficácia, Enfermagem de Reabilitação

RESUMEN

Antecedentes: la insuficiencia cardíaca (IC) acarrea limitaciones en las actividades de la vida diaria y la consiguiente pérdida de la autonomía funcional e instrumental. Representa uno de los problemas de salud más preocupantes debido a su impacto económico significativo.

Objetivo: Identificar el impacto de un programa de ejercicio físico en pacientes con IC en fase de compensación en contexto hospitalario

Métodos: Se implementó un estudio exploratorio retrospectivo en el que participaron veinte enfermos que realizaron un mínimo de 3 sesiones del programa ERIC. Los signos vitales, la monitorización del ECG y la percepción subjetiva de esfuerzo (PSE) se evaluaron antes y después de cada sesión de entrenamiento, así como la escala LCADL y los parámetros del ejercicio (número de vueltas en la pedalier, el número de metros caminados en el pasillo y número de escalones recorridos). El estudio presentado tuvo lugar en un período de 3 meses.

Resultados: los pacientes (edad media de 64 años) tuvieron una variación positiva en los parámetros de rendimiento del ejercicio, una variación negativa en la escala de LCADL (29.9 a 20.9) y PSE después del ejercicio (4.85 a 3.82), lo que significa que mejoraron su capacidad funcional durante todo el programa. Ninguno de ellos presentó eventos adversos ni fue entrenado fuera del intervalo de frecuencia cardíaca de seguridad (valor promedio de 11. 2 lpm a 12.9 lpm).

Conclusiones: El programa ERIC demuestra seguridad y mejora de la capacidad funcional del paciente sobre la base del análisis estadístico de esta muestra. Estos resultados nos permiten inferir que el ejercicio puede ser un recurso efectivo para el tratamiento secundario de pacientes admitidos con insuficiencia cardiaca descompensada. Sin embargo, se necesitarán más estudios con muestras más grandes y con diseño de tipo aleatorizado.

Palabras clave: Ejercicio, insuficiencia cardíaca, seguridad, eficacia, Enfermería en Rehabilitación

ABSTRACT

Background: Heart failure (HF) results in limitations on the activities of daily living and consequent loss of functional and instrumental autonomy. It represents one of the most concerning health problems due to its significant economic impact.

Objective: To identify the impact of a physical exercise program on patients with HF in compensatory phase in hospital context.

Methods: A retrospective exploratory study was carried out in which twenty patients who performed a minimum of 3 sessions of the ERIC program participated. Vital signs, ECG monitoring and subjective effort perception (SEP) were assessed before and after each training session, as well as London Chest Activity of Daily Living (LCADL) scale and exercise parameters (number of laps in the pedal, number of meters walked in the hall and number of steps). The study presented took place over a period of 3 months.

Results: Patients (mean age of 64 years-old) had a positive variation in the performance parameters of the exercise, a negative variation in LCADL scale (29.9 to 20.9) and SEP after exercise (4.85 to 3.82), which means that they improve their functional capacity throughout the program. None of them presented adverse events or trained outside the safety heart rate interval (mean value of 11.2 bpm to 12.9bpm).

Conclusions: The ERIC program demonstrates safety and improvement of the Functional Capacity of the patient, based on the statistical analysis of this sample. These results allow us to infer that exercise can be an effective resource for the adjuvant treatment of patients admitted with decompensated heart failure. However, further studies with larger samples and a randomized design are needed.

Key words: Exercise, heart failure, safety, efficacy, Rehabilitation Nursing

INTRODUCTION

Heart failure (HF) is a syndrome characterized by signs and symptoms such as dyspnea, fatigue and edema, which lead to decreased exercise tolerance, functional dependence and impaired performance in activities of daily living (ADL), as well as limitations in social life and, consequently, decreased quality of life⁽¹⁻³⁾. It has a significant economic impact due to the high cost of treatment, patient disability, lack of productivity and high mortality rates^(4, 5). It represents, in Portugal, more than 50.000 hours of hospitalization, corresponding to 12% of hospital deaths⁽⁶⁾.

HF is usually classified according to its functional status using the New York Heart Association (NYHA) scale⁽⁷⁾.

The treatment of HF is prolonged and multifactorial. One of the most important tools is cardiac rehabilitation (CR). CR can be defined as a sum of activities that favorably influence the underlying causes of cardiovascular disease, so that patients can obtain the best physical, psychological and social conditions, resuming their role in society as normal as possible^(8, 9, 10).

Physical exercise is a safe, economical and viable therapeutic resource. In accordance with the recommendations of the European Society of Cardiology⁽³⁾, it is recommended, with the highest level of evidence, that patients with HF be included in aerobic exercise programs to increase their functional capacity (FC) and improve symptoms^(3, 8). The performance of regular physical activity is directly related to a decrease in cardiovascular mortality, improvement in quality of life, decrease in the hospitalization rate and even decrease in exercise intolerance, and should be encouraged in daily clinical practice^(3, 8). Aerobic training is the best studied non-pharmacological method for the treatment of patients with chronic HF⁽⁷⁾.

However, physical exercise has not been fully studied or validated for patients with HF in the compensation phase. There are several recommendations for performing exercise tolerance tests and safety parameters, which are fundamental, but there is still no evidence of their benefit or adverse effect in patients in the compensating phase^(7, 11).

The beneficial effects of physical exercise are related to the improvement of cardiovascular and respiratory function, such as increased maximum oxygen consumption, decreased myocardial oxygen consumption, decreased blood pressure (BP) and resting heart rate (HR), increased ischemic threshold, improvement in cardiovascular risk factors, decreased mortality associated with coronary heart disease and increased quality of life, among others^(11, 12).

The exercise prescription is based on the verification of parameters such as Frequency, Intensity, Time and Type of exercise (FITT), which must be adjusted according to various determinants, such as the place where the exercise is performed (inpatient or outpatient), the stage of the disease (acute or chronic) and limitations or patient motivation⁽¹¹⁾.

This work intends to present the ERIC program (a supervised physical exercise program, aimed at patients admitted with decompensated heart failure) and to identify its impact, over a period of three months, in order to answer the research questions: "Can the physical exercise, through the ERIC program, promote improved functional capacity in patients with HF undergoing compensation in a hospital context?" and "Is the ERIC program clinically safe?"

METHODOLOGY

A retrospective exploratory study was carried out based on existing data in the computer system to support Nursing practice, resulting from the

implementation of the ERIC program, collected and recorded by the principal investigator. This program has been implemented since the third quarter of 2014, having undergone some changes in its structure, resulting from the analysis carried out periodically. The third quarter of the year 2016 was randomly selected for the analysis presented here. The study was authorized by the Centro Hospitalar do Porto ethics committee (Ref. 2016.172). A new analysis of data from the last 18 months is currently underway.

All patients hospitalized for decompensated heart failure who met the inclusion criteria were included, in order to obtain a larger and more heterogeneous sample. The main objective of the ERIC program is to promote functional capacity in these patients, regardless of the etiology of heart failure or the patient's functional status.

The ERIC program is a Portuguese program created by the researcher and his colleagues, whose acronym stands for Rehabilitation Nursing for Patients with Heart Failure. The study in question is based on version 1.0 of the program and was authorized by the local ethics committee.

The inclusion and exclusion criteria are shown in table 1. It should be noted that the exclusion criteria are temporary, that is, as soon as the aforementioned criteria is no longer met; the patient will be able to perform the exercises.

Inclusion criteria	Exclusion criteria
Ability to provide informed consent	Refusal to participate in the program
Age over 18 years-old	Inotropic medication perfusion or oxygen at a rate greater than 3l/min
Admission clinical diagnosis of HF	Hemodynamic, electrical and hydroelectrolytic instability during exercise performance
Dependence on ADLs due to HF	Osteoarticular pathology that compromises the performance of the exercises

Table 1 – Criteria of inclusion and exclusion

The ERIC program comprises progressive levels of intensity, divided into 4 stages (Table 2), which aims to develop the patient's functional capacity, improve their exercise tolerance, create physical exercise habits, promote their instrumental and functional autonomy and be a non-pharmacological treatment during the stabilization phase of the disease.

Stage	Designation
I	5 Min of exercise cycling
II	10 Min of walking
III	Stage II + 5 min of stair mill
IV	Stage III + muscle strengthening

Table 2 – stages of ERIC Program

Upon admission of the patient, the inclusion and exclusion criteria are analyzed and if there are no contraindications to exercise, the patient starts the program at stage I. Parameters such as: relevant clinical history, especially cardiovascular; perception of the importance of physical exercise as a healthy habit and the level of commitment that dyspnea promotes in the performance of ADLs using the London Chest of Activities of Daily Living (LCADL). The patient's level of physical activity is also assessed, as well as whether they have stairs at home. The perception of the importance of physical exercise is evaluated by a direct closed question "Do you consider that performing physical exercise is something important that can improve your cardiovascular health?". Regarding the level of physical activity, the criteria currently in effect defined by the World Health Organization are used (150 minutes of moderate-intensity aerobic training or 60 minutes of vigorous-intensity aerobic training).

In all training sessions, vital parameters are evaluated before and after exercise and as needed, as well as the SEP through the modified Borg scale, at the end of the session. The patient should have about 4 to 5 sessions a week, one session a day, and is encouraged to do physical activity during the other days. ADLs are always encouraged with or without supervision, depending on the patient's limitations.

In case of discomfort or worsening of the clinical condition, the investigator interrupts the exercise, considering the number of laps/meters/steps, for the elapsed time. The progression or regression throughout the program varies according to the Borg scale value at the end of the exercise (2 evaluations between 1 and 3, the patient advances in stage, between 4 and 6 maintains stage, between 7 and 10 returns to previous stage or suspend (if at the first stage).

The most important results of the program will be divided into two groups: the first is related to the safety and intensity of the program and the second is related to performance during the program.

The safety of physical exercise is related to its adequate intensity^(8, 13). The American College of Sports and Medicine (ACSM) determines that some parameters are verified when patients are approached during the acute and post-acute phase, namely the variation in HR during exercise, which must be between 20 to 30 bpm above the resting heart rate; SEP below 16 (Borg scale), SBP (Systolic Blood Pressure) variation between 30 and 40mmHg above the resting value⁽¹⁴⁾, as well as absence of adverse events, such as arrhythmias, pain, severe dyspnea or falls during the exercise session. In this program, we decided to use the Modified Borg scale so that the ideal SEP is below 8.

To measure the performance of the program, some exercise execution parameters were analyzed, such as: the number of turns on the pedals, the number of meters walked in the corridor and the number of steps covered. In addition to these parameters, the LCADL scale score was also analyzed.

In order to systematize the information, a form was created with all the assessments carried out and also with data from the different exercise sessions, namely vital signs, scores on different scales and exercise performance parameters.

RESULTS

Data were organized and analyzed using IBM SPSS® version 21 and Microsoft Office Excel 2007; the results between the first and the last exercise session were compared.

The mean age of participants (n = 20) is 64 years-old, with a standard deviation of 9.97, of which 16 are male. The mean length of hospital stay was 18.6 days, with a standard deviation of 12.66 (min = 7 and max = 53). Patients performed an average of 4.4 exercise sessions (min=3 and max=8). The training program starts as soon as clinical safety conditions are met, which varies from patient to patient.

The NYHA functional class classification of these patients indicates a high level of functional limitation in most of them (20% are NYHA functional class IV and 65% NYHA class III). Only 20% of the sample reported regular physical exercise, compatible with the tendency towards a sedentary lifestyle in these patients (Table 3).

Parameters	%	n
Men	66	16
Functional class IV NYHA (resting dyspnea)	20	4
NYHA functional class III (less than normal physical activity causes symptoms of tiredness)	65	13
NYHA functional class II (tired symptoms for normal physical activity)	15	3
Previous exercise practice	20	4

Table 3 – Sample characterization

Most patients have severe depression of ventricular function, corresponding to 65% of the sample. The others are distributed between preserved function (20%) and mild to moderate depression (15%).

The analysis of the exercise intensity parameters indicates that exercise was performed within the parameters predicted as safe by the ACSM, as shown in table 4. There was no need to discontinue any of the sessions performed by this sample of patients. None of the patients had pain, falls, worsening of the clinical condition or arrhythmia during the sessions.

Parameters	First session	Last session
HR variation (average)	11.2bpm	12.92bpm
SBP variation (average)	9.75mmHg	8.75mmHg
SEP (average)	6.45	4.1

Table 4 – Exercise Intensity Parameters

Only 2 patients needed to go back in the program stage, due to the Borg value presented at the end of

the exercise session, and they had the opportunity to progress later.

The variation of some parameters such as the number of exercise sessions, the duration of each one and the LCADL scale score are presented in table 5.

Parameters	First session	Last session
Average exercise time	6.7min	11.4min
Score of LCADL (average)	29.9	20.9

Table 5 - Patient performance throughout the program

There is an improvement in the performance of patients throughout the program (exercise performance parameters), especially in the number of meters covered. Only 6 of the 20 patients performed stair training and showed a positive variation in the number of steps covered in the different sessions - table 6.

Parameters (average)	First session	Last session
Nº of turns on bike (stage I)	249.3	363
Nº of covered meters	178.75	381.67
Nº of stairs	-	65

Table 6 - Exercise execution parameters

Some correlations were made using Spearman's test, between the different variables that change during the physical exercise session, that is, HR at rest, at effort (highest value reached during the exercise session) and its variation (difference between the effort value and the resting value); oximetry, number of meters covered and steps on the stairs, number of turns on the pedals and total exercise time. These variables are evaluated in all training sessions, sessions that take place as long as the patient has the clinical conditions to start it until the date of discharge. Vital parameters were collected through cardiac monitoring telemetry and by the non-invasive blood pressure monitor and respective oximeter. There are statistically significant correlations, namely between oximetry and exercise duration; variation in HR and in the number of meters covered; exercise duration and HR at rest and during exertion. These results are shown in table 7.

Co-relations	Exercise duration	HR at rest	HR at effort	Nº of meters covered
Oximetry	0.667 * p = 0.001	-0.774 * p < 0,001	-0.593 * p = 0.006	-
HR variation	-	-	0.480 ** p = 0.032	-0.670 ** p = 0.017
Exercise duration	-	-0.639 * p = 0.002	-0.597 * p = 0.005	-

Level of significance of 0,01* Level of significance of 0,05**

Table 7 – Spearman correlations between physiological variables

DISCUSSION

The sample is mostly male (80%) and the average age is 64 years-old, which is in agreement with the Cochrane Collaboration (2001) ⁽¹⁸⁾ review about the benefits of structured and monitored physical exercise in coronary heart disease, as well as with data from the European Society of Cardiology ⁽⁷⁾.

The mean age is also consistent with the Cochrane review, in which, in most studies, there is a prevalence of the age group between 50 and 70 years-old ⁽¹⁸⁾.

The practice of physical exercise can be performed by patients during the compensation phase, and without effort tolerance tests, as long as the safety criteria are verified, namely: HR variation during exercise, systolic BP and SEP ⁽¹¹⁾. The mean values of these parameters in the present sample are within the recommended ranges.

According to the ACSM, during the hospitalization phase, when the disease is not fully stabilized, the exercise duration should be between 3 and 5 minutes according to the patient's tolerance, with rest periods and progressing for longer periods from 10 to 15 minutes, it is desirable to increase the exercise intensity ⁽¹¹⁾. Also for these parameters, we verify that the values are as recommended.

According to previous results, the exercise program was safely implemented, as all patients performed the exercise within the recommended safety parameters. Only 2 patients needed to go back to the previous stage after an exercise session, as they reported fatigue with a Borg level above 7. However, they were able to progress again after the following sessions.

Based on the correlations, we can conclude that, in this sample of patients, higher oximetry values are positively correlated with exercise duration. Patients with better oxygenation will be able to perform longer periods of exercise, as good oxygenation will allow for better cellular and metabolic performance. Oximetry is negatively correlated with HR in exertion and at rest, that is, when the patient has a higher cardiac work, due to the aerobic training performed, he has a lower peripheral oxygen value - greater cardiac work will lead to greater consumption of oxygen, resulting from the use of large muscle groups involved in the execution of physical exercise training.

Regarding the HR variation, this seems to correlate positively with HR in effort and negatively with the distance covered in meters. Thus, when the patient significantly increases the number of beats at peak effort compared to the baseline, he will be able to travel shorter distances (they will get tired quicker, the cardiac work will be greater and, therefore, the patient will decrease the speed of walking, covering fewer meters in the same estimated period of time). This fact reminds us of the importance of keeping the positive variation in HR within the range of 20-30bpm as a preventive measure against adverse events ⁽¹¹⁾.

Regarding exercise duration, there is a negative correlation with HR in effort and at rest. These values can have two meanings, namely, that patients with

lower basal and non-pathological HR can achieve better performance during exercise (more meters); or the more exercise patients perform, the more their perception of exertion and HR at rest decrease ⁽¹⁹⁾. This statistical result leads us to the beneficial effect of exercise, associated with the reduction of basal HR, directly related to the increase in resistance to oxidative stress ⁽¹⁹⁾. Higher resting HR, as well as reduced ejection fraction, are predictive factors of cardiovascular mortality and should be controlled.

Although these results are in accordance with scientific knowledge about the effects of physical exercise on the cardiovascular system, most studies were carried out in patients in an outpatient setting and not in the clinical compensation phase. Furthermore, this sample may not be representative due to the small number of patients. However, this can be a predictive factor that, even in the disease compensation phase, physical exercise can produce gains similar to those obtained in the post-acute phase, enhancing those that can be obtained with the continuation of the program after hospital discharge.

The vast majority of studies on FC in cardiac patients demonstrate an improvement in this item associated with the practice of physical exercise; however, they refer to patients in an outpatient setting. Thus, it is important to know if this trend also occurs in compensation phase of HF.

The tests most used to predict FC are related to the distance covered by the patient in a given period of time, namely the 6-minute walk test or the 10-minute walk test, for example ⁽²⁰⁾. To predict an improvement in FC, there must be a significant increase in the distance covered between two different assessments: the first before the intervention and the second after some type of intervention ^(20, 21).

In this study, patients walk at their own pace and ideally without stopping, with a progressive increase in the distance walked between two assessments, with mean values ranging between 178 and 381 meters. We can infer that, even in the phase of disease compensation, patients present an improvement in their FC when performing the physical exercise program. However, a more representative sample and control group will be needed to ensure that the program is responsible for this FC improvement.

In addition to the distance covered in meters, the LCADL scale score, the Borg score at the end of the exercise and the average exercise time can be indicative of the improvement in the patient's physical condition and, consequently, in his FC. As previously noted, patients decrease the LCADL value, which indicates better performance in ADL's; decrease the Borg score after exercise, indicative of greater physical fitness and greater resistance to exercise, and increase exercise time during the program.

CONCLUSION

It is concluded that the ERIC program proved to be a safe intervention in patients with recently decompensated HF. Regarding efficacy, it was found

that the practice of physical exercise in this group of patients would likely bring physiological and functional benefits (improvement of FC), however, a study with a control group will be necessary to ensure that the functional improvement of patients is related to the program.

As limitations of the study, one can mention ⁽¹⁾ the lack of scientific articles on physical exercise in the HF compensation phase (the existing ones refer to patients with coronary heart disease and not HF), ⁽²⁾ study design - absence control group and ⁽³⁾ reduced number of patients in the sample in question.

Motivated by these results and by the need for stronger evidence, a double open and randomized clinical trial is in progress to overcome the aforementioned limitations.

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CLASSIFICAÇÃO INTERNACIONAL DE FUNCIONALIDADE, INCAPACIDADE E SAÚDE PARA ACIDENTE VASCULAR CEREBRAL

INTERNATIONAL CLASSIFICATION OF FUNCTIONING, DISABILITY AND HEALTH FOR STROKE

CLASIFICACIÓN INTERNACIONAL DE FUNCIONALIDAD, INCAPACIDAD Y SALUD PARA ACCIDENTE VASCULAR CEREBRAL

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Liliana Cristina Amaro Relhas³; Ricardo Filipe Pereira Ramos⁴; Ana Cristina Lopes Figueiredo¹; Ana Isabel Gouveia Da Silva Braga²; Helena Castelão Figueira Carlos Pestana⁵; Luis Manuel Mota Sousa^{5,6}

1 - IPOFG Lisboa; 2 - USF Vista Tejo, Monte da Caparica; 3 - Hospital Egas Moniz, Centro Hospitalar Lisboa Ocidental; 4 - Hospital de São Francisco Xavier, Centro Hospitalar Lisboa Ocidental; 5 - Escola Superior de Saúde Atlântica; 6 - Hospital Curry Cabral, Centro Hospitalar Universitário Lisboa Central

RESUMO

Contexto: O Acidente Vascular Cerebral (AVC) é uma das doenças com maior prevalência a nível mundial, com impacto na funcionalidade das pessoas sobreviventes.

Objetivo: identificar o *Score Set* da Classificação Internacional de Funcionalidade, Incapacidade e Saúde (CIF) para pessoas após AVC.

Material e Métodos: A pergunta de investigação, foi elaborada segundo as recomendações do Joanna Briges Institute (JBI) a partir da estratégia PICO (Population, Interest phenomenon, Context). Cada dimensão do PICO contribuiu para a definição de critérios de inclusão, nomeadamente Population (P) Pessoa após AVC; Interest phenomenon (I) Score set CIF; Context (Co) Comunidade. A pesquisa eletrónica foi feita nas bases de dados Medline, SciELO, biblioteca virtual em saúde e EBSCO, de publicações entre 2013 a 2017.

Resultados: Dos artigos identificados, foram selecionados 11, tendo sido identificados 160 códigos da CIF, que caracterizam a funcionalidade das pessoas após AVC. Destes 160 códigos, verificou-se que 21, divididos por 3 categorias CIF, apresentam uma frequência maior ou igual a 50%.

Conclusões: O *score set* da CIF para pessoas após AVC está distribuído da seguinte forma: 6 códigos das Funções do Corpo (29%), 13 códigos das Atividades e Participação (61%) e 2 códigos dos Fatores Ambientais (10%).

Descritores: Classificação Internacional de Funcionalidade, Incapacidade e Saúde; Acidente Vascular Cerebral; Enfermagem de Reabilitação.

RESUMEN

Contexto: el Accidente Vascular Cerebral (AVC) es una enfermedad cardiovascular con mayor prevalencia a nivel mundial, con impacto en la funcionalidad de las personas sobrevivientes.

Objetivo: identificar el *Score Set* de la Clasificación Internacional de Funcionalidad, Incapacidad y Salud (CIF) para personas después del AVC.

Material y Métodos: la pregunta de investigación, fue elaborada según las recomendaciones del Joanna Briges Institute (JBI) a partir de la estrategia PICO (Population, Interés, Context). Cada dimensión del PICO contribuyó a la definición de criterios de inclusión, en particular Population (P) Persona después de AVC; (I) Score set CIF; Context (Co) Comunidad. La pesquisa electrónica se realizó en las bases de datos Medline, SciELO, Biblioteca Virtual em Saúde y EBSCO, de publicaciones entre 2013 a 2017. **Resultados:** De los artículos identificados, han sido seleccionados 11 artículos donde fueron identificados 160 códigos de la CIF, que caracterizan la funcionalidad de las personas después del AVC. De estos 160 códigos, se verificó que 21 están divididos por 3 categorías CIF, presentan una frecuencia mayor o igual al 50%. **Conclusiones:** El *score set* de la CIF para personas después de AVC está distribuido de la siguiente forma: 6 códigos de las Funciones del Cuerpo (29%), 13 códigos de las Actividades y Participación (61%) y 2 códigos de los Factores Ambientales (10%).

Descriptor: Clasificación Internacional del Funcionamiento, de la Discapacidad y de la Salud; Accidente Cerebrovascular; Enfermería en Rehabilitación.

ABSTRACT

Background: Stroke is a cardiovascular disease with the highest prevalence worldwide, with impact on the functionality of survivors.

Objective: To identify the *Score Set* of the International Classification of Functioning, Disability and Health (ICF) for people after stroke.

Material and Methods: The research question was performed according to the Joanna Briges Institute (JBI) recommendations and PICO framework (Population, Interest phenomenon, Context). Each dimension of the PICO contributed to the definition of inclusion criteria, namely Population (P) Person after stroke; Interest phenomenon (I) Score set ICF; Context (Co) Community. The electronic research was done in the Medline, SciELO, virtual health library and EBSCO databases, between 2013 and 2017.

Results: Out of the identified articles 11 were selected and 160 ICF codes were identified, which characterize the functionality of people after stroke. Of these 160 codes, it was verified that 21, divided by 3 ICF categories, presented a frequency greater than or equal to 50%.

Conclusions: The ICF score set for people after stroke is distributed as follows: 6 Body Functions (29%), 13 Activity and Participation (61%) and 2 Environmental Factors (10%).

Keywords: International Classification of Functioning, Disability and Health; Stroke; Rehabilitation Nursing.

INTRODUCTION

Cerebrovascular accident (CVA) can be defined as a cardiovascular disease caused by the interruption of the blood supply to the brain, with a decrease or absence of oxygen and nutrients supply, causing damage to the brain tissue.⁽¹⁾

Stroke has a high worldwide prevalence.⁽²⁾ This pathology is the second leading cause of death worldwide, accounting for approximately 5.7 million deaths, equivalent to 9.9% of all deaths.⁽¹⁾

The incidence of stroke, adjusted to the World Health Organization (WHO) standard world population, ranged from 76 per 100,000 population per year in Australia (2009-10) to 119 per 100,000 population per year in New Zealand (2011-12).⁽³⁾ The incidence of stroke has increased worldwide, in both men and women of all ages.⁽⁴⁾

At the beginning of the 21st century, the age-standardized incidence of stroke in Europe ranged from 95 to 290/100,000 per year, with monthly mortality rates ranging from 13 to 35%.⁽⁵⁾

In Portugal, between 1990 and 2012, there was an increase in the incidence rate of stroke from 265.1/10⁵ to 343.7/10⁵.⁽⁶⁾

In 2015, there were 11,778 deaths in Portugal due to cerebrovascular diseases. By gender, there were 5057 deaths of men and 6,721 of women.⁽⁷⁾

In addition to the high mortality rate, this clinical condition is assumed to be one of the main causes of morbidity, with high social and economic burdens, since only 10% of stroke survivors recover almost entirely, 25% recover with minimal sequelae, 40% are left with moderate to severe disability, requiring specialized care, 10% need long-term care requiring institutionalization, and 15% die after stroke.⁽⁸⁾ In this perspective, the person after a stroke, it has some altered functions, with implications for activity and participation and consequently for its functionality, namely with regard to basic, instrumental and social activities of daily living. The ICF presents a conceptual framework that allows analyzing the person's functionality under these conditions.

The ICF resulted from the revision of the previous International Classification of Impairments, Disabilities and Handicaps (ICIDH), experimental version published in 1980 by WHO. In 2001, WHO proposed an update to

the old model, creating the ICF.⁽⁹⁾ This new model has the general objective of providing a unified and standardized language as well as a framework for the description of health and health-related conditions. The ICF includes all aspects of human health and some health-relevant components related to well-being and describes them in terms of health domains and health-related domains. These domains describe changes in physiological functions and body structures, describing the ability of a person with a certain health condition to influence their environment and performance.⁽⁹⁾

This is a very extensive classification, which may be one of the reasons for its little use in clinical practice, so WHO and its collaborators have developed smaller code lists called Score Sets. Score Sets arise from several processes, which require several steps and are still in the process of development and study, with the aim of facilitating its applicability in clinical practice, in research and service management.⁽¹⁰⁻¹¹⁾

In this way, it is intended to speed up the assessment of the person with stroke, since, instead of evaluating all aspects of their functionality; the most significant categories for them are evaluated. The selection of codes for the elaboration of the Score set based on the ICF will serve as a minimum standard for the assessment and documentation of functionality and health in clinical studies, clinical meetings and comprehensive multiprofessional assessment.⁽¹¹⁾

The Stroke Score Set theme based on the ICF was chosen because of its current prevalence, which gives it special importance in the field of rehabilitation nursing. Thus, this study aims to identify the most appropriate Score Set based on the ICF for assessing functionality and health-related aspects of stroke patients.

METHOD

It was decided to carry out a SLR, as it is intended to answer a clearly formulated question using systematic and explicit methods to identify, select and critically evaluate relevant research and collect and analyze data from studies included in the review.⁽¹²⁾ With this methodology, the strategies used reduce biases in the selection of articles and, based on a well-defined question, synthesize the results of primary studies in a given area.⁽¹³⁾

For an analysis of all the available evidence and, in order to understand if a practice is effective or not, it is necessary to follow several steps: 1. Elaboration of the research question; 2. Literature search; 3. Selection of articles; 4. Data extraction; 5. Assessment of methodological quality; 6. Data synthesis; 7. Assessment of the quality of evidence; and 8. Writing and publication of results.⁽¹⁴⁾

The research question was elaborated according to the recommendations of the Joanna Briges Institute (JBI)⁽¹⁵⁾ from the PICo⁽¹⁶⁾ strategy (Population, Interest phenomenon, Context). Each dimension of the PICo contributed to the definition of inclusion criteria, namely Population (P) Person with stroke; Interest phenomenon (I) ICF Score set; Context (Co) Community. What is the most suitable ICF-based Score Set for the person with stroke in the community?

As a form of exclusion from the studies, the criteria used were, language other than English, Spanish, Portuguese, studies referring to children that are not provided in full texts, studies that do not address the topic of ICF in people with stroke and, finally, articles

that present quality criteria below 75%, in the JBI grids.⁽¹⁵⁾

The research was carried out from October 19th to November 19th, 2017, in the Medline, SciELO, virtual health library, EBSCO, Nurses Order and General Directorate of Health databases, including articles and books published between 2013 and 2017.

The descriptors were validated in the platforms, Health Sciences Descriptors (DeSC) and Medical Subject Headings 2017 (MeSH), using a Boolean equation in the research, (International Classification of Functioning, Disability and Health) OR (ICF)) AND (Stroke).

After outlining the strategy, research and selection of articles were carried out according to the indications of the PRISMA recommendations⁽¹⁷⁾ (Figure I).

The results were obtained by reading the title, after the abstract and later, the full text. For greater credibility of the study, the results were compared and the agreement between the researchers was verified.

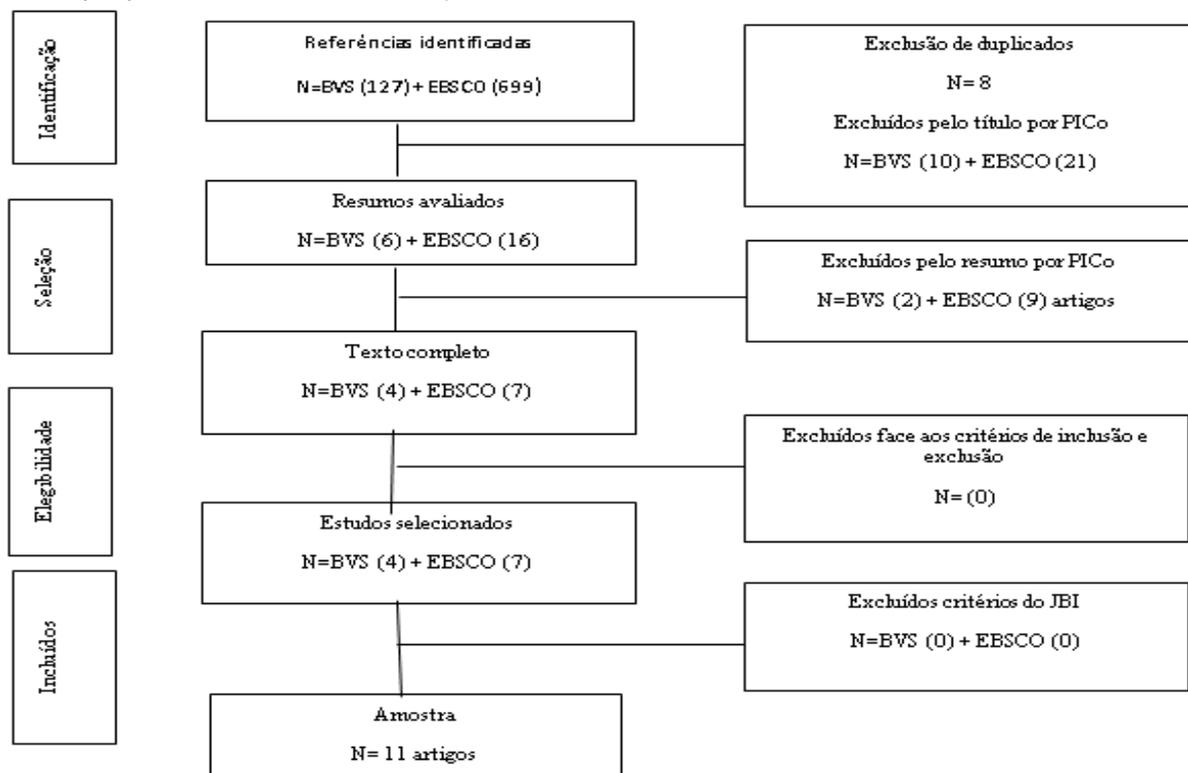


Figure I – Identification, analysis and selection of articles

RESULTS

Out of the 11 articles analyzed, three were published in 2013,⁽¹⁸⁻²⁰⁾ three in 2014,⁽²¹⁻²³⁾ three in 2015,⁽²⁴⁻²⁶⁾ one in 2016⁽¹⁰⁾ and one in 2017⁽²⁷⁾.

As far as countries of origin Brazil,^(18,20,27) USA,⁽²¹⁾ Sweden,^(19,22) Spain,⁽²⁴⁾ Germany⁽²⁶⁾ China^(10,23) and Finland⁽²⁵⁾ were included.

The samples used in the analyzed studies ranged between 12⁽¹⁸⁾ and 227⁽¹⁰⁾ persons diagnosed with stroke.

The studies analyzed are descriptive quantitative studies^(10,19,20-21,23-27) and qualitative studies,^(19,22) with level of evidence III.

After analyzing the different articles, their objectives, their level of evidence were identified and the ICF codes mentioned in each article were grouped (Chart 1).

Author/ Year/Countr y	Population(Sa mple)	Objectives	NE	Category Codes CIF
Campos et al. (2013), Brazil ⁽¹⁸⁾	12 persons with stroke	To compare the instruments for the assessment of sleep, cognition and function with the ICF in people with stroke	III	Body functions - b110, b114, b117, b134, b140, b144, b156, b164, b167, b176, b180, b210, b310, b320, b510, b525, b620, b710, b730, b760, b770 Activity and Participation d115, d160, d166, d170, d172, d175, d210, d230, d310, d345, d410, d420, d430, d440, d445, d450, d455, d465, d510, d520, d530, d540, d550, d570
Paanalahti, et al. (2013), Sweden ⁽¹⁹⁾	22 persons with a previous diagnosis of stroke .	To apply and to understand the ICF code to persons, living in a community, who have survived stroke.	III	Body functions - b110, b126, b130, b134, b140, b144, b152, b164, b167, b210, b215, b260, b265, b270, b280, b310, b320, b330, b410, b455, b510, b525, b640, b710, b715, b730, b735, b740, b755, b760, b770
Riberto, et al. (2013) Brazil ⁽²⁰⁾	132 persons with stroke in 3 Brazilian health institutions.	To validate a set of CIF codes for stroke, checking the frequency of problems in each individual.	III	Body functions - b110, b114, b117, b126, b130, b134, b140, b144, b147, b152, b156, b160, b164, b167, b172, b176, b180, b210, b215, b230, b235, b240, b265, b270, b280, b310, b320, b330, b340, b410, b415, b420, b430, b435, b440, b450, b455, b510, b515, b525, b530, b535, b540, b545, b550, b620, b630, b640, b710, b715, b730, b735, b740, b750, b755, b760, b770, b810 Body structure- s110, s410, s720, s730, s750 Activity and participation - d115, d120, d130, d135, d155, d160, d166, d170, d172, d175, d117, d210, d220, d230, d240, d310, d325, d330, d335, d345, d350, d360, d410, d415, d420, d430, d440, d445, d450, d455, d460, d465, d470, d475, d510, d520, d530, d540, d550, d560, d570, d620, d630, d640, d710, d750, d770, d845, d850, d860, d870, d910, d920, d930, d940 Environment - e110, e115, e120, e125, e135, e150, e155, e165, e210, e240, e250, e310, e315, e320, e325, e340, e355, e360, e410, e415, e420, e425, e440, e450, e455, e460, e465, e515, e525, e535, e540, e550, e555, e570, e575, e580, e590
Beninato, Parikh & Plummer, (2014), USA ⁽²¹⁾	43 persons with a previous diagnosis of stroke.	To analyze the "Stroke Impact Scale - 16" in relation to individuals with stories of falls.	III	Body functions - b525, b620 Activity and participation - d415, d510, d530, d420, d450, d455, d430, d540, d640, d620
Paanalahti, et al. (2014) Sweden ⁽²²⁾	22 persons with a previous diagnosis of stroke .	To validate a set of ICF codes for problems related to daily life on person with stroke.	III	Body functions - b110, b114, b117, b126, b130, b134, b140, b144, b152, b160, b164, b172, b176, b180, b210, b215, b220, b240, b260, b265, b270, b280, b320, b330, b410, b420, b435, b455, b510, b530, b550, b710, b730, b735, b740, b760, b765, b770, b780, b830 Body structure - s110, s410, s730, s750 Activity and participation - d110, d155, d160, d166, d170, d172, d175, d177, d210, d220, d230, d240, d310, d325, d330, d345, d350, d360, d410, d415, d420, d430, d440, d445, d450, d455, d460, d465, d470, d475, d510, d520, d530, d540, d550, d560, d570, d620, d630, d640, d710, d750, d760, d850, d855, d910, d920
Wang et al. (2014) China ⁽²³⁾	208 persons with stroke	To verify the feasibility and validity of the ICF content describing the relevant aspects of body functions and environmental factors in stroke victims.	III	Body functions - b110, b114, b117, b126, b130, b134, b140, b144, b152, b156, b164, b167, b172, b176, b180, b210, b215, b260, b265, b270, b280, b310, b320, b330, b410, b415, b420, b455, b510, b525, b620, b640, b710, b715, b730, b735, b740, b750, b755, b760, b770 Body structure - s110, s410, s720, s730, s750 Activity and participation - d115, d155, d160, d166, d170, d172, d175, d210, d220, d230, d240, d310, d315, d325, d330, d335, d345, d350, d360, d410, d415, d420, d430, d440, d445, d450, d455, d460, d465, d470, d475, d510, d520, d530, d540, d550, d570, d620, d630, d640, d710, d750, d760, d770, d845, d850, d855, d860, d870, d910, d920, Environment - e110, e115, e120, e125, e135, e150, e155, e165, e210, e310, e315, e320, e325, e340, e355, e360, e410, e420, e425, e440, e450, e455, e460, e510, e525, e535, e540, e550, e555, e570, e575, e580, e590
Benito García, et al. (2015) Spain ⁽²⁴⁾	24 persons with stroke	To evaluate the effectiveness of the rehabilitation program based on Bobath's concept.	III	Body functions - b7302, b4500, b4501, b4502, b4503
Tarvonen-Schröder, et al. (2015). Finland ⁽²⁵⁾	62 persons with stroke	-Comparison between the MIF and the ICF in assessing the ability and performance of a person with stroke.	III	Activity and participation - d330, d530, d450, d550
Ottiger et al. (2015), Germany ⁽²⁶⁾	102 persons with stroke	To develop and to assess the reliability and validity of a scale - LIMOS; To evaluate the correlation between LIMOS and MIF.	III	Activity and participation - d510, d598
Chen et al. (2016). China ⁽¹⁰⁾	227 persons with stroke	To investigate how professionals' experience in ICF valuation determines its reliability.	III	Body functions - b110, b114, b140, b144, b167, b730 Body structure - S110, S730 Activity and participation - d310, d330, d450, d510, d530, d540, d550 Environment - e310, e355, e580
Santana & Chun (2017), Brazil ⁽²⁷⁾	50 persons, over 18 years old, diagnosed with stroke	To evaluate and to classify aspects of language, functionality and participation of people with stroke based on the ICF	III	Body functions - b114, b144, b167, b176, b230, b310, b320, b330 Activity and participation - d160, d310, d315, d325, d330, d345, d350, d360, d450, d750, d760, d860, d910, d920

Table 1 – Systematization of the information required by the article

After analyzing the 11 articles, it appears that 160 ICF codes are mentioned, divided by Body Functions (53 codes, 33%), Activities and Participation (61 codes, 38%), Environmental Factors (40 codes, 25%) and Structures of the Body (6 codes, 4%).

Codes were selected with a frequency $\geq 50\%$ and a total of 21 codes were identified, of which 6 codes (29%) related to the Body Functions component, 13 codes (61%) related to the Activities and Participation component, 2 codes (10%) referring to the Environmental Factors component.

In a comparative analysis of all the codes obtained, with codes with a frequency $\geq 50\%$, we can conclude that the Body Functions and Activities and Participation are the most evident categories, with a percentage of 33% and 38%, respectively. With regard to codes with a frequency $\geq 50\%$, it was found that Activities and Participation (61%) have greater evidence than body functions (29%). Regarding the Environmental Factors and Structures of the Body, they continued to have less evidence in patients with stroke, both in all articles and in $\geq 50\%$ (Table 2).

Components	Number of articles	Total of analyzed articles		Analyzed articles > or = 50%	
		Nº of codes used	% of codes used	Nº of codes used	% of codes used
Body functions	11	53	33%	6	29%
Activity and participation	11	61	38%	13	61%
Environmental factors	11	40	25%	2	10%
Body structure	11	6	4%	0	

Table 2 – Frequency of occurrence of codes

The proposed core set for people with stroke features twenty-one main codes. The body functions component has six codes: b144 Memory functions, b730 Muscle strength functions, b114 Orientation functions, b140 Attention functions, b167 Mental language functions, b320 Joint functions.

In the Activities and Participation component, 13 codes are highlighted, d450 walking, d510 Washing, d530 Care related to the excretion processes, d330 Speaking, d540 Dressing, d550 Eating, d160 Focusing attention, d310 Communicating and receiving oral messages, d345 Writing messages, d410 Change basic body position, d420 Auto-transfers, d430 lifting and carrying objects and d455 moving.

In the Environmental Factors component, 2 codes are highlighted, e355 Health Professionals, e580 Services, Systems and Policies related to health (Table 3).

Components	Codes and Categories	(n)	Percentage %	
Body functions	b144	Memory Functions	7	64%
	b730	Muscle strength functions	6	55%
	b114	Guidance functions	6	55%
	b140	Functions of attention	6	55%
	b167	Mental functions of language	6	55%
	b320	Joint functions	6	55%
Activity and participation	d450	Walking	9	82%
	d510	Washing up	8	73%
	d530	Care related to excretion processes	8	73%
	d330	Speaking	7	64%
	d540	Dressing up	7	64%
	d550	Eating	7	64%
	d160	Focus attention	6	55%
	d310	Communicate and receive oral messages	6	55%
	d345	Writing messages	6	55%
	d410	Changing basic body position	6	55%
	d420	Auto-transfers	6	55%
Environmental factors	d430	Lifting and transporting objects	6	55%
	d455	Moving around	6	55%
	e355	Health professionals	6	55%
	e580	Health-related services, systems and policies	6	55%

Table 3 – Score Set ICF Stroke

DISCUSSION

In this SLR, 11 articles were included, nine present designs that fit a quantitative approach. Study designs are heterogeneous, which may limit the results of this study.

It was possible to identify the score set most frequently used in studies carried out in people with stroke.

It should be noted that body structures have no evidence in the score set, as there is no code with a percentage $\geq 50\%$, so it seems that health professionals who care for people with stroke value Body Functions and Activities and Participation, in detriment of the Structures of the Body.

The results obtained in this SLR corroborate those obtained by Geyh et al.⁽²⁸⁾ since, as in the score set presented here (Table 3), the greatest evidence lies in the Body Functions and Activities and Participation.

However, these authors⁽²⁸⁾ evidence two codes in the structures of the body, s730 Structure of the Upper Limb and s110 Structure of the Brain, which, even not being included in the score set for this SLR, are the codes with the highest percentage (47% and 36%, respectively) within the Structures of the Body, accompanied by the code s750 Structure of the lower limb (36%).

In a study carried out in Sweden⁽²⁹⁾ the most affected functions after 6 months were: b130 Energy and conduction functions, b144 memory function, b455 exercise tolerance functions, b730 muscle strength, b740 muscle endurance functions, and b770 functions of the gait pattern. In terms of activity and participation, the most frequently mentioned ICF codes were: d630 preparing meals, d640 performing domestic tasks, d920 recreation and leisure. At least 50% of persons after stroke had problems at work, namely, d220 multiple tasks, d440 use fine hand movements, d450 walking and d460 moving in different places.

This SLR corroborates the results found in other studies carried out before 2013 (28,0) in which the functions of orientation, memory and attention, language and muscle strength stood out in the dimension of body functions; in activities and participation, the main areas mentioned were walking, washing, talking, dressing, eating, communicating and receiving oral messages and writing messages; and in the environment dimension, health professionals were mentioned, as well as health-related services, systems and policies. Furthermore, in the study by Seyh et al.⁽²⁸⁾ at the level of the environment dimension, they address the immediate family (e310) and in the body structure they refer to the brain (s110).

As limitations of this study, we considered the heterogeneity of the designs of the included studies and the fact that one of the inclusion criteria was the availability of full texts.

Body functions are the physiological functions of organic systems (ICF) that, even if the body structures are altered due to stroke sequelae, the person is able, through a rehabilitation program, to overcome these changes and acquire skills to rebuild their autonomy and independence. For this reason, even if a person has a change in an organ or member (Body Structures), the most important thing is their independence and the ability to perform tasks and keep them involved in their everyday activities (Activities and Participation). These activities are related to the basic and instrumental activities of daily living,⁽³¹⁾ in which the specialist nurse in rehabilitation nursing plays an important role in enabling the person through teaching, instruction and training in activities of daily living.⁽³²⁾

Implications for practice

With this SLR, it was possible to increase knowledge in nursing, as well as to contribute to simplifying the assessment of the persons functionality after stroke, since the most used ICF codes were highlighted, thus identifying the ICF Score Set for this specific

population. In future investigations, it is recommended that content validation be performed by a panel of rehabilitation nurses (Delphi technique)⁽²⁸⁾ and then clinical validation⁽³⁰⁾ in order to verify the adequacy of the ICF score set that allows for the description health and health-related conditions, namely the functionality of people after stroke.

In the implementation and operationalization of the ICF, measures based on the ICF must be developed and detailed manuals on evaluation and completion must be drawn up in order to ensure inter-rater reliability.⁽³³⁾

CONCLUSIONS

In this SLR, 11 studies were analyzed identifying 160 ICF codes used to classify and assess the characteristics of post-stroke patient.

After analyzing all the codes, more than 50% of the codes were selected, making a total of 21, distributed by the categories Body Functions, Activities and Participation and Environmental Factors, thus constituting the score set for patients with stroke.

It is important to introduce this information into the practice of specialist nurses in rehabilitation nursing, since the standardized classifications and languages describe and organize the data, in order to highlight the health gains sensitive to rehabilitation nursing care

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REEDUCAÇÃO FUNCIONAL RESPIRATÓRIA NO CLIENTE SUBMETIDO A GASTRECTOMIA: PROGRAMA DE INTERVENÇÃO PRÉ E PÓS-OPERATÓRIO

REEDUCACIÓN FUNCIONAL RESPIRATORIO EN CLIENTE SOMETIDO A GASTRECTOMÍA:
PROGRAMA DE INTERVENCIÓN PRE Y POSTOPERATORIO

FUNCTIONAL REEDUCATION OF BREATHING IN THE CLIENT SUBMITTED TO GASTRECTOMY:
PRE AND POSTOPERATIVE INTERVENTION PROGRAM

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Eduardo Soares¹; Salete Soares¹

1 - IPO-Porto; Escola Superior de Enfermagem do Porto; 2 - Escola Superior de Saúde - Instituto Politécnico de Viana do Castelo

RESUMO

Objetivo: Analisar os efeitos de um programa de reeducação funcional respiratória pré e pós-operatório na dor, frequência respiratória e saturação de oxigénio do cliente submetido a gastrectomia programada.

Método: Estudo quase-experimental e longitudinal, sustentado num paradigma quantitativo, com uma amostra de 60 clientes distribuídos por dois grupos: 30 controlo e 30 intervenção.

Resultados: Baixos níveis de dor ($M < 2.07$) estiveram presentes no estudo, com vantagens estatisticamente significativas para os clientes do grupo de intervenção, no momento da alta e consulta de pós-operatório ($p = 0,016$ e $p = 0,002$, respetivamente). Existe um impacto imediato vantajoso na saturação de oxigénio após a realização do programa, ($p < 0,001$, em todos os momentos de avaliação). A frequência respiratória manteve-se normal, não se verificando efeitos da intervenção ($p > 0,05$).

Conclusão: A implementação do programa revelou benefícios, sobretudo pós-operatórios, com diminuição do nível de dor e aumento da saturação de oxigénio. Não se traduziram efeitos do programa na frequência respiratória. A sua característica de continuidade no tempo traz vantagens para os clientes.

Palavras-chave: gastrectomia; reeducação funcional respiratória; enfermagem em Reabilitação.

RESUMEN

Objetivo: Analizar los efectos de un programa de reeducación funcional respiratoria previa y postoperatoria en el dolor, frecuencia respiratoria y saturación de oxígeno del cliente sometido a gastrectomía programada.

Método: Estudio casi experimental y longitudinal, sostenido en un paradigma cuantitativo, con una muestra de 60 clientes distribuidos por dos grupos: 30 control y 30 intervención.

Resultados: Bajos niveles de dolor estuvieron presentes en el estudio, con ventajas estadísticamente significativas para los clientes del grupo de intervención, en el momento de la alta y consulta de postoperatorio ($p = 0,016$ y $p = 0,002$, respectivamente). Existe un impacto inmediato ventajoso en la saturación de oxígeno después de la realización del programa, ($p < 0,001$, en todos los momentos de evaluación). La frecuencia respiratoria se mantuvo normal, no ocurriendo efectos de la intervención ($p > 0,05$).

Conclusión: La implementación del programa reveló beneficios, sobre todo postoperatorios, con disminución del nivel de dolor y aumento de la saturación de oxígeno. No se tradujeron efectos del programa en la frecuencia respiratoria. Su característica de continuidad en el tiempo trae ventajas para los clientes.

Palabras clave: gastrectomía; reeducación funcional respiratorio; enfermería en rehabilitación.

ABSTRACT

Aim: To analyze the effects of a pre and post-operative breathing functional reeducation program in pain, respiratory rate and O₂ saturation in the health/illness transition process of the client submitted to an elective gastrectomy.

Method: A quasi-experimental and longitudinal study, based on a quantitative paradigm, with a sample of 60 clients distributed in two groups: 30 control and 30 intervention.

Results: Low levels of pain were present in the study, with statistically significant advantages for clients of the intervention group at discharge and postoperative consultation ($p = 0.016$ and $p = 0.002$, respectively). There is an immediate beneficial impact on oxygen saturation after the completion of the program, ($p < 0.001$, at all times of assessment). The respiratory rate remained normal, with no effect of the intervention ($p > 0.05$).

Conclusion: The implementation of the program revealed benefits, mainly post-operative, with decreased pain

level and increased oxygen saturation. There were no program effects on respiratory rate. Its characteristic of continuity in time brings advantages to the clients.

Key words: gastrectomy; respiratory functional of breathing; rehabilitation nursing.

INTRODUCTION

Gastric cancer, also called stomach cancer, occurs when there is an abnormal proliferation of constituent cells in the stomach ⁽¹⁾. It presents disturbing epidemiological values, with approximately one million new cases diagnosed worldwide in 2012 ⁽²⁾. In the northern region of Portugal in 2015 it was the fourth malignant tumor to affect more men and women, with an incidence rate of 8.3% and 5.5%, respectively ⁽³⁾. It is a public health problem with a tendency to worsen in the near future, and it is expected that a considerable percentage of population will develop this neoplasm, mainly due to eating, smoking, alcoholic and sedentary habits ⁽⁴⁾.

Gastric cancer has a great personal and social impact due to its hostility as a disease and its aggressiveness towards treatments, leading the client to experience a health/disease transition ⁽⁵⁾. Gastrectomy is the most common treatment for this type of tumor, being a surgical procedure in which there is partial or total removal of the stomach and adjacent lymph nodes ⁽¹⁾.

It is an aggressive surgery that causes anxiety situations in clients resulting from feelings of loss of control, failure and fear ⁽⁶⁾. In addition to the psychological impact, associating the anesthetic and surgical act, there is an effect on respiratory dynamics, contributing to the increased risk of postoperative pulmonary complications ^(7,8).

This impairment in respiratory dynamics occurs due to factors intrinsic to the client (age, smoking, obesity, chronic lung disease, malnutrition, state of consciousness, alcoholism, sedentary lifestyle and chest deformities) ^(8,9,10,11) and related factors with the surgical procedure (hypoventilation, immobilization, central nervous system depression, intubation, ineffective cough and phrenic nerve inhibition and consequently diaphragmatic paresis) ^(11,12,13,14).

There is a consensus that pulmonary complications arising in the postoperative period continue to influence morbidity, mortality and length of hospital stay, despite progress in the intervention of health professionals in the pre, intra and postoperative periods ^(11,15, 16,17). Respiratory Functional Re-education Programs (RFR) have been increasingly shown to be beneficial, both in the prevention of postoperative pulmonary complications, and in their effective recovery ⁽¹⁸⁾.

RFR, also known as respiratory kinesitherapy, is a therapy that fundamentally uses movement in its intervention and acts on the mechanical phenomena of breathing, that is, on external ventilation and, through it, on alveolar ventilation ⁽¹⁹⁾.

The specialist nurse in rehabilitation nursing assumes a fundamental role here, as it is a professional whose function is to care for, to train and to maximize the

functionality of clients throughout the life cycle ⁽²⁰⁾, and can intervene with these skills in preventing or correcting the postoperative pulmonary complications, helping clients to experience a healthy transactional process ⁽⁵⁾.

The aim of this study is to analyze the effects of a pre- and postoperative RFR program on pain, respiratory rate and O₂ saturation in the health/disease transition process of the client undergoing scheduled gastrectomy.

In this logic of transactional nursing care and RFR intervention in clients undergoing gastrectomy, the starting question arises: what is the effect of a pre- and postoperative RFR program on pain, respiratory rate and O₂ saturation in the health/ disease, of the client undergoing scheduled gastrectomy?

METHOD

To achieve the objective of the study, we developed an investigation that fits into a quantitative, quasi-experimental and longitudinal paradigm.

As a quasi-experimental study, an RFR program was used as an intervention. Its conception was a construct that we prefer to systematize and phase, in order to provide it with methodological and clinical rigor, pertinence, objectivity and applicability. In the first phase, we carried out the construction of the program, using literature analysis. In the second phase, it was analyzed by an individual panel of experts. The third phase referred to the analysis and discussion of the experts' criticisms and suggestions. In the fourth phase, there was a new evaluation of the experts according to the changes resulting from their criticisms, where the program was approved by them. The last phase was the pre-test of 3 customers with positive feedback at the end, so the program design was completed.

The RFR program, conceived according to the above systematization, intended to restore and maximize respiratory performance, avoiding respiratory complications related to the surgical procedure and facilitating the health/disease transition process the client was experiencing.

The RFR program included: rest and relaxation techniques (lying down, sitting and standing); awareness of breathing times and breathing control; abdominal diaphragmatic breathing exercises and bilateral lower costal breathing; opening of rib cage exercises, with a stick; directed cough with containment of the surgical wound; change of position, active body movement and postural correction; and breath control in exertion, walking, and climbing and descending of stairs.

It was carried out by the principal investigator in order to cause as much uniformity as possible. The average duration of the program was 30 to 45 minutes, being adjusted to the client's clinical situation. As for the frequency of exercises, it was a work of agreement between the researcher and the client, taking into account the client's availability and physical condition.

With this research methodology, using the RFR program presented, we intended to test the following hypotheses:

H 1: The pre- and postoperative RFR program reduces client pain undergoing scheduled gastrectomy;

H 2: The pre- and postoperative RFR program improves respiratory rate of client undergoing scheduled gastrectomy;

H 3: The pre- and postoperative RFR program improves O2 saturation of client undergoing scheduled gastrectomy.

Since the research design is a logical plan, conceived by the researcher, in order to reach valid answers to the formulated hypotheses, we present in Figure 1 the design of our study.

	Pre-op. consultation		Home	Day before surgery		1st day post-op. and remaining internment		Home after discharge	Post-op. consultation
	O1	X1		X1	O2	X1	O2		
Intervention group	O1	X1	X2	X1	O2	X1	O2	X2	O,2
Control group	O1		--	O2		O2		--	O2

O1 - Initial data collection | O2 - Data collection
 X1 - RFR program with researcher | X2 - RFR program without investigator

Figure 1 – Research design

The RFR program first took on a phase of teaching clients in the intervention group and evaluating this teaching, right after the preoperative consultation. This program was continued at home, without the investigator. On the day before surgery and during the remaining hospital stay, except for the day of surgery, there was daily intervention of the RFR program with the investigator. After discharge, the RFR program continued without the investigator until the moment of the postoperative consultation, the end of the study.

For this study, the sample was non-probabilistic, accidental, because it consisted of clients who underwent scheduled gastrectomy in the surgical service of a hospital in the north of the country, in the period in which data collection took place (from 1-11-2016 to 17-3-2017) and that met the inclusion criteria defined below: clients with scheduled gastrectomy, with general anesthesia prediction, conscious and oriented in time and space, no pulmonary metastases, no physical dependencies, with more than 18 years-old and who agreed to participate in the study with informed consent.

As this is a study with two groups (intervention and control), the distribution of clients occurred according to the hospital's card number. If odd belonged to intervention group, if even to the control.

The sample consisted of 60 participants, 30 from the intervention group and 30 from the control group.

A data collection instrument was built for the study, consisting of a part of sociodemographic and clinical characterization and another part of recording grids of oxygen saturation, respiratory rate and pain (variables dependent on the study). Pain was assessed using the numerical pain scale.

Statistical analysis of data was performed using SPSS[®] version 23.0. The accepted significance level was 5%, with a 95% confidence interval.

Data processing was performed in two ways: through descriptive and inferential analysis.

In descriptive statistics of categorical variables, we used tables of absolute and relative frequencies, which were accounted for in each study group. For quantitative variables, we used the minimum, maximum, mean, median, standard deviation and interquartile range.

In the inferential analysis, we performed comparison tests between the two groups. In order to verify whether the two samples under study differed from each other, the chi-square test was used for categorical variables. When the dependent variable was quantitative, to verify differences between groups, the t-Student parametric test was used for two independent samples. When the assumption of normality of the samples was not validated, the non-parametric Mann-Whitney U test was used.

In order to analyze the differences between the various evaluation moments for all the variables of interest, in the case of more than two moments, the ANOVA was used for repeated measures, when the normality assumption was fulfilled, and when it is not found fulfilled, the non-parametric Friedman test was used.

The study was authorized by the institution's ethics committee and board of directors, and informed consent was obtained from all participants.

RESULTS

Regarding age, the clients in the control group had values between 33 and 86 years-old (M=65.30;

SD=13.68), those in the intervention group were aged between 40 and 85 years-old (M= 62.73; SD=12.52). There were no significant differences between the two groups in terms of age [t(58)=0.76; p=0.451].

With regard to gender, the control group comprised 18 (60.0%) men and 12 (40.0%) women, the intervention group consisted of 14 (46.7%) men and 16 (53.3 %) women. There were no significant differences between the two groups regarding gender [$\chi^2(1) = 1.07$; p=0.301].

As in age and gender, in the remaining variables of sociodemographic and clinical characterization, there were no significant differences between the two groups. Due to its extensibility, we do not present the results in detail in this article. For a better explanation of the results, we chose to make a presentation according to the variables under study.

Pain

We present the results obtained in relation to pain in two different scenarios. Table 1 shows the statistical

analysis carried out between control and intervention groups for each moment of pain assessment. Table 2 shows the statistical analysis at temporal level for control and intervention groups.

It was found that clients in the control group reported more pain at the time of discharge and postoperative consultation, and the differences observed between the two groups were significant (U=304.00; p=0.016 and U=288.00; p=0.002, respectively). In the remaining moments (preoperative visit, the day before surgery and the 1st postoperative day), there were no statistically significant differences.

According to table 2, statistically significant differences were found between pain assessments, both for the control group and for the intervention group [$\chi^2(4) = 49.01$; p<0.001 and $\chi^2(4) = 49.63$; p<0.001, respectively].

		Pre-op. consultation		Day before surgery		1 st post-op.		Discharge		Post-op. consultation	
		C	I	C	I	C	I	C	I	C	I
Pain	Minimum	0	0	0	0	0	0	0	0	0	0
	Maximum	3	0	2	0	7	5	5	2	4	1
	Median	0.00	0.00	0.00	0.00	2.00	1.50	1.00	0.00	0.00	0.00
	Interquartile range	0.00	0.00	0.00	0.00	3.25	3.00	3.00	1.00	2.00	0.00
	Average	1.00	0.00	0.07	0.00	2,07	1.60	1.53	0.43	0.83	0.10
	Standard deviation	0.55	0.00	0.37	0.00	1.96	1.63	1.72	0.68	1.18	0.31
Comparison between groups		U= 435.00 p=1.000		U =435.00 p=1.000		U =395.50 p=0.411		U =304.00 p=0.016		U= 288.0 p=0.002	

Subtitle: C-Control group; I - Intervention group; U- *Mann-Whitney U* test statistic; p- value of test

Table 1 - Analysis of differences between the intervention group and the control group in pain

	Pre-op consultation. Average order	The day before Average order	1 st post-op. Average order	Discharge Average order	Post-op consultation. Average order	Comparison
Pain (Control)	2.23	2.18	3.95	3.60	3.03	$\chi^2(4) = 49.01$ p < 0.001
Pain (Intervention)	2.48	2.48	4.03	3.27	2.73	$\chi^2(4) = 49.63$ p < 0.001

Subtitle: χ^2 - *Friedman's* test statistics; p- value of test

Table 2 - Analysis of differences between time points, in pain assessment, for the control group and for the intervention group

Respiratory frequency

As for the respiratory rate, we present table 3 that shows the results making the statistical analysis between the study groups at each moment and table 4 that exposes the differences at the longitudinal level, that is, over time separately from the control and intervention groups.

No statistically significant differences were found between clients in the control and intervention groups in terms of the respiratory rate recorded at any of the evaluation moments (all p>0.05), as shown in table 3.

From the analysis of table 4, we can see that, in relation to the control group, no statistically significant differences were found between the

respiratory rate assessments performed at the five time points [$\chi^2(4)=3.62$; $p=0.459$]. With regard to the intervention group, statistically significant differences

were found in respiratory rate among the five assessments [$\chi^2(4)=16.18$; $p=0.003$].

		Pre-operative consultation		The day before surgery		1 st post-op.		Discharge		Post-op. consultation	
		C	I	C	I	C	I	C	I	C	I
Respiratory frequency	Minimum	14	14	16	14	14	14	14	16	14	16
	Maximum	20	20	20	22	24	20	22	20	20	20
	Median	16.00	16.00	17.00	18.00	17.00	18.00	16.00	16.00	17.00	16.00
	Interquartile range	2.00	2.00	2.00	2.00	4.00	4.00	2.00	2.00	2.00	2.00
	Average	16.80	16.53	17.20	17.40	17.93	17.73	16.87	16.73	17.07	16.60
	Standard deviation	1,54	1,38	1.35	1,83	2,90	2.08	1.87	1.11	1.36	1.07
Comparison between groups		U= 407,00 p=0.490		U =433.50 p=0.787		U= 450.00 p=1.000		U =436.00 p=0.832		U =355.50 p=0.121	
Subtitle: C-control group; I - intervention group; U- Mann-Whitney U test statistics; p- value test											

Table 3 - Analysis of differences between intervention group and control group in respiratory rate

	Pre.op. consultation Average order	The day before surgery Average order	1 st post-op. Average order	Discharge Average order	Post-op. consultation. Average order	Comparison
Respiratory Freq. (Control)	2.73	3.15	3.33	2.87	2.92	$\chi^2(4) = 3.62$ $p = 0.459$
Respiratory Freq. (Intervention)	2.50	3.33	3.67	2.85	2.65	$\chi^2(4) = 16.18$ $p = 0.003$
Subtitle: χ^2 - Friedman's test statistics; p- value of test						

Table 4 - Analysis of differences between temporal moments, in the assessment of respiratory rate, for control group and for intervention group

Oxygen Saturation

Initially we show the results regarding the initial O₂ saturation, that is, before the execution of the RFR program. Afterwards, we present the values related to the final saturation, and finally, the comparison between the initial and final O₂ saturation, in relation to the clients in the control group.

It was found that the clients in the intervention group had a higher initial saturation, at the time of discharge and postoperative consultation, and the differences observed between the two groups were

significant at these times (U=293.50; $p=0.018$ and U=164.00; $p<0.0001$, respectively). In the remaining moments, the differences were not significant, as shown in table 5.

Analyzing table 6, we notice that statistically significant differences were found between the initial oxygen saturation assessments carried out at the five time points, both for the control group and for the intervention group [$\chi^2(4)=33.36$; $p<0.001$ and $\chi^2(4)=67.71$; $p<0.001$, respectively].

		Pre-operative consultation		The day before surgery		1 st post-op.		Discharge		Post-op. consultation	
		C	I	C	I	C	I	C	I	C	I
Initial O ₂ saturation	Minimum	95	94	95	95	92	93	95	95	95	96
	Maximum	100	99	100	100	98	97	100	99	100	100
	Median	97	97	97	98	96	95.5	96.5	97.5	97	98
	Interquartile range	2.00	2.00	2.00	2.25	3.00	2.00	2.00	1.25	1.25	1.00
	Average	97.07	96.97	97.10	97.70	95.50	95,57	96.53	97.27	97.23	98.47
	Standard deviation	1.39	1.33	1.40	1.42	1.48	1,19	1,31	1,23	1.04	0.90
Comparison between groups		U =443.00 p=0.915		U= 342.50 p=0.105		U= 445.00 p=0.939		U= 293.50 p=0.018		U= 164.00 p< 0.001	
Subtitle: C-control group; I - intervention group; U- Mann-Whitney U test statistics; p- value test											

Table 5- Analysis of differences between intervention and control groups in initial oxygen saturation

	Pre-op consultation. Average order	The day before Average order	1 st post-op. Average order	Discharge Average order	Post-op. consultation. Average order	Comparison
Initial O ₂ Sat. (Control)	3.45	3.32	1.78	2.73	3.72	$\chi^2(4) = 33.36$ p < 0.001
Initial O ₂ Sat. (Intervention)	2.73	3.75	1.28	3.03	4.20	$\chi^2(4) = 67.71$ p < 0.001

Subtitle: χ^2 - Friedman's test statistics; p - value of test

Table 6 - Analysis of differences between time points, in assessment of initial oxygen saturation, for control group and for intervention group

Regarding the final oxygen saturation, it can be seen from the analysis of table 7 that statistically significant differences were found at all evaluation moments, with the clients in the group

of intervention showed higher saturation than clients in the control group at all times (all p<0.05).

		Pre-operative consultation		The day before surgery		1 st post-op.		Discharge		Post-op. consultation	
		C	I	C	I	C	I	C	I	C	I
Final O ₂ Saturation	Minimum	95	98	95	98	92	97	95	98	95	96
	Maximum	100	100	100	100	98	100	100	100	100	100
	Median	97	100	97	100	96	97	96,5	100	97	98
	Interquartile range	2.00	2.00	2.00	2.00	3.00	2.50	2.00	0.25	1.25	1.50
	Average	97.07	99.37	97.10	99.53	95.50	98.80	96.53	99.60	97.23	98.47
	Standard deviation	1.39	0.76	1.40	0.68	1.48	0.96	1.31	0.77	1.04	0.90
Comparison between groups		U =77.50 p<,0001		U= 59.00 p<,0001		U =16,50 p<,0001		U =34.50 p<,0001		U= 164.00 p<,0001	

Subtitle: C-control group; I - intervention group; U- Mann-Whitney U test statistics; p- value test

Table 7 - Analysis of differences between intervention and control groups in final oxygen saturation

	Pre-op consultation. Average order	The day before Average order	1 st post-op. Average order	Discharge Average order	Post-op. consultation. Average order	Comparison
Final O ₂ Sat. (Control)	3.45	3.32	1.78	2.73	3.72	$\chi^2(4) = 33.36$ p < 0.001
Final O ₂ Sat. (Intervention)	3.28	3.65	2.25	3.73	2.08	$\chi^2(4) = 43.22$ p < 0.001

Subtitle: χ^2 - Friedman's test statistics; p - value of test

Table 8 - Analysis of differences between time points, in the assessment of final oxygen saturation, for the control group and intervention group

When we analyzed the final oxygen saturation by groups in relation to the moments of evaluation that took place in the study (Table 8), we noticed there are statistically significant differences between the evaluations, both for control group and for intervention group [$\chi^2(4) =33.36$; p<0.001 and $\chi^2(4)=43.22$; p<0.001, respectively].

The data in table 9 show statistically significant differences at all time points, and saturation was always higher in final assessment when compared to initial assessment (all p<0.05).

		Pre-operative consultation		The day before surgery		1 st post-op.		Discharge	
		Inicial Sat.	Final Sat.	Inicial Sat.	Final Sat.	Inicial Sat.	Final Sat.	Inicial Sat.	Final Sat.
Intervention group	Median	97	100	98	100	95,5	97	97,5	100
	Interquartile range	2.00	2.00	2.25	2.00	2.00	2.50	1.25	0.25
	Average	96.97	99.37	97.70	99.53	95.57	98.80	97.27	99.60
	Standard deviation	1.33	0.76	1.42	0.68	1.19	0.96	1.23	0.77
Comparison		Z = -4.87 p<0.001		Z = -4.69 p<0.001		Z = -4.87 p<0.001		Z = -4.87 p<0.001	
Subtitles: Z - Wilcoxon test statistics; p - Proof value									

Table 9 - Analysis of differences between initial and final oxygen saturation assessment

DISCUSSION

As in the previous chapter, we chose to discuss the results according to the dependent variables under study.

Pain

The pain essentially happened on the first day of postoperative period with a median of 2, according to the pain scale (maximum 7 and minimum 0), in the control group; and a median of 1.5 (maximum 5 and minimum 0) in the intervention group. In the following evaluation moments (discharge and postoperative consultation) pain levels decrease compared to the 1st postoperative day in the intervention and control group.

When analyzing these values, it is clear that it is common in moments closer to surgery for pain levels to be higher. However, according to the medians, we can consider these pain levels reduced. This is because most clients have an epidural catheter, an infusion pump for continuous analgesia and the ability to infuse bolus autonomously when they are in pain. On the other hand, there are prescribed analgesia protocols to help manage pain.

Perhaps because of this pharmacological pain control, which aims at the absence of pain in the postoperative period, the statistical analysis at this time of evaluation (1st postoperative day) has not shown significant differences between the control and intervention groups. (p=0.411).

As previously described, the longitudinal analysis, between the 1st postoperative day, the time of discharge and postoperative consultation, allows us to verify that there is a decrease in pain in both groups with significant differences. This fact is understandable because as time passes, the pain becomes less. However, this decrease in pain intensity was greater for the intervention group, which leads us to conclude that the RFR program influenced pain.

Two studies corroborate our data in that they conclude that kinesitherapy promotes pain reduction after its completion ⁽²¹⁾. These studies challenge the principle that mobilization can increase pain levels in

the postoperative period of abdominal surgery. In fact, they say that not only analgesia, but also kinesitherapy, help to reduce pain levels, reduce hospital stay and improve clients' recovery ⁽²¹⁾.

Like our results, two other investigations conclude that there was an increase in pain levels in the immediate postoperative period and a decrease in the second postoperative day and following ^(22,23).

Our hypothesis is partially supported by the statistical analysis, that is, there are only statistically significant differences between the groups at discharge and at the postoperative visit, with pain levels being lower in the intervention group, in these two moments of assessment. With the longitudinal analysis, we realize that the long-term RFR program brings benefits with regard to pain levels, especially when pharmacological analgesia levels are lower. We can say that in addition to the statistical impact that these data translated, the clinical benefits caused by the RFR program on the pain levels of clients under study are also noticeable and valuable.

Respiratory Frequency

The values obtained by the statistical analysis regarding respiratory rate, show medians at all times and in both groups that vary between 16 and 18, meaning, values that are clinically considered normal and minimum values of 14 and maximum values of 24. The analysis does not show significant differences between groups (all p>0.05).

Regarding the longitudinal evaluation, the control group does not present significant differences. As for the intervention group, data tell us that there are significant differences, but they are not clinically valuable because the data obtained on respiratory rate were stable and normal throughout the study.

We can assume that the RFR program did not interfere with the respiratory rate of the study sample. Contrary to our results, an investigation carried out in the same context revealed that respiratory kinesitherapy resulted in an improvement in the respiratory rate, within a short period of time (30 minutes) after the therapy was carried out ⁽²⁴⁾. Another study concludes that the preoperative RFR

program implemented contributed to the stability of the respiratory rate ⁽²²⁾.

The data from our study lead us to say that our hypothesis was neither statistically nor clinically supported.

O₂ Saturation

Oxygen saturation values throughout the study were considered normal (minimum value was 92%) in the control and intervention group. However, when comparing the values of initial oxygen saturation between groups, it was found that clients in the intervention group had a higher initial O₂ saturation, at time of discharge and postoperative consultation, being the differences observed between both groups significant at these times ($p=0.018$ and $p<0.0001$, respectively). In the remaining evaluation moments, the differences between the groups were not statistically significant.

Longitudinally, it is clear that from the preoperative consultation and the day before surgery in relation to the 1st postoperative day there is a decrease in this value, which is understandable, since the client underwent gastrectomy, which proves that this surgical procedure interferes with this variable. This happens in the control and intervention group. However, if we compare the 1st postoperative day with the time of discharge and postoperative consultation, we notice that there is a significant increase in saturation, which is higher in the intervention group, demonstrating advantages for clients in this group.

This fact leads us to affirm that the RFR program interfered in a beneficial way for the clients in the intervention group, allowing them to have, at the time of discharge and postoperative consultation, oxygen saturation values higher than clients in the intervention and control group. Let's say that there is a substantial improvement in oxygen saturation as the RFR program is implemented.

Regarding the final oxygen saturation, there are statistically significant differences between the control and intervention groups in all evaluation moments, always with better values in the intervention group. This demonstrates that the RFR program positively interferes with this variable. The RFR program brings immediate benefits in the final O₂ saturation of clients in the intervention group.

Other investigations corroborate the obtained data, demonstrating that respiratory kinesitherapy was able to improve oxygen saturation after its completion, favoring clients with higher oxygen levels at the end of its performance ⁽²¹⁾.

At the longitudinal level, the final O₂ saturation behaved like the initial O₂ saturation.

Contrary to our study, Rodrigues (2015), in his study with the application of a preoperative RFR program in patients undergoing abdominal surgery, says that this program did not have any advantage in terms of oxygen saturation.

Our hypothesis is partially supported by statistical analysis:

- in the comparison of the initial O₂ saturation between the intervention and control groups, at the time of discharge and during the postoperative consultation;
- in the comparison of the final O₂ saturation between the intervention and control groups, at all evaluation moments;
- in the comparison of initial O₂ saturation - final O₂ between the intervention group, in all evaluation moments;
- longitudinally, there is an improvement in the initial and final O₂ saturation from the 1st postoperative day to the day of discharge and postoperative consultation, with a significant advantage for the intervention group.

CONCLUSIONS

From the literature review carried out, which followed the entire research process, it was quickly realized that the study of rehabilitation nursing in this area is scarce. Internationally, research is carried out on RFR in clients undergoing abdominal surgery, and the studies are mainly carried out by physiatrists or physiotherapists. It should be added that this study was totally innovative in focusing its action only on clients undergoing gastrectomy, which, according to the review carried out, had never been done before.

We summarize the main results of this investigation, concluding that the RFR program:

- had an impact on pain at discharge and postoperative consultation, with favorable values for the intervention group with lower pain levels;
- had no impact on respiratory rate, the results being constant and within normal values;
- had an impact on initial O₂ saturation at discharge and postoperative consultation and on final O₂ saturation at all times between the control and intervention groups. As for the initial and final O₂ saturation values in the intervention group, there was always an improvement in these values in the final saturation, demonstrating a great advantage of implementing the RFR program.

We conclude that there is an influence of the RFR program on pain and O₂ saturation. This effect is beneficial for the intervention group, being more frequent during the postoperative period, which demonstrates that its continued application brings benefits to clients. This fact reveals the continued importance of the RFR program for this type of customer.

For the enhancement of Rehabilitation Nursing and recognition of its contribution to improving the quality of care provided, it is necessary to develop more research studies in this area, in order to demonstrate, through health gains for the client and for the health

service, the impact of the rehabilitation nurse on care.

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ORIENTAÇÕES CONCRETAS DOS ENFERMEIROS ESPECIALISTAS EM ENFERMAGEM DE REABILITAÇÃO EM HOSPITAIS PORTUGUESES

ORIENTACIONES CONCEPTUALES DE LOS ENFERMEROS ESPECIALISTAS
EN ENFERMERÍA DE REHABILITACIÓN EN HOSPITALES PORTUGUESES

CONCEPTUAL GUIDELINES OF REHABILITATION NURSES IN PORTUGUESE HOSPITALS

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Maria Manuela Martins¹; Olga Ribeiro²; João Ventura Da Silva³

1 - Escola Superior de Enfermagem do Porto - CINTESIS; 2 - Escola Superior de Saúde de Santa Maria - CINTESIS; 3 - CH de S. João

RESUMO

Objetivo: Identificar as concepções de enfermagem, pessoa, saúde e ambiente mais consensuais entre os enfermeiros especialistas em enfermagem de reabilitação.

Método: Estudo quantitativo, descritivo-exploratório, realizado em 36 instituições hospitalares, com a participação de 306 enfermeiros especialistas. Como instrumento de colheita de dados utilizou-se um questionário de autopreenchimento.

Resultados: Apesar de existirem diferenças nas cinco regiões do país, as concepções de enfermagem, pessoa, saúde e ambiente que os enfermeiros especialistas em enfermagem de reabilitação qualificam como totalmente de acordo com a sua prática são as de Afaf Meleis, Dorothea Orem, Callista Roy e Madeleine Leininger.

Conclusão: A congruência observada nos resultados relativamente às diferentes concepções revela a consistência da orientação concetual dos participantes. Neste sentido, o desafio passa por consolidar a sustentação do exercício profissional dos enfermeiros especialistas em enfermagem de reabilitação nos referenciais teóricos, cujas concepções são consideradas como totalmente de acordo com a sua prática.

Descritores: Enfermagem; Reabilitação; Modelos de Enfermagem.

RESUMEN

Objetivo: Identificar las concepciones de enfermería, persona, salud y ambiente más consensuadas entre los enfermeros especialistas en enfermería de rehabilitación.

Método: Estudio cuantitativo, descriptivo-exploratorio que se realizó en 36 instituciones hospitalarias, con la participación de 306 enfermeros especialistas. Como instrumento de recogida de datos, se utilizó un cuestionario de auto relleno.

Resultados: Aunque existen diferencias en las cinco regiones del país, las concepciones de enfermería, persona, salud y ambiente que los enfermeros especialistas en enfermería de rehabilitación califican como totalmente de acuerdo con su práctica son las de Afaf Meleis, Dorothea Orem, Callista Roy y Madeleine Leininger.

Conclusión: La congruencia observada en los resultados con respecto a las diferentes concepciones revela la consistencia de la orientación conceptual de los participantes. En este sentido, el desafío pasa por consolidar la sustentación del ejercicio profesional de los enfermeros especialistas en enfermería de rehabilitación en los referenciales teóricos cuyas concepciones son consideradas como totalmente de acuerdo con su práctica.

Descritores: Enfermería; Rehabilitación; Modelos de Enfermería.

ABSTRACT

Objective: To identify the most consensual conceptions of nursing, individuals, health and environment among the nurses who are specialists in rehabilitation nursing.

Method: A quantitative, descriptive-exploratory study was carried out in 36 hospital institutions, and 306 specialist nurses were involved in this research. As a tool for data collection, it was performed a self-completion questionnaire.

Results: Although there are differences in the five regions of the country, the nursing, individuals, health and environment conceptions that nurses in rehabilitation nursing designate as fully in accordance with their practice are those of Afaf Meleis, Dorothea Orem, Callista Roy and Madeleine Leininger.

Conclusion: The congruence observed in the results regarding the different conceptions shows the consistency of the conceptual guidelines of the participants. In this sense, the challenge is consolidating the support of the professional practice of nurses who are specialists in rehabilitation nursing in the theoretical frameworks whose conceptions are considered fully in accordance with their practice.

Descriptors: Nursing; Rehabilitation; Nursing Models.

INTRODUCTION

Currently, there has been a consensus that Nursing cannot move towards meeting its social commitment if there is no clarity about its disciplinary bases. This is because, without clear disciplinary guidance and a basis to guide professional practice, it is easy to lose track. In this context, all nurses are invited to support their professional practice within the framework of the discipline, which even though existing in theory, remain apart from practice. Otherwise, nurses are at risk of reverting to excellent technical professionals ⁽¹⁾. Whenever possible, theory should have global relevance, covering both generic and specialized domains, thus helping nurses to assert themselves, apply and assess their unique role in healthcare. In fact, although it is not a solution for everything, theory has the potential to improve practice, as it responds to the challenges of a complex and constantly evolving clinical environment, being essential to support the clinical decision, whether in the generic or specialized context ⁽²⁾.

Rehabilitation nursing is an area of specialized nursing intervention that focuses on the maintenance and promotion of well-being and quality of life and the recovery of functionality, through the promotion of self-care, prevention of complications and maximization of capabilities⁽³⁾. Until now, the path in this area of specialization has placed specialist nurses in rehabilitation nursing in a privileged position to respond systematically and intentionally to the challenges and trends of rehabilitation⁽⁴⁾. However, similarly to what happens in the generic domain of nursing, to systematize care in the context of rehabilitation nursing, it is necessary that there is a line of thought that supports the practice. Among the lines of thought that can be used, the theoretical nursing frameworks are the most adequate⁽⁵⁻⁶⁾. However, it is important to bear in mind that in order to identify the theories that best support the practice of care, it is necessary to have congruence between the concepts established by the theoretical models (nursing, person, health and environment) and the nurses' work context⁽⁵⁾.

Thus, based on the assumption that the professional practice of rehabilitation nursing should be supported by theoretical frameworks, we were interested in noticing which frameworks will be more consensual among specialist nurses in rehabilitation nursing. In this sense, as part of a broader investigation carried out in the national context: *"Contexts of hospital practice and nursing conceptions: views on the reality of quality and the ideal of excellence in the professional practice of nurses"*, this study aimed to identify nursing conceptions, person, health and environment more consensual among specialist nurses in rehabilitation nursing in the hospital context.

METHOD

Inserted in a quantitative approach, the study carried out was descriptive, of an exploratory

nature. Although it was initially planned to be implemented in all hospital institutions, framed in the Corporate Public Entity (CPE) management model, which at the time of data collection were 38, due to the fact that two institutions did not accept to participate, the study was carried out in 36 CPE hospitals in mainland Portugal. Taking into account the ethical-legal principles, in order to obtain authorization to carry out the study, a letter was sent to all hospital institutions, addressed to the board of directors, informing the study and requesting participation. Although the process inherent to authorizations varied from institution to institution, the study was approved by the ethics committees and respective boards of directors of the 36 hospital institutions involved.

As it was impossible to study the entire population, a sample was created. The sampling technique used was non-probabilistic for convenience. The inclusion criteria were defined as "being a nurse specialist/specialized in rehabilitation nursing" and "performing their professional activity in the hospital institution for a period of time equal or greater than six months, in the departments of medicine and medical specialties, surgery and surgical specialties or intermediate and intensive care units". In this sense, all specialist/specialized nurses in rehabilitation nursing who worked in the departments where the study was authorized and who agreed to participate were included in the sample, which consisted of 306 specialist nurses. After being clarified about the objectives, as well as the procedures inherent to the investigation, through written information made available in the service or by physical presence of the investigator, the specialist nurses who agreed to participate in the study were asked to sign the informed consent, which was guaranteed confidentiality and anonymity in the use and disclosure of information obtained.

The questionnaire was used as a data collection instrument, consisting of two parts: Part I - Characterization of the respondent and Part II - Conceptions of nurses. The construct validity of the second part is based on the conceptions of nursing, person, health and environment of 13 nursing theorists: Florence Nightingale (FN), Virginia Henderson (VH), Dorothea Orem (DO), Hildegard Peplau (HP), Imogene King (IK), Callista Roy (CR), Betty Neuman (BN), Moyra Allen (MA), Martha Rogers (MR), Rosemarie Parse (RP), Madaleine Leininger (ML), Jean Watson (JW) and Afaf Meleis (AM). When completing the questionnaire, specialist/specialized nurses were asked to express their opinion on the statements of each nursing theorist, regarding the four metaparadigm concepts: nursing, person, health and environment. The Likert-type response scale ranged from 1 to 5, with 1 corresponding to "It is totally in disagreement with my practice", 2 "it is in disagreement with my practice", 3 "I have no opinion", 4 "it is according to my practice" and 5 "it is totally in accordance with my practice". Data collection was carried out between the months of July 2015 to March 2016. For data treatment, we

used the statistical program, Statistical Package for Social Sciences, version 22.0.

RESULTS

As for the sociodemographic and professional profile of the participants, we found that of the 306 specialist/specialized nurses in rehabilitation nursing, most are female (71.2%), with a mean age of 38.4 years and a standard deviation of 7.6, with a predominance of marital status of married/cohabiting (60.5%). As far as the academic degree is concerned, bachelor's degree is the majority (74.84%), followed by master's (24.84%) and doctorate (0.32%). Regarding the distribution of specialist/specialized nurses according to the regions of the regional health administration to which the respective hospital institutions belong, 49.3% are from the North, 21.6% from Lisboa e Vale do Tejo, 20.6% from Centre, 5.2% from Algarve and 3.3% from Alentejo. With regard to the context in which they exercise functions, the departments of medicine and medical specialties have predominated (47.1%), followed by surgery and surgical specialties (38.2%) and intermediate and intensive care units (14.7%). Regarding professional practice in the specialty area, the average time was 3.7 years, with a standard deviation of 4.7, with a minimum of 0 years and a maximum of 23 years. The minimum value of 0 years is due to the fact that 132 nurses (43.1%) with specialization courses in rehabilitation nursing do not exercise their professional activity in the specialty area. The average time of professional practice in the current service was 8.8 years, with a standard deviation of 7.0, with a minimum of 1 year and a maximum of 32 years.

Once the main characteristics of the study participants are highlighted, in view of the previously formulated objective, we will then focus on the most significant results regarding the agreement expressed by specialist/specialized nurses on the conceptions of nursing, person, health and environment. Thus, in the national context, with regard to the concept of nursing, the conceptions that according to specialist/specialized nurses in rehabilitation nursing are fully in accordance with their practice are those of Afaf Meleis (36.3%), Dorothea Orem (35.6%), Callista Roy (33.0%), Madeleine Leininger (29.4%), Virginia Henderson (24.8%), Florence Nightingale (15.4%), Jean Watson (12.1%), Imogene King (8.2%), Betty Neuman (7.2%), Martha Rogers (6.9%), Hildegard Peplau (6.5%), Rosemarie Parse (6.5%) and Moyra Allen (6.2%) (Graph 1).



Graphic 1 - Percentage distribution of specialist nurses in rehabilitation nursing by nursing conceptions that are fully in line with their practice.

Regarding the concept of person, in the national context, the conceptions that according to specialist/specialized nurses in rehabilitation nursing are fully in line with their practice are those of Afaf Meleis (44.1%), Dorothea Orem (35.0%), Callista Roy (30.4%), Madeleine Leininger (27.5%), Virginia Henderson (24.5%), Florence Nightingale (14.4%), Jean Watson (9.8%), Moyra Allen (8.8%), Imogene King (8.2%), Martha Rogers (8.5%), Rosemarie Parse (7.8%), Betty Neuman (7.2%) and Hildegard Peplau (7.2%) (Graph 2).



Graphic 2 - Percentage distribution of specialist nurses in rehabilitation nursing by the conceptions of people who are fully in accordance with their practice.

With regard to the concept of health, in the national context, the conceptions that according to specialist/specialized nurses in rehabilitation nursing are fully in line with their practice are those of Afaf Meleis (43.1%), Dorothea Orem (38.2%), Callista Roy (31.0%), Madeleine Leininger (27.8%), Virginia Henderson (24.5%), Jean Watson (15.4%), Florence Nightingale (13.1%), Martha Rogers (8.2%), Hildegard Peplau (7.8%), Imogene King (6.9%), Moyra Allen (7.2%), Rosemarie Parse (6.9%) and Betty Neuman (6.5%) (Graph 3).



Graphic 3 - Percentage distribution of specialist nurses in rehabilitation nursing by health concepts that are fully in line with their practice

With regard to the concept of environment, in the national context, the concepts that according to specialist/specialized nurses in rehabilitation nursing are fully in line with their practice are those of Afaf Meleis (41.8%), Dorothea Orem (35.6%), Callista Roy (31.4%), Madeleine Leininger (28.4%), Virginia Henderson (25.8%), Jean Watson (15.4%), Florence Nightingale (13.4%), Rosemarie Parse (8.5%), Martha Rogers (8.8%), Betty Neuman (7.8%), Imogene King (8.2%), Hildegard Peplau (7.5%) and Moyra Allen (6.2%) (Graph 4).



Graphic 4 - Percentage distribution of specialist nurses in rehabilitation nursing by environmental concepts that are fully in line with their practice

After analyzing the agreement of specialist/specialized nurses in rehabilitation nursing regarding the conceptions of nursing, person, health and environment, in a national context, we carried out a regional analysis. To this end, the hospital institutions were distributed by the regions of the respective Regional Health Administrations, subsequently carrying out a regional comparison of the distribution of responses. For the purpose of presenting the results, as before, the conceptions that specialist/specialized nurses in rehabilitation nursing most identify with continue to be highlighted.

Figure 1 reflects the nursing conceptions that specialist/specialized nurses qualified as fully in accordance with their practice. Analyzing the results obtained, it is interesting to verify that, despite the agreement with Dorothea Orem's conception of nursing being transversal to all regions of the country, in the North, Center and Alentejo the conceptions of Afaf Meleis and Callista Roy emerge as relevant, in Lisboa e Vale do Tejo, the designs of Madeleine Leininger and Afaf Meleis and in Algarve the other designs that stood out were Madeleine Leininger and Callista Roy.

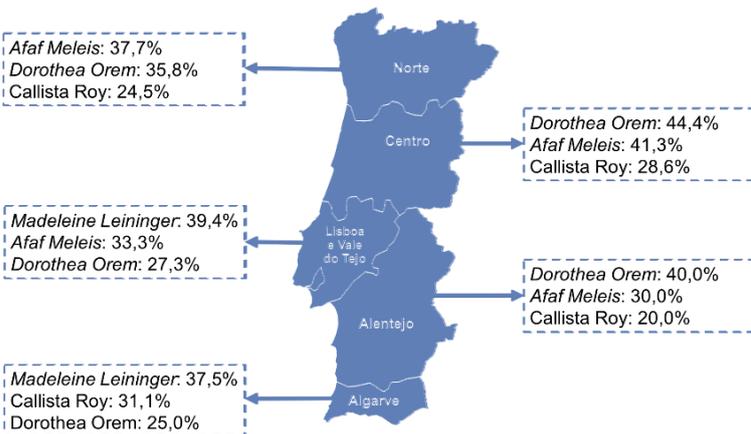


Figure 1 - Percentage distribution, by regions, regarding agreement with nursing conceptions

Still resulting from an analysis by regions, Figure 2 reflects the conceptions of person that specialist/specialized nurses qualified as totally in accordance with their practice. In an analysis of the results obtained, it was found that despite the agreement with Dorothea Orem's conception of person being transversal to all regions of the country, in the North, Center and Alentejo the conceptions of Afaf Meleis and Callista Roy continued to emerge with relevance, in

Lisboa e Vale do Tejo the designs of Afaf Meleis and Madeleine Leininger and in the Algarve the other designs that stood out were those of Madeleine Leininger and Roy.

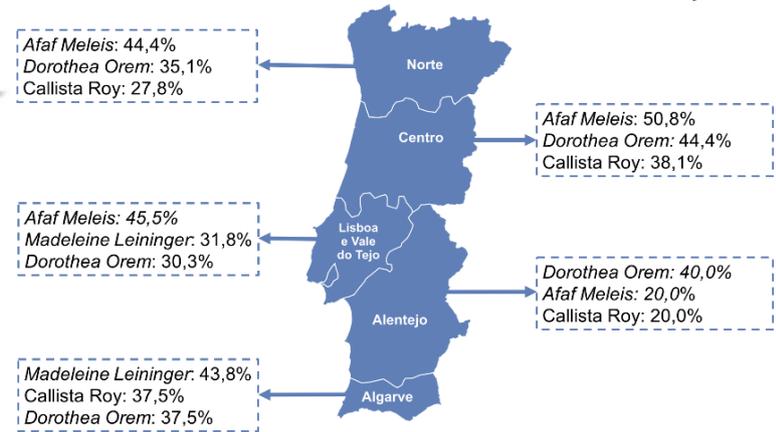


Figure 2 - Percentage distribution, by regions, regarding the agreement with the conceptions of person

Keeping the focus on an analysis by regions, Figure 3 reflects the conceptions of health that specialist/specialized nurses qualified as fully in line with their practice. Analyzing the results obtained, it is interesting to verify that, despite the agreement with the health concepts of Afaf Meleis and Dorothea Orem being transversal to all regions of the country, in the North, Centre, Alentejo and Algarve, the conception of Callista Roy emerged with relevance, and in Lisboa e Vale do Tejo, the other conception that stood out was that of Madeleine Leininger.

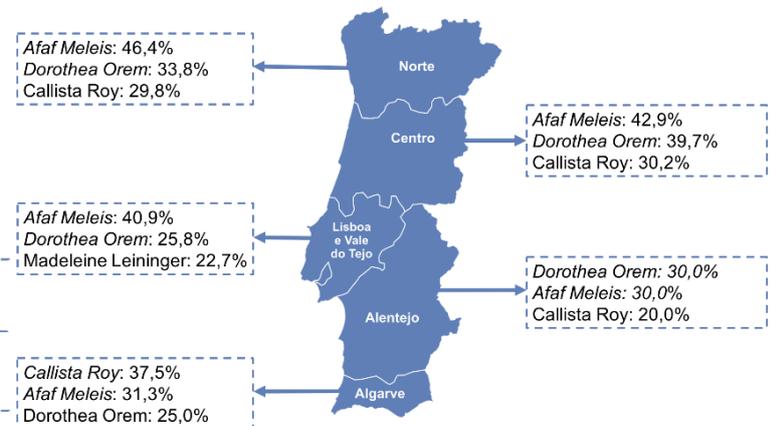


Figure 3 - Percentage distribution, by regions, regarding the agreement with health concepts

Still within the scope of an analysis by regions, Figure 4 reflects the conceptions of environment that specialist/specialized nurses qualified as fully in accordance with their practice. As a result of the analysis of the results obtained, it was found that despite the agreement with the concepts of environment by Afaf Meleis and Dorothea Orem being transversal to all regions of the country, in the North, Centre, Alentejo and Algarve, the concept of Callista Roy emerged with relevance, and in Lisboa e Vale do Tejo the other conception that stood out was of

Madeleine

Leininger.

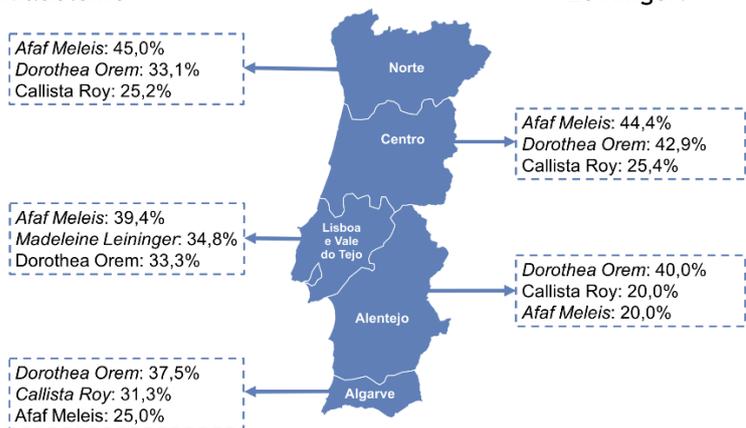


Figure 4 - Percentage distribution, by regions, regarding the agreement with the environmental concepts

Considering the results stated in relation to the four metaparadigm concepts, nursing, person, health and environment, we found that in the North, Center and Alentejo there is a unanimous agreement with the conceptions of Afaf Meleis, Dorothea Orem and Callista Roy. In Lisboa e Vale do Tejo, the agreement regarding the four concepts is verified in relation to the conceptions of Afaf Meleis, Dorothea Orem and Madeleine Leininger. In Algarve, the agreement is verified in relation to the conceptions of Dorothea Orem and Callista Roy (Figure 5).



Figure 5 - Unanimity in agreement with the conceptions of nursing, person, health and environment

DISCUSSION

Following the analysis of sociodemographic and professional variables, we found that most specialist/specialized nurses who participated in the study were female (71.2%), had an average age of 38.4 years and, predominantly with degree(74.84%). In addition to these results reflecting the sociodemographic reality of nursing professionals in Portugal, they corroborate the data updated by the Ordem dos Enfermeiros⁽⁷⁾ regarding the area of specialization in rehabilitation nursing. As for the length of professional practice in the specialty area, although it varied between a minimum of 0 years and a maximum of 23 years-old, the average time was 3.7 years. The fact that 43.1% of the nurses who

participated in this study do not exercise their professional activity in the specialty area is highlighted, which, once again, reveals the lack of use of the nurses' qualifications⁽⁸⁾. According to data published by the Order of Nurses, in December 2016, 46.8% of Portuguese nurses with a specialization in rehabilitation nursing practice their professional activity within the scope of general care⁽⁷⁾, which is in line with the results obtained in this study carried out in the national context.

Although in the documents that support the professional practice of rehabilitation nursing it is clear that in the guidance of the practice of rehabilitation nursing care, the models of self-care and transitions are structuring for the optimization of quality⁽³⁾, this study allowed us to confirm that these models are currently an integral part of the conceptual orientation of specialist nurses in rehabilitation nursing. Effectively, the results obtained in this study make it clear that the conceptions of nursing, person, health and environment that specialist/specialized nurses in rehabilitation nursing qualify as totally in accordance with their practice are those of Afaf Meleis, Dorothea Orem, Callista Roy and Madeleine Leininger.

Although no studies were found that provided numerical data on the nursing models and theories most used by specialist nurses in rehabilitation nursing, the congruence observed in the results makes it clear that these specialist nurses focus on their role in facilitating processes and transitional human experiences; in promoting self-care; in people's adaptive capacities, emphasizing the promotion of health, stability and quality of life, as well as in the activities of assisting, supporting and empowering people to maintain or regain well-being in culturally significant ways.

Similar to the results obtained in a study carried out in the national context with general care nurses, specialist nurses and nurse managers⁽⁸⁻⁹⁾, it is interesting to verify the option for the concepts that best suit the practice is mostly the same, when a nurse specialist in rehabilitation nursing identifies himself with a theoretical nursing framework, he almost always identifies himself in relation to the four metaparadigm concepts: nursing, person, health and environment. In this previous study, the conceptions that obtained greater agreement were those of Virginia Henderson, Afaf Meleis, Dorothea Orem, Madeleine Leininger and Callista Roy. Due to these results, it was realized that, in the context of general care, it is based on Virginia Henderson's theoretical framework that nurses identify the needs and problems of clients and, in relation to whom they plan and carry out the interventions intentionally directed towards the replacement of the person in what he cannot do⁽⁸⁻⁹⁾.

Considering that in the current study, the conceptions that obtained the greatest agreement were those of Afaf Meleis, Dorothea Orem, Callista Roy and Madeleine Leininger, it appears that, given the evolution of the nursing discipline and

specialization in rehabilitation nursing, nurses specialists have been committed to changes that they believe will culminate in a systematized practice, and which, therefore, must be based on the scientific and philosophical assumptions that each of the adopted theories expose⁽¹⁰⁾. The changes we refer to are mainly related to the “detachment” from Virginia Henderson’s theoretical framework and, consequently, to the appropriation of the frameworks of Afaf Meleis, Dorothea Orem and Callista Roy. In addition, compared to the results of the aforementioned study⁽⁸⁻⁹⁾, it is important to highlight that there is less dispersion regarding the agreement of specialist nurses with the different conceptions. In fact, the percentage of specialist/specialized nurses who also consider the conceptions of Florence Nightingale, Virginia Henderson, Hildegard Peplau, Imogene King, Betty Neuman, Moyra Allen, Martha Rogers, Rosemarie Parse and Jean Watson as totally in accordance to their practice.

Although, empirically, at the present time, we are aware that the attempt to sustain professional practice in theoretical frameworks is linked to some contexts, as a result of the initiatives of some specialist nurses in rehabilitation nursing, it is important to highlight it, since constitutes an opportunity for the consolidation of a new paradigm.

This study reinforced the idea that theories that have been shaping the professional practice of specialist nurses in rehabilitation nursing are those of Afaf Meleis, Dorothea Orem, Callista Roy and Madeleine Leininger, and it is based on these theoretical references that nurses will validate on a regular base the real and potential needs and problems of clients and for whom they design and implement rehabilitation nursing care plans, with a view to improving residual functions, maintaining or regaining independence, as well as minimizing the impact of installed disabilities, namely at the level of neurological, respiratory, cardiac and/or orthopedic functions⁽¹¹⁾.

As for the results obtained in relation to theoretical references that are fully in line with practice, there are several possible justifications. On one hand, the training investment made in recent years regarding the relevance of the theoretical frameworks of Afaf Meleis, Dorothea Orem, Callista Roy and Madeleine Leininger, within the professional practice of nurses specializing in rehabilitation nursing, which may even justify the differences between regions. On the other hand, the confirmation by the investigations carried out, in the national and international context, that the conceptions of Afaf Meleis, Dorothea Orem, Callista Roy and Madeleine Leininger are widely applicable, being an essential contribution to the foundation and guidance of the practice of rehabilitation nursing^(4,12-14). In fact, the use of theories to guide practice will contribute to a more efficient and effective performance, where the collection and organization of data, the formulation of diagnoses, the planning and implementation of

interventions, as well as the definition of results, will be based on the same connecting thread^(6,9).

CONCLUSION

The conviction that the professional practice of specialist nurses in rehabilitation nursing should be supported by theoretical frameworks and the lack of studies centered on identifying the conceptual guidelines of these nurses constituted the main motivations for carrying out this study.

In line with the results obtained, we found that the option for the conceptions that best suit the practice is mostly the same, when a specialist nurse identifies with a theoretical framework, he/she is almost always identified in relation to the four concepts metaparadigms: nursing, person, health and environment. In this sense, we found that specialist nurses in rehabilitation nursing qualified as fully in accordance with their practice the concepts of Afaf Meleis, Dorothea Orem, Callista Roy and Madeleine Leininger.

Given the relevance of these theoretical frameworks for sustaining the professional practice of specialist nurses in rehabilitation nursing, its incorporation in the contexts of practice is a challenge, because, despite the theoretically significant evolution, only the consolidation of the theoretical foundations will allow a systematic and intentional practice.

Despite the contributions of this study, we assume as a limitation the fact that the sampling technique was non-probabilistic, with the possibility that the profile of specialist nurses who participated could have influenced the results.

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REEDUCAÇÃO FUNCIONAL DA PESSOA COM DEGLUTIÇÃO COMPROMETIDA: ESTUDO DE CASO

REEDUCACIÓN FUNCIONAL DE LA PERSONA CON DEGLUCIÓN COMPROMETIDA: ESTUDIO DE CASO

FUNCTIONAL REEDUCATION OF PERSON WITH COMMITTED DEGLUTITION: CASE STUDY

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Paulo César Lopes Silva¹; Eugénia Nunes Grilo²

1 - Unidade Local de Saúde do Baixo Alentejo, EPE;

2 - Escola Superior de Saúde Dr. Lopes Dias, Instituto Politécnico de Castelo Branco

RESUMO**Objetivos:** Identificar os ganhos sensíveis aos cuidados de enfermagem de reabilitação com um programa de otimização da deglutição numa pessoa com deglutição comprometida.**Método:** Estudo de abordagem qualitativa, tipo estudo de caso. Centra-se na aplicação do Processo de Enfermagem, respeitando a linguagem CIPE®, e recorre ao Padrão Documental dos Cuidados da Especialidade de Enfermagem de Reabilitação para a fundamentação das intervenções implementadas. Expõe-se o caso de uma pessoa com deglutição comprometida, de etiologia neurológica, admitida numa Unidade de Internamento de um Centro Hospitalar, sendo assegurados os princípios éticos na sua abordagem.**Resultados:** Não foram evidenciadas complicações na implementação do programa e observou-se a recuperação completa da função deglutição, após dez sessões de treino.**Conclusões:** A sistematização dos cuidados de enfermagem de reabilitação revelou-se eficaz para reverter a alteração observada e concorreu para incrementar a autonomia da pessoa.**Descritores:** Transtornos de Deglutição, Relatos de Casos, Enfermagem em Reabilitação; Autocuidado.**RESUMEN****Objetivos:** Identificar las ganancias sensibles a los cuidados de enfermería de rehabilitación con un programa de optimización de la deglución en una persona con deglución comprometida.**Metodología:** Estudio de enfoque cualitativo, tipo estudio de caso. Se centra en la aplicación del Proceso de Enfermería, respetando el lenguaje CIPE®, y recurre al “Patrón Documental de los Cuidados Especializados de la Especialidad de Enfermería de Rehabilitación” para la fundamentación de las intervenciones implementadas. Se expone el caso de una persona con deglución comprometida, de etiología neurológica, admitida en una Unidad de un Centro Hospitalario, siendo asegurados los principios éticos en su abordaje.**Resultados:** No se evidenciaron complicaciones en la implementación del programa y se observó la recuperación completa de la función deglución, después de diez sesiones de entrenamiento.**Conclusiones:** La sistematización de los cuidados de enfermería de rehabilitación resultó eficaz para revertir la alteración observada y permitió incrementar la autonomía de la persona.**Descriptorios:** Trastornos de Deglución, Informes de Casos, Enfermería en Rehabilitación, Autocuidado.**ABSTRACT****Objectives:** To identify the sensible gains for rehabilitation nursing care with a swallow optimization program in a person with compromised swallowing.**Methods:** Qualitative study, type of case study. It focuses on the application of the Nursing Process, respecting the CIPE® language, and uses the Documentary Pattern of Care of the Rehabilitation Nursing Specialty for the substantiation of the implemented interventions. We present the case of a person with compromised swallowing, of neurological etiology, admitted to a Hospital Center inpatient unit, assuring the ethical principles in their approach.**Results:** There was no evidence of complications in the implementation of the program and complete recovery of the swallowing function was observed after ten training sessions.**Conclusion:** The systematization of rehabilitation nursing care proved to be effective in reversing the observed change and contributed to increase the person's autonomy**Descriptors:** Deglutition disorders, Case Reports, Rehabilitation nursing, Self Care.

INTRODUCTION

When approaching people with impaired swallowing, it is important that the multidisciplinary team is aware of its consequences and knows how to identify its clinical signs⁽¹⁾. Thus, an early assessment of the swallowing function is as or greater importance as the assessment of the person's state of consciousness and the nursing team must be prepared to quickly identify these persons, facilitating the diagnosis and treatment of the alteration in question⁽²⁾.

The intervention of the nurse, namely the rehabilitation nurse, is essential for persons with impaired swallowing, accompanying them in the rehabilitation process since its beginning and constantly.

The person's perception is equally fundamental in the nursing diagnosis "compromised swallowing". In this sense, the Eat Assessment Tool (EAT-10) is an instrument that can be applied to persons with impaired swallowing, regardless of their diagnosis, as it allows measuring the degree of swallowing change felt by them⁽³⁾.

It is a Likert-type questionnaire where the person reports the intensity of the perceived change, assigning a score to each of the ten statements, from which a score can be obtained that can vary between 0 for no problem and 4 that corresponds to big problem. A final score greater or equal to three points indicates the presence or risk of impaired swallowing⁽³⁾.

A study indicates that 48% of people with aspirations detected by videofluoroscopy did not present cough after aspiration of swallowed content, attesting to a high incidence of silent aspirations⁽⁴⁾. Considering this problem, the Volume-Viscosity Swallow Test (V-VST) is an easy-to-apply clinical exploration method that uses pulse oximetry as a complementary procedure for the rapid identification of these persons without recourse to invasive methods such as videofluoroscopy or videoendoscopy⁽⁴⁾.

This method allows the rapid detection of clinical signs of change in the efficiency and safety of swallowing through the administration of three types of consistencies: nectar, liquid and pudding, respecting a flowchart with different degrees of difficulty⁽⁴⁾. Changes in efficacy include: ineffective lip closure, presence of oral or pharyngeal residues, and multiple swallows per bolus administered. Signs of change in safety include: change in voice quality, cough or decrease in pulse oximetry greater or equal to 3%⁽⁴⁾.

With the data obtained in the application of the V-VST method, it is possible to categorize the functional limitations in oral feeding⁽⁴⁾. In this sense, the Functional Oral Intake Scale (FOIS), with its 7 items, is an assessment instrument that allows this approach. A person positioned at level 7 does not present any type of limitation, on the other hand, a person positioned at level 1 is not able to swallow any food orally⁽⁵⁾.

In turn, in levels from 1 to 3 of this instrument, are those who need a nasogastric tube to maintain an adequate food or water intake. Levels 4 to 7 are intended for those who are capable of oral ingestion without the need for any alternative route⁽⁵⁾.

The EAT-10 and the FOIS are two easy-to-apply instruments⁽⁵⁾, they are validated for the Portuguese population^(3;5) and are a valuable asset for the assessment of those with impaired swallowing, guiding their respective rehabilitation⁽⁵⁾.

with regards to treatment of swallowing disorders, it is important to accurately identify the affected structures and the type of deficit in swallowing. If muscle weakness is identified, the person should be guided to perform a series of exercises focused on re-educating specific areas of the base of the tongue or the lateral walls of the pharynx. In the case of the presence of neurological deficit that leads to changes in the swallowing reflex or if the muscle deficit is insurpassed, then the person should be guided to implement compensatory strategies to improve swallowing safety⁽⁶⁾.

After identifying the change in swallowing, it is essential to outline the planning of nursing care, aiming at the functional re-education of swallowing which, given its complexity, requires specific skills in the field of intervention⁽⁷⁾.

The rehabilitation process of compromised swallowing encompasses skills training and muscle strength components, which aim to ensure safe oral intake and combat swallowing alterations⁽⁸⁾.

In parallel, it is also essential to implement other rehabilitation nursing care, such as techniques to improve the ventilatory pattern and ventilatory mechanics, seeking to ensure the permeability of the airways, promote strengthening of the respiratory muscles and reduce the risk of aspiration⁽⁷⁾.

The prevention of the consequences of immobility should include nursing interventions focused on promoting self-care using adaptive strategies⁽⁹⁾. It is common to observe changes in mobility in people with impaired swallowing, such change cannot be neglected in the planning and implementation of a rehabilitation nursing program. Thus, nursing interventions, in this context, should promote self-control and self-care for these persons.

Introducing rehabilitation as a process that aims at the person's functional recovery, reintegration into the family, community and society, a holistic approach to the person being cared for is necessary⁽¹⁰⁾. When approaching the person with compromised swallowing, these premises must always be constant.

Rehabilitation Nursing can play a key role in approaching the person with this disorder. This specialty, with another area of Nursing, must be supported by a framework that guides the practice. In the present approach, Dorothea Orem's Self-Care Deficit Nursing theory fits perfectly.

The aforementioned nursing theory proposes five areas of activities for practice, which are: the maintenance of a therapeutic relationship; determining how the person can be helped through nursing care; the response to the person's needs in relation to the nurse's contact and assistance; the prescription, provision and regulation of direct help to the person and significant companions; the coordination and integration of nursing care in the person's daily life; other health care or the necessary social and education services⁽¹¹⁾. The five areas mentioned are well present throughout the case presented.

The present study focused on the implementation of a functional re-education program, consisting of rehabilitation nursing interventions with a person with compromised swallowing of neurological etiology. Thus, strategies were developed duly based on the Nursing Process and on the Documentary Standard of Specialized Care of the Rehabilitation Nursing Specialty⁽¹²⁾. Likewise, the use of appropriate assessment instruments allowed the elaboration of diagnostic criteria that helped to define more accurate rehabilitation nursing diagnoses in this context and sought to guide the process of evaluating the results of that same program.

In this sense, the general objective of this study was to identify the gains sensitive to rehabilitation nursing care with the implementation of a swallowing optimization program in a person with impaired swallowing. The specific objectives aimed to identify swallowing changes using three instruments: assessment of swallowing changes; define the main rehabilitation nursing diagnoses in the context of compromised swallowing; evaluate the impact of implementing a swallowing optimization program in a person with impaired swallowing, in improving rehabilitation nursing diagnoses.

MATERIAL AND METHODS

In Nursing, the approach through the case study allows the researcher to study a complex phenomenon of life in an intensive and profound way, using multiple sources of evidence⁽¹³⁾.

Case studies can generate hypotheses for future clinical studies, as well as guidance for the individualization and personalization of care provision. The CARE (Case REport) guidelines were used as they provide the necessary structure to satisfy the accuracy, integrity and transparency in the scientific approach to case studies⁽¹⁴⁾.

CARE's guidelines are part of a 13-item checklist (title, keywords, abstract, introduction, person information, clinical findings, schedule, diagnostic evaluation, therapeutic intervention, clinical follow-up and results, discussion, person perspective, term of informed consent) and is specially structured to correspond to the main components of a case study and to apprehend the relevant clinical information⁽¹⁴⁾.

Likewise, in the structuring of this study, the six stages of the development of the case study defined

by Yin and Stake were fulfilled, namely: Definition of the problem; Case definition; Theoretical foundation; Preparation of the study protocol; Data collection; Analysis and interpretation of results⁽¹³⁾.

This study describes the case of a person with compromised swallowing and presents a longitudinal character, which allows to demonstrate the functional swallowing reeducation program developed with this person and showing the results achieved.

It was carried out during the month of November 2017, from admission to a unit in the department of medicine of a Hospital Center of the Regional Health Administration of Lisboa e Vale do Tejo, until the functional swallowing was recovery. It is a unique case and a holistic approach.

The person involved in the study signed the free and informed consent form for health acts/interventions under the terms of standard No. 015/2013 of the Directorate-General for Health.

The study was approved by the Ethics Committee for Health and authorized by the Board of Directors of the Hospital Center.

It is noteworthy that all ethical aspects connected with research carried out with human beings were respected. Thus, was sought to comply with the indications expressed in the Declaration of Helsinki, in the Convention on Human Rights and Biomedicine, in the guidelines of the Council for International Organizations of Medical Sciences and in the Guide to Good Clinical Practices.

The person was designated by a letter (A), safeguarding data confidentiality and anonymity.

The use of specific instruments for the assessment of swallowing commitment required the request for authorization from national researchers who had adapted these same instruments to European Portuguese.

This study shows the results of a participant who was part of a large project whose inclusion criteria for the participants were: a Glasgow Comas Scale score greater or equal to 11 points (maximum score on the items "eye opening" and "best motor response"), in order to include people with speech deficits; EAT-10 score greater or equal to 3 points (suggesting the perception of commitment in swallowing⁽³⁾); FOIS higher than level 1 and lower than level 7 (allowing the inclusion of persons with oral intake, but with commitment in the ingestion of certain consistencies⁽⁵⁾).

A statistical analysis of all EAT-10 questionnaires applied to the person throughout the study was performed, using the IBM-SPSS (Statistical Package for the Social Sciences) version 22.0 software, facilitating a subsequent descriptive analysis.

CASE PRESENTATION

Anamnesis

The anamnesis guides the health professional towards the diagnosis and respective therapeutic plan. Socioeconomic characteristics, past history, family history and current clinical history are fundamental components for a good anamnesis⁽¹⁵⁾.

The case of Mr. A, 57 years-old, male, Caucasian and of Portuguese nationality, is exposed. Has the 9th grade of schooling. Mr. A is married and has no children. As for his employment situation, works in a company as an elevator technician. Was admitted to the Hospital Center emergency department on November 5, 2017 with a hypertensive crisis accompanied by headache, vomiting, prostration and decreased muscle strength in the body segments of the left hemibody, being referred through the green stroke pathway. Afterwards, was referred to the Stroke Unit of the Hospital Center, after performing a Cranio-Brain Computed Axial Tomography, compatible with an acute vertebrobasilar ischemic injury.

Mr. A had hypertension and dyslipidemia as personal history, presenting as usual therapy: captopril 12.5mg/day; bisoprolol 2.5mg/day; pravastatin 20 mg/day. This is his first hospitalization and he is not aware of any type of allergies.

As for the nutritional status, Mr. A had an adequate weight for his height (weight 82 kg and height 180 cm), corresponding to a body mass index of 25.31 kg/m², a value that was maintained throughout the functional re-education of swallowing. However, Mr. A had 3 to 4 meals a day throughout the hospital stay, showing changes in the safety and effectiveness of swallowing food with liquid consistency from the day of admission, with an evident risk of dehydration.

Since the day of admission, Mr. A had a change in communication, namely in speech fluency (dysarthria). He had no changes in hearing or vision, and did not need any compensation mechanism. The allopsychic and autopsychic orientation were always a constant in Mr. A. He showed perfect awareness of his clinical situation and was always participative in the instituted program.

In the context of activities of daily living and instrumental activities of daily living, Mr. A was independent until hospitalization and reported having an active social life.

As for the socio-family and housing situation, Mr. A mentioned that had no economic difficulties. He lived with his wife in a one-story house in the center of a village. The presence of the wife was a constant from the tenth day of hospitalization, followed since then, her clinical evolution and actively participated in the instituted program.

Rehabilitation Nursing Assessment

The data obtained through the anamnesis complement those achieved in the physical examination of the person and guide the rehabilitation nurse in the

implementation of a program based on diagnoses and rehabilitation nursing interventions.

The rehabilitation program and first contact with Mr. A started 24 hours after his admission to the service, on November 6, 2017, and the rehabilitation nursing interventions were implemented until November 24, 2017. Mr. A was discharged on November 28, 2017.

In Mr. A's physical examination, the use of the aforementioned assessment instruments was essential for an adequate categorization of the degree of swallowing alteration. The use of these assessment instruments allowed the definition of rehabilitation nursing diagnoses and the determination of sensitive gains for rehabilitation nursing care.

According to the bibliographic sources consulted, an interval of 48 hours is advocated for the evaluation with the EAT-10⁽³⁾. As for FOIS, its application is suggested within 24 hours after admission and 3 hours after an initial evaluation⁽⁵⁾. Thus, Mr. A was subjected to an assessment at the beginning of the swallowing functional reeducation program and the periodicity of assessments was maintained in an interval of three sessions, in order to maintain the recommended time for the application of the FOIS scale.

When the alteration in Mr. A's swallowing was identified with the EAT-10 score and the FOIS level obtained in the subjective evaluation, an objective evaluation was carried out using the clinical exploration method V-VST.

This objective evaluation allowed the determination of food consistency and volume for safe swallowing, confirming or corroborating the level of FOIS obtained in the subjective evaluation, and substantiating the recommended diet and necessary supervision. Signs of change in swallowing safety and effectiveness, detected during the V-VST, were recorded in a recording instrument developed for this purpose.

In each of the assessments carried out, in addition to applying the aforementioned assessment instruments, the nursing diagnoses and respective interventions under the "swallowing" focus were adjusted.

Aiming at a holistic approach, during the swallowing functional reeducation program, it was possible to collect other data that allowed interpreting the person's ventilatory condition and nutritional status. Regarding the ventilatory condition, oxygen saturation, obtained through peripheral oximetry, was monitored and recorded daily. As part of the assessment of nutritional status, the person's Body Mass Index (BMI) was monitored every six sessions.

Rehabilitation Nursing Diagnoses

The three nursing diagnoses that supported the swallowing functional reeducation program were defined respecting the language of the International Classification for Nursing Practice (ICNP®) version 2015⁽¹⁶⁾ and focused on the focus "Swallowing" and on the dimensions of "Knowledge" and "Learning Skills"⁽¹²⁾. Are they:

1. Compromised swallowing;
2. Potential to improve knowledge about exercises and swallowing techniques;
3. Potential to improve ability to perform swallowing exercises and techniques.

Swallowing Functional Reeducation Program

Throughout the functional swallowing reeducation program, by gathering the data collected in the subjective and objective assessment of Mr. A, and after surveying the nursing diagnoses, several nursing interventions were proposed (Table 1).

Swallowing Focus		
Active diagnosis	Diagnostic Statements	Statements of diagnosis action and nursing interventions
Session 1 to 3	Moderately compromised swallowing	To evaluate swallowing ability
		To monitor swallowing (EAT-10, V-VST, FOIS)
		To supervise swallowing
		To encourage swallowing
		To manage diet
		To plan diet
		To position the Person
Session 4 to 10	Reduced compromised swallowing	To evaluate swallowing ability
		To monitor swallowing (EAT-10, V-VST, FOIS)
		To supervise swallowing
		To manage diet
		To plan diet
		To position person
Knowledge Dimension		
Active diagnosis	Diagnostic Statements	Statements of diagnosis action and nursing interventions
Session 1 to 10	Potential to improve knowledge about swallowing exercises and techniques	To teach about pathological process
		To teach about complications of the pathological process
		To teach about diet (adapted diet)
		To teach about swallowing exercises and techniques
		To assess knowledge about swallowing exercises and techniques
Dimension of Learning Skills		
Active diagnosis	Diagnostic Statements	Statements of diagnosis action and nursing interventions
Session 1 to 10	Potential to improve ability to perform exercises and swallowing techniques	To instruct/train exercises and swallowing techniques
		To assess ability to perform swallowing exercises and techniques

Table 1: Swallowing Functional Rehabilitation Program (12,16)

In the application of the clinical exploration method V-VST, clinical manifestations were observed in the different phases of swallowing, as reported in the consulted bibliography^(17, 18).

This fact enabled the identification of the swallowing phase with the greatest number of alterations and guided towards the selection of the most adequate set of exercises and techniques to combat such dysfunctions.

The proposed programs always presented the same three training components: range of motion exercises and muscle strengthening, training in compensatory postures and training in compensatory swallowing techniques, as suggested by several authors^(19; 20; 21). Two programs of functional swallowing reeducation were defined to be applied along the approach to Mr. A (Table 2).

Swallowing phase with greater number of changes	Program	Exercises	Time (min.)
Oral Phase (Program 1)	Muscle Strengthening Exercises	Lips; Tongue; Cheeks; Tongue and Cheeks; Lower jaw.	15'
	Compensatory postures	Reclining position; Cervical extension; Cervical rotation to the less functional side; Cervical rotation to the less functional side and cervical extension; Lateral decubitus with	10'

		head supported.	
	Compensatory swallowing techniques	Food cake control; Multiple swallowing; Effortless swallowing.	5'
Pharyngeal phase (Program 2)	Muscle Strengthening Exercises	Tongue and cheeks; Lower jaw; Larynx.	5'
	Compensatory postures	Reclining position; Cervical Flexion; Cervical Inclination.	5'
	Compensatory swallowing techniques	Thermal stimulation; Effort swallowing; Supraglottic swallowing; Super-supraglottic swallowing; Mendelsohn Maneuver; Masako's maneuver; Shaker exercise.	20'

Table 2: Exercises and techniques for the functional reeducation of swallowing (19;20;21).

Each training session had an average duration of 30 minutes, according to the evidence detected in the consulted bibliography(19). In addition to these sessions, as mentioned above, a rehabilitation nursing care plan was implemented.

The established care plan proved to be changeable throughout the functional swallowing reeducation program and, taking into account the holistic approach characteristic of this study, there were not only diagnoses centered on the “Swallowing” focus.

Nursing diagnoses were listed as: Self-care: Compromised drinking; Feeding dependent; Compromised airway cleanliness; Risk of aspiration; Risk of dehydration; Risk of compromise in nutritional intake; Sensory deficit present; Impaired body balance; Decreased muscle movement(12,16).

Nursing interventions were ensured in all sessions, aiming at the recovery of the swallowing function (documented by the evolution in the FOIS scale) as well as the rehabilitation of the person as a whole.

RESULTS

As mentioned above, Mr. A was part of a larger project, having started the swallowing functional reeducation program at the beginning of the project selection period.

After signing the informed consent, he completed a total of 10 sessions, with 4 assessments being carried out in total, respecting the interval of 3 sessions, and remained in the program until functional recovery from swallowing.

Decreased levels of awareness, the presence of fatigue and neurological alterations can compromise the person’s response and the maintenance of sufficient alertness to favor their participation in therapeutic sessions(22). Thus, before any intervention, the level of consciousness was always assessed through the application of the Glasgow Comas Scale.

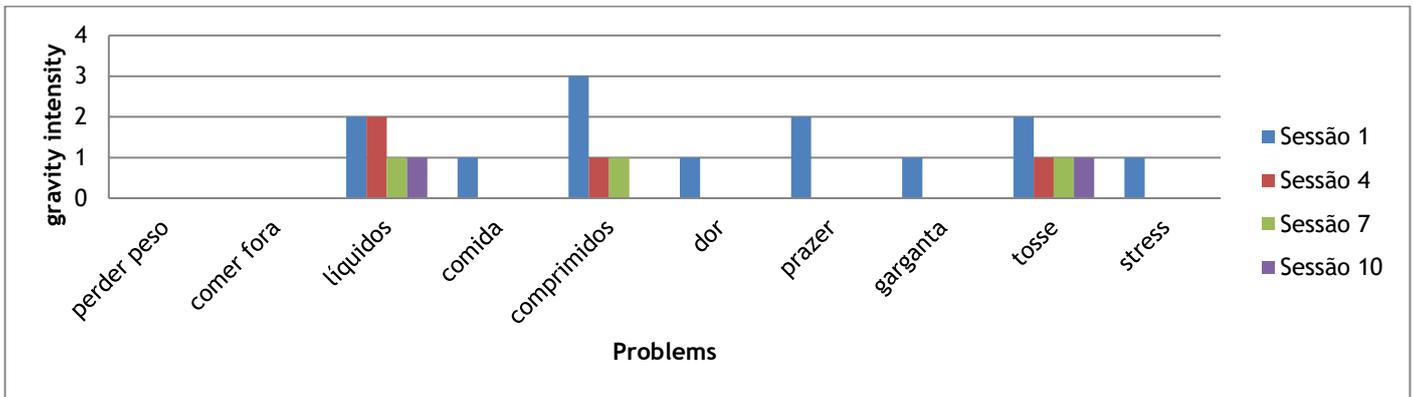
As mentioned above, it could be observed that Mr. A always remained alert and collaborative, with 15 points on that scale, both in the initial assessment and in the remaining assessments.

This was followed by the step of assessing the perception of swallowing changes, using the EAT-10 questionnaire. The questionnaire was always completed by Mr. A, only requiring guidance to filling it out on the day of the initial assessment.

In the analysis of the responses obtained in the EAT-10 questionnaires, it can be seen that the most frequently perceived problems resided at “swallowing liquids requires a greater effort” and “I cough when I eat”, being reported in all evaluations carried out. This fact suggested that these are the most disturbing problems for Mr. A throughout the swallowing functional reeducation program (Graph 1).

In the statistical analysis of the EAT-10 questionnaires, it was also verified that, although it was not reported in all evaluations, the difficulty in swallowing pills was also a relevant problem reported by Mr. A (Table 1).

In the first evaluation, the perception of the change in swallowing was evident, with a very high final score (13 points). However, at the end of the swallowing functional reeducation program, the score obtained was less than 3 points (2 points) (Table 2), suggesting a total remission of symptoms of impaired swallowing(3,5).



Graph 1: Results of the EAT-10 questionnaires Source: Own data

Statistical Data	Question - Keyterms									
	Losing weight	Going out for eating	Liquids	Food	Pills	Pain	Pleasure	Throat	Coughing	Stress
Average	0	0	1.5	0.25	1.25	0.25	0.5	0.25	1.25	0.25
Minimum	0	0	1	0	0	0	0	0	1	0
Maximum	0	0	2	1	3	1	2	1	2	1

Table 1: Statistical analysis of EAT-10 questionnaires Source: Own Data

Session	Score EAT-10
1	13
4	4
7	3
10	2

Table 2: Total Score EAT-10 Source: Own data

Regarding the clinical exploration of swallowing, through the application of the V-VST method, it was found that, in the seventh session, Mr. A was already tolerating liquid bolus, maintaining signs of alteration in the safety of swallowing in high volumes (20ml). Supervised fluid intake was recommended in medium volumes (10 ml) (Table 3).

In the tenth session, Mr. A was already ingesting high volumes of liquid (20 ml) without showing signs of compromising the safety or effectiveness of swallowing. It was found that Mr. A completed the swallowing functional reeducation program without presenting oxygen desaturation, a situation that was frequent at the beginning (Table 3).

Session	Last bolus with safety signs		Observed clinical signs	
	Consistency	Volume	Safety	Efficiency
1	Nectar	10 ml	Cough; Oxygen desaturation (4%)	Ineffective lip closure; Oral waste; Multiple Swallows; Pharyngeal waste.
4	Liquid	5 ml	Cough	--
7	Liquid	10 ml	Cough	--
10	Líquido	20 ml	--	--

Table 3: Overview of V-VST results Source: Own Data

The data obtained from the application of the V-VST clinical exploration method guided the selection of the most appropriate exercises and techniques.

In the initial session, program 1 was selected and program 2 was selected in the remaining sessions that Mr. A had a greater number of alterations in the pharyngeal phase, which justified the selection of program 2 more frequently.

Specialized rehabilitation nursing care inherent to the person with impaired swallowing was ensured, directed at the changes presented by Mr. A, aiming to achieve maximum functionality and autonomy.

Thus, regarding the diagnosis “compromised swallowing”, there was a progression of Mr. A’s autonomy in the degree of commitment throughout the program. Within the scope of “Knowledge” and “Learning Skills” dimensions, the changes in exercise program and swallowing techniques, from program 1 to program 2, contributed to the existence of some gaps in the transition phase. However, these gaps were being filled (Table 4).

The high adherence to the proposed swallowing exercises and techniques is highlighted.

Mr. A demonstrated increased capacity in the exercises and techniques that were performed more frequently throughout the swallowing functional reeducation program, with greater difficulty in performing the Masako maneuver (because it is a difficult technique to perform). The thermal stimulation technique was initially performed by the nurse. However, at the end of the program, Mr. A has already demonstrated the capacity to carry it out.

Diagnostic statement	Sessions			
Compromised swallowing	1	4	7	10
				--
Knowledge Dimension				
Diagnostic statement	Sessions			
Potential to improve knowledge about swallowing exercises and techniques	1	4	7	10
Dimension of Learning Skills				
Diagnostic statement	Sessions			
Potential to improve ability to perform swallowing exercises and techniques	1	4	7	10

Subtitle: moderate degree reduced degree dot not show show

Table 4: Evolution in nursing diagnoses related to the focus “Swallowing” Source: Own data

There was a greater lack of knowledge about the super-supraglottic swallowing technique. Although the Masako maneuver is the technique where the person showed greater difficulty in execution, this was not verified with the knowledge about it. Mr. A demonstrated more consistent knowledge of the therapeutic exercises given since the beginning of the program.

The family caregiver (wife) was not always present in all sessions, but correctly apprehended the activities and techniques addressed throughout the program. Like Mr. A, he demonstrated consistent knowledge of the techniques that were most frequently performed throughout the program. Both Mr. A and the family caregiver gradually acquired knowledge about the adapted consistency technique (use of thickener).

Taking into account the change in swallowing, the “risk of compromise in nutritional intake” was evident (16). At the end of the program, when Mr. A already had the functional capacity to ingest meals with two or more consistencies, this risk was no longer present. The BMI was monitored weekly and, as mentioned above, no changes were detected throughout the program.

In the analysis of the data obtained, it was found that Mr. A presented functional improvement in swallowing, as evidenced by the progression in the FOIS level. It should be noted that Mr. A completely reversed the swallowing changes, reaching level 7 on the FOIS scale (Table 5).

Session	FOIS Level
1	4
4	5
7	6
10	7

Table 5: Summary of categorization in the FOIS scale Source: Own data

DISCUSSION

The approach presented and the results achieved demonstrate that specialized rehabilitation nursing care can play an important role in early intervention on people with impaired swallowing and on their functional re-education.

Nurses are the professionals who spend more time with the person, being responsible for ensuring their autonomy and safety(2). It is recommended that, for an effective approach to persons with impaired swallowing, the need to face this reality as a priority for multidisciplinary action should be considered(2, 23).

Conducting studies in this area is essential to establish the effectiveness of rehabilitation in persons with specific swallowing disorders, to define the appropriate treatment to maximize costs and produce positive results(8). In order to achieve this objective, this case included the assessment of swallowing through the application of valid, reliable, responsive and efficient assessment instruments(24) and the implementation of a swallowing optimization program based on the detected changes. This set of interventions aimed at the functional recovery of the studied person's swallowing.

In selecting the most appropriate set of exercises and swallowing techniques, the use of the EAT-10 and V-VST instruments was essential to characterize the observed alterations(3,4).

The presence of swallowing changes can lead to feelings of depression and anxiety during meals(3). The application of the EAT-10 tool made possible to measure the degree of severity of symptoms, monitor the effectiveness of the established program(3,5) and detect the most frequently perceived problems that most disturbed the person approached. There was a significant reduction in reported symptoms.

The combination of the EAT-10 tool with the V-VST clinical exploration method presents great precision with regard to the detection of swallowing alterations(4). The results presented with the application of these instruments evoke the need for clinical screening and skill training by someone with

skills in swallowing assessment, capable of determining the presence, severity and mechanism of alteration^(7,23).

The V-VST allowed the detection of changes in the safety and effectiveness of swallowing and provided the necessary data to demonstrate that, at the end of the program, the studied person was already tolerating high volumes of fluids, which suggests the effectiveness of the planned interventions.

According to the clinical manifestations observed, it was essential to adjust the muscle strengthening exercises, compensatory postures and techniques that facilitate swallowing⁽¹⁹⁾ throughout this approach. Such adjustment allowed the individualization of the swallowing functional reeducation program.

The functional re-education of swallowing in a person with a stroke should include therapeutic measures focused on increasing oral sensitivity, oral motor exercises and compensatory maneuvers in order to prevent aspiration⁽²⁵⁾. Such aspects were always addressed in the two proposed rehabilitation programs.

Positive reinforcement was essential and necessary to achieve the goals outlined for the functional re-education program⁽²⁶⁾ of swallowing. In the case analyzed, the person demonstrated, in general, to have knowledge and ability to perform exercises and swallowing techniques, with positive reinforcement being the key to such success.

The person's difficulty in performing certain therapeutic exercises, mainly in the scope of compensatory techniques of swallowing, was related to the presence of motor and sensory deficits that made it impossible for them to be independent in their performance.

In order to implement self-care and self-control, a structured approach to rehabilitation nursing care is needed, involving family and informal caregivers in the proposed interventions⁽²⁷⁾. Thus, the participation of the informal caregiver in the person's rehabilitation process proved to be essential, reinforcing their role in the continuity and reinforcement of the care provided.

Aiming to promote the re-adaptation processes and promote the capacity for self-care⁽²⁸⁾, the importance of planning rehabilitation nursing care based on nursing diagnoses in accordance with the observed changes is highlighted.

The effectiveness of the care method advocated by Dorothea Orem depends, to a large extent, on the nurse's creativity, appreciation, knowledge about and respect for the person. An environment favorable to development is also an environment favorable to learning.⁽²⁹⁾ The approach explained in this study is based on Dorothea Orem's theory of self-care deficit, which focuses on the role of Nursing in learning and developing the skills of the person being cared for.

The clinical reasoning that the nurse makes culminates in a diagnosis and involves making decisions based on the identification of the person's clinical conditions

(diagnostic criteria), in this sense, the greater the accuracy of a diagnosis, the more accurate the clinical decision process should be⁽³⁰⁾. The use of instruments that allowed the assessment of swallowing alterations contributed to the definition of diagnostic criteria for rehabilitation nursing.

On the other hand, these instruments helped to assess the progress of the person's state with the intervention of the Rehabilitation Nurse and, together with the implemented interventions, contributed to the functional re-education of swallowing, this purpose being attested by the progression in the FOIS scale.

The study of this case allowed us to reflect on the relevance of the systematic assessment of swallowing and reinforce the idea that the nutritional risk of a person with a stroke requires continuous monitoring and effort⁽³¹⁾.

From the results of the implementation of this program, some limitations stand out. It would be essential, in future research, to extend the time available for the implementation of different therapeutic activities, allowing for more consistent results. Likewise, the fact that only one person's case is addressed makes it impossible to make inferences about the results obtained.

There are not many publications by nurses in the area of functional re-education of swallowing. In this way, this exhibition can give visibility to the interventions of rehabilitation nurses on the person with this change. Thus, the need to carry out more studies on this theme becomes emergent, namely experimental or quasi-experimental studies.

The case presented may contribute to a properly systematized specialized nursing practice, enabling the dissemination of knowledge about the intervention of the rehabilitation nurse with the person with impaired swallowing, with a view of strengthening the teaching and practice of this specialty.

FINAL THOUGHTS

This case study highlighted the effectiveness of rehabilitation nursing interventions in the context of promoting the safety and functionality of persons with impaired swallowing, which is a possible approach to take into account in persons with alterations of this nature.

Throughout the implemented program, it was essential to detect the person's ability to eat and hydrate safely and effectively, this was possible through constant monitoring of awareness using the Glasgow Coma Scale.

The assessment of the risk of changes in swallowing was possible using the EAT-10 questionnaire, which allowed for the identification of symptoms of impaired swallowing and its degree of severity.

The clinical signs identified with the application of the clinical exploration method (V-VST) were fundamental for the selection of the appropriate set of exercises.

The assessment instruments (FOIS, EAT-10 and V-VST) in addition to helping to define the stated rehabilitation nursing diagnoses, made the diagnostic criteria more objective, facilitating the implementation of diagnostic action statements and interventions for nursing appropriate to the person's clinical situation and the observed dysfunction, and allowed a holistic and personalized approach.

The evolution of the person approached was visible through the results obtained in the application of the assessment instruments and the positive progression in the degree of commitment in the stated nursing diagnoses. Nursing interventions proved to be effective in reversing swallowing changes and contributed to improve the autonomy and independence of the studied person.

Throughout the program, the risk of compromise in nutritional intake was evident, but no large fluctuations in BMI values that could prove such compromise were observed.

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PROPIEDADES MÉTRICAS DO OXFORD KNEE SCORE EM PESSOAS COM OSTEOARTRITE APÓS ARTROPLASTIA DO JOELHO: REVISÃO SISTEMÁTICA DA LITERATURA

PROPIEDADES MÉTRICAS DEL OXFORD KNEE SCORE EN PERSONAS CON OSTEOARTRITIS DESPUÉS DE LA ARTROPLASTIA DE LA RODILLA: REVISIÓN SISTEMÁTICA DE LA LITERATURA

METRIC PROPERTIES OF THE OXFORD KNEE SCORE IN PEOPLE WITH OSTEOARTHRITIS AFTER KNEE ARTHROPLASTY: SYSTEMATIC REVIEW OF LITERATURE

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Maria Adelaide Conceição Martins Silva Xavier¹; Ana Sofia Carvalho Da Guia²; Carla Sofia Mota Ascenso³; Joana Isabel Pissarra Preto⁴; Luís Manuel Mota De Sousa^{5,6}

1 - Centro Hospitalar Lisboa Norte, EPE - Polo Hospital Santa Maria | Empresa de Cuidados Domiciliários Integrados com Base nas Novas Tecnologias - "Satélite Familiar"; 2 - Hospital de Santa Maria, Centro Hospitalar Lisboa Norte, E.P.E.; 3 - Centro Hospitalar da Universidade de Coimbra; 4 - Fundação Champallimaud; 5 - Hospital Curry Cabral, Centro Hospitalar Universitário Lisboa Central; 6 - Escola Superior de saúde Atlântica.

RESUMO

Objetivo: Avaliar as propriedades métricas da Oxford Knee Score aplicada em pessoas com osteoartrite após artroplastia do joelho.

Método: Revisão sistemática da literatura. Recorreu-se à plataforma EBSCOhost que permitiu aceder à base de dados MEDLINE e LILACS e plataforma SCiELO. Os descritores foram validados nas plataformas DeCS e MESH, à exceção de "Oxford Knee Score" e "responsividade". Foram selecionados artigos publicados nos últimos cinco anos, disponíveis em português, inglês e espanhol.

Resultados: Obtiveram-se oito artigos que revelaram que o Oxford Knee Score é um instrumento válido, fiável e reprodutivo. A responsividade foi a propriedade métrica menos estudada.

Conclusão: O Oxford Knee Score é adequado para avaliar a funcionalidade e o impacto da dor em pessoas com Osteoartrite após artroplastia do joelho.

Descritores: Estudos de Validação; Reprodutibilidade dos Testes; Joelho; Osteoartrite; Avaliação em Enfermagem

RESUMEN

Objetivo: Evaluar las propiedades métricas de la Oxford Knee Score aplicada en personas con osteoartritis después de la artroplastia de la rodilla.

Método: Revisión sistemática de la literatura. Se recurrió a la plataforma EBSCOhost que permitió acceder a la base de datos MEDLINE y LILACS y plataforma SCiELO. Los descriptores fueron validados en las plataformas DeCS y MESH, con excepción de "Oxford Knee Score" y "responsividad". Se seleccionaron los artículos publicados en los últimos cinco años, disponibles en Portugués, Inglés y Español.

Resultados: Se han obtenido ocho artículos que revelaron que Oxford Knee Score es un instrumento válido, fiable y reproductivo. La responsividad fue la propiedad métrica menos estudiada.

Conclusión: El Oxford Knee Score es adecuado para evaluar la funcionalidad y el impacto del dolor en personas con Osteoartritis después de la artroplastia de la rodilla.

Descriptor: Estudios de Validación; Reproducibilidad de los Resultados; Rodilla; Osteoartritis; Evaluación en Enfermería

ABSTRACT

Objective: To evaluate the metric properties of the Oxford Knee Score (OKS) applied in people with osteoarthritis after knee arthroplasty.

Method: Systematic review of the literature. The EBSCOhost platform was used to access the MEDLINE and LILACS database and the SCiELO platform. The descriptors were validated on the DeCS and MESH platforms, except for "Oxford Knee Score" and "responsiveness". We selected articles published in the last five years, available in Portuguese, English and Spanish.

Results: There were eight articles that revealed that OKS is a valid, reliable and reproducible instrument. Responsiveness was the least studied metric property.

Conclusion: The Oxford Knee Scale is adequate to evaluate the functionality and the impact of pain in people with Osteoarthritis after knee arthroplasty.

Descriptors: Validation Studies; Test Reproducibility; Knee; Osteoarthritis; Reliability; Nursing Assessment

INTRODUCTION

Nursing, like all sciences, has been going through political, social and economic transformations over time, in order to fit in with the development and globalization process of our decade. As such, there is a need to implement a practice based on scientific evidence, combining training with the profession, supporting health gains that come from nursing practice.⁽¹⁾

In Rehabilitation Nursing, it is essential to use assessment tools to identify changes in activities of daily living, cognitive, sensory and motor, cardiorespiratory, nutrition, elimination and sexuality. The use of these instruments also allows nurses to monitor the progress of their intervention, documenting the effectiveness and benefit of the rehabilitation plan.⁽²⁾

The Oxford Knee Score (OKS) is an instrument consisting of a twelve-question questionnaire and has a two-dimensional characteristic, as it assesses the component of pain and functionality.⁽³⁾ This scale was developed and validated by researchers at the University of Oxford to function as an instrument to measure outcomes after knee arthroplasty in people with osteoarthritis (OA).⁽⁴⁾ The OKS is a commonly used instrument to assess symptoms and functional status in persons with knee OA.⁽⁵⁾

The use of OKS has been increasing, as is the need to be validated in different countries, given the increase in persons with knee OA. Statistical data demonstrates substantial growth in persons with OA.

In Portugal, rheumatic diseases have an approximate prevalence of 20 to 30%, and are the main cause of disability among elderly with impairment of joints that are important for functionality, such as the hand, knee, hip, spine and foot. Arthroplasty has improved the prognosis of the person with OA.⁽⁶⁾ This information is comparable to a study carried out in England, which states that the population of the United Kingdom is growing in number and age, and that OA Knee is more common in older people. The number of persons with knee OA is estimated to increase to 5.4 million in 2020 and 6.4 million in 2035.⁽⁷⁾

The aim of this systematic literature review (SLR) was to assess the metric properties of OKS, in order to verify if it is valid, reliable, reproductive and responsive when used in persons with OA.

MATERIALS AND METHODS

An SLR was chosen, as it uses a systematic, explicit and reproducible method based on a clearly formulated question, which allows the identification, evaluation and synthesis of primary studies.^(8,9)

The research question was formulated from the PICO strategy,⁽¹⁰⁾ considering the recommendations of the Joanna Briggs Institute (JBI),⁽¹¹⁾ where each dimension of the PICO⁽¹⁰⁾ contributed to define the inclusion criteria: Population (P) - People with osteoarthritis of the knee; Area of Interest (I) - metric properties of the Oxford Knee Score scale and Context (Co) - knee arthroplasty. Thus, the following research question was defined for this SLR: "What are the metric properties of the Oxford Knee Score scale in persons with OA of the knee?"

The investigation took place during the month of October 2014, and two independent researches were carried out on database platforms: EBSCOhost which allowed access to the MEDLINE and LILACS databases; to the SCIELO platform. The descriptors were previously validated on the DeCS and MESH platforms:

- Measurement/Psychometrics properties;
- Validation/Validation;
- Validity of results/Validity of results;
- Reproducibility of tests/Reproducibility of tests;
- Reliability/Reliability;
- Knee/Knee, Osteoarthritis/Osteoarthritis.

However, the following keywords were used: Oxford Knee Score and Responsividade/Responsiveness, which are not validated as descriptors in both platforms, but which play a fundamental role in making the research as concise as possible.

The inclusion and exclusion criteria that allowed the selection of articles are described in table 1.

Selection criteria	Inclusion criteria	Exclusion criteria
Participants	Person with knee osteoarthritis	Person with other knee pathology and children
Area of interest	Validity, reliability, reproducibility and responsiveness	Do not mention at least one of these criteria
Study design	Quantitative study	Qualitative study, reviews, opinion articles
Publication period	Article published between 2009 and 2014	
Language in which it is published	Article published in English, Portuguese and Spanish	
Document availability	Full article and free access	Incomplete article or payment is required

Table 1 – Inclusion and Exclusion Criteria

The search was carried out using the Boolean combination of descriptors, identified in Table 2. The search was carried out by two reviewers

independently, to ensure the rigor of the method and the reliability of the results. The articles to be included in the sample were selected in the following sequence: title reading, abstract reading and full text reading, following the PRISMA recommendations (Figure 1).

Boolean Conjugation	Search results
Oxford Knee Score AND knee osteoarthritis	34
Oxford Knee Score AND assessment	168
Oxford Knee Score AND psychometrics	16
Oxford Knee Score AND validity	23
Oxford Knee Score AND reliability	15
Oxford Knee Score AND reproducibility	19
Knee AND pain AND physical function	1323
Oxford Knee Score AND validation AND cultural	9
Oxford Knee Score AND responsiveness	4
TOTAL	1611

Table 2 – Boolean conjugation

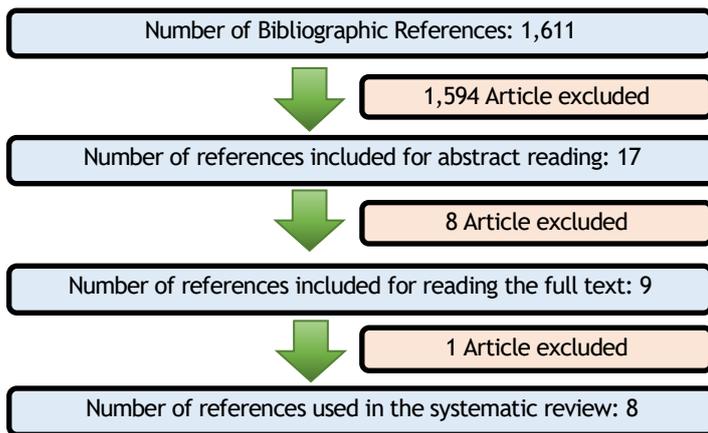


Figure 1 – Flowchart

The eight articles presented $\geq 75\%$ of the JBI evaluation criteria; therefore, they were considered of methodological quality and included in the SLR sample.

The study of metric properties was carried out based on the criteria of Validity, Reproducibility and Responsiveness.⁽¹²⁻¹³⁾

RESULTS

After reading nine articles in full, one was eliminated and eight were used for this SLR. We surveyed information about the year, country, author, participants, interventions, results and the level of evidence (Table 3). All articles presented evidence level III, that is, evidence from well-designed experiments, such as non-randomized studies, cohort

studies, time series or combined case-control studies.⁽¹⁴⁾

The eight articles analyzed come from several countries, namely, China,⁽²²⁾ Korea,⁽¹⁵⁾ France,⁽¹⁸⁻¹⁹⁾ England,⁽¹⁷⁾ Japan,⁽²¹⁾ Portugal⁽¹⁶⁾ and Switzerland.⁽²⁰⁾ Were published between 2009 and 2013. All present evidence level III⁽¹⁴⁾. Samples ranged from 51⁽²¹⁾ to 187⁽²²⁾ participants with knee OA. These studies verified the reproducibility, reliability and validity, however, three^(17, 19, 21) demonstrated responsiveness.

DISCUSSION

With regard to reproducibility, Naal *et al.*⁽²⁰⁾ studied reliability through internal consistency (Cronbach's α of 0.83) and an intraclass correlation coefficient (ICC) of 0.91. Jenny and Diesinger⁽¹⁸⁾ verified the intra-observer reliability through the Cronbach's α value, which was 0.88, similar to the original scale,⁽⁴⁾ whose value was 0.87. Furthermore, the values of the inter-observer reliability were also similar.

In the study by Xie *et al.*⁽²²⁾, reliability has a Cronbach's α value of 0.896. Reliability in the study by Takeuchi *et al.*⁽²¹⁾ was demonstrated through test-retest, with an ICC of 0.85, and internal consistency was assessed by Cronbach's α with a value of 0.90. The study by Jenny and Diesinger⁽¹⁹⁾, in evaluating internal reliability, revealed a Cronbach's α of 0.88 before surgery and 0.66 after surgery, and no significant associations for this phenomenon were demonstrated.

In the Portuguese version⁽¹⁶⁾, for internal consistency, Cronbach's α of 0.87. The reproducibility, measured by the CCI, was 0.97 and that proves to be adequate.

Harris *et al.*,⁽¹⁷⁾ verified the internal consistency, with Cronbach's α of 0.94 for OKS, 0.88 for the OKS-physical component (OKS-FCS) and 0.90 for the OKS-pain component (OKS-PCS). The test-retest revealed a CCI for the OKS of 0.93, for the OKS-PCS of 0.91 and for the OKS-FCS of 0.93. In the study by Eun *et al.*,⁽¹⁵⁾ the internal reliability was demonstrated with Cronbach's α of 0.932 and the inter-observer reliability by Cohen's kappa between 0.61-0.87. Through the test-retest, the CCI of 0.848 was obtained, demonstrating the reproducibility of the questionnaire.

In all the versions studied, the scale proved to be reliable, being superior to 0.70,⁽¹²⁻¹³⁾ except in the study by Jenny and Diesinger⁽¹⁹⁾, in the evaluation after surgery.

In the validation and adaptation of the OKS to the German version, carried out by Naal *et al.*,⁽²⁰⁾ the construct validity was assessed by comparing OKS and the Western Ontario and McMaster Universities Index (WOMAC), Knee Society Score (KSS) scales, Activities of Daily Living Scale (ADLS), Short Form - 12 (SF-12). A higher correlation was found between the German OKS and ADLS ($p < 0.001$), this may be related to the specific characteristics of the knee assessed by the scale, while WOMAC focuses on the specificities of the disease. The lowest coefficient of relationship found was with the SF-12 ($\rho = 0.02$).

Author, year, country	Participants	Objective	Results	EL
Eun IS, Kim OG, Kim CK, Lee HS, Lee JS. 2013, Korea ⁽¹⁵⁾	142 participants subjected to knee arthroplasty	To validate the Korean version of OKS in people undergoing arthroplasty	In this study, reliability, validity and reproducibility were confirmed. Comparison with Visual Analog Scale and Short Form - 36. Responsiveness was not determined due to the short time in which the test-retest was performed.	III
Gonçalves RS, Tomás AM, Martins DI. 2012, Portugal ⁽¹⁶⁾	80 participants who underwent knee arthroplasty for OA and who were undergoing treatment	To adapt OKS to the Portuguese version and validate its metric properties	The adaptation of OKS to the Portuguese language demonstrated reliability, reproducibility and validity. Comparison with Visual Analog Scale and Short Form - 36: Responsiveness was not assessed due to the impossibility of performing a sufficient number of retests.	III
Harris KK, Dawson J, Jones LD, Beard DJ, Price AJ. 2013, England ⁽¹⁷⁾	134 participants with knee OA subjected to non-surgical treatment	To assess the validity of OKS when applied to people with knee OA undergoing non-surgical treatment	Comparison with Intermittent and Constant Osteoarthritis Pain, Knee Injury and Osteoarthritis Outcome Score-Physical, Short Form -12 . OKS has proven to be a reliable, valid and responsive tool in people with OA without surgical indication.	III
Jenny JY, Diesinger Y., 2011, France ⁽¹⁸⁾	100 participants with OA awaiting knee arthroplasty	To validate OKS for French version	OKS in the French version proves to be a valid and reliable tool, according to the authors, safer when used on a person awaiting surgery. Comparison with International Knee Society Score. Reproducibility was not ascertained, as was responsiveness.	III
Jenny JY, Diesinger Y., 2012, France ⁽¹⁹⁾	100 participants with OA awaiting surgery and 100 undergoing knee arthroplasty surgery	To compare the validity of OKS applying it before and after knee arthroplasty	Comparison with American Knee Score. The scale is valid and responsive, however it offers safer results when applied to people awaiting surgery	III
Naal FD, Impellizzeri FM, Sieverding M, Loibl M, Von Knoch F, Mannion AF, Leunig M, Munzinger U., 2009, Switzerland ⁽²⁰⁾	100 participants undergoing knee arthroplasty surgery for the first time	To validate OKS for German language and evaluation of its metric properties when applied to people with OA of the knee.	Comparison with Western Ontario and McMaster Universities Index, Knee Society Score, Activities of Daily Living Scale and Short Form-12. OKS validation for the German language is a valid and reliable tool for self-assessment of pain and physical function.	III
Takeuchi R, Sawaguchi T, Nakamura N, Ishikawa H, Saito T, Goldhahn S., 2011, Japan ⁽²¹⁾	51 participants with knee pathology, without arthroplasty	To validate OKS for Japanese language and evaluate its metric properties	Comparison with Western Ontario and McMaster Universities Index and Short Form - 36. The OKS validated for the Japanese language proves to be a reliable, valid and reproducible tool. However, due to a low floor effect (9%) it was not possible to determine the responsiveness.	III
Xie F, Ye H, Zhang Y, Liu X, Lei T, Li SC., 2011, China ⁽²²⁾	187 participants with OA	To assess the OKS for its validity and reliability in measuring health outcomes in people with OA	Comparison with Short-Form - 6D, EuroQoL Group 5-Dimension Self-Report Questionnaire score and Visual Analog Scale. Validity and reliability have been proven, however responsiveness has not been ascertained.	III

Table 3 – Studies description

In the study by Jenny and Diesinger,⁽¹⁸⁾ it was found that there is concurrent validity between the OKS and KSS questionnaire, and the correlation is negative, as the results of both scales are inverse.

Construct validity in the study by Xie et al.⁽²²⁾ was assessed using Spearman's correlation coefficient (ρ) and compared with the Short Form (SF) - 6D scale, with the EuroQoL Group 5- Dimension Self-Report Questionnaire (EQ-5D) and Visual Analog Scale (VAS), with moderate to strong correlation between them. The correlation between the OKS and the mental health domain, assessed by the SF-6D, and the anxiety/depression domain assessed by the EQ-5D, was strong, contrary to what would be expected, compared to results from previous studies, such as Dunbar and collaborators⁽²³⁾ in the validation of OKS

for the Swedish version. This might mean that OA affects person's quality of life, not only physically but also psychologically.

In Takeuchi et al.,⁽²¹⁾ validity was demonstrated by construct validity through Spearman's correlation coefficient (ρ), comparing OKS with WOMAC (pain, stiffness and physical function) and SF-36 (physical function, physical state, physical pain, general health status, vitality, social function, emotional status and mental health). This showed convergent validity with WOMAC and SF-36 (function, physical state and pain) and divergent validity between OKS and SF-36 (general health, vitality, emotional aspect and mental health).

To assess validity, Jenny and Diesinger,⁽¹⁹⁾ used the Spearman correlation coefficient (ρ) between OKS and

the American Knee Score (AKS); the result was negative either before or after surgery. It should be noted that the OKS results are inverse to those of the AKS, that is, lower results on the OKS indicate good knee condition and the opposite is true for the AKS. Thus, it is concluded that a negative correlation indicates a good clinical correlation in terms of construct validity, with a value of $p < 0.05$ in most correlations.

In validating the OKS for the Portuguese version,⁽¹⁶⁾ the construct validity of the OKS was measured using the Spearman correlation coefficient (ρ), in which the OKS was correlated with SF-36 and VAS, verifying that the three measures assess similar constructs. Since OKS varies from best to worst state, SF-36 varies from worst to best state, and in turn VAS varies from best to worst state, it was expected that OKS would relate negatively to SF-36 and positively to VAS. This correlation was confirmed by a value of $\rho = 0.05$. OKS was negatively related to SF-36 for values between -0.28 and -0.77; in turn, OKS was positively related to VAS for values between 0.39 and 0.44. The negative relationship of OKS with SF-36 is a good correlation, and the inverse of passes with the correlation between OKS and VAS.

For Harris et al.,⁽¹⁷⁾ the OKS and subscales, the OKS-PCS (pain) and OKS-FCS (physical function), are likely to be applied in people with knee OA without surgical indication, as a way to monitor the evolution (improvement or deterioration) of pain and physical function. In this sense, to demonstrate the construct validity, the OKS was compared with the Knee injury and Osteoarthritis Outcome Score-Physical (KOOS-PS), Intermittent and Constant Osteoarthritis Pain (ICOAP) and SF-12, using Spearman's correlation coefficient. This comparison revealed a strong correlation between OKS, KOOS-PS and ICOAP, being higher than predicted compared to SF-12 PCS in the pain domain and, as expected, a weak correlation with SF-12 MCS (mental component). It was also shown that OKS-PCS is more correlated with ICOAP than with KOOS-PS and that OKS-FCS is more correlated with KOOS-PS than with ICOAP, providing evidence for convergent and divergent validity. In the study by Eun et al.,⁽¹⁵⁾ the validity of OKS was obtained through the concurrent validity of $r = 0.692$ and $p < 0.001$ between OKS and VAS, and the construct validity between OKS and SF-36 ($r = -0.74$), this being considered convergent, in the domains of physical function and pain, and divergent in the other domains.

The validity of the OKS in all studies was verified by the correlation with scales that assess the same construct, that is, through the concurrent/divergent validity,⁽¹²⁻¹³⁾ with moderate to strong and significant correlations with the scales used in the comparisons. . That is how the validity of the OKS was verified in people with OA in the postoperative period of knee arthroplasty.

Regarding responsiveness, Takeuchi et al.,⁽²¹⁾ verified the floor effect and ceiling effect, which correspond, respectively, to the worst score and the best score.⁽¹²⁻¹³⁾ In the questionnaires evaluated, the sample

corresponding to the floor effect was very low (9%), and it is not possible to determine the responsiveness.

In the study by Jenny and Diesinger,⁽¹⁹⁾ responsiveness was assessed through the applicability of OKS before and after knee arthroplasty, and it was concluded that the group of people awaiting surgery had a null floor effect and a low ceiling effect. Inversely, in the group of people undergoing surgery, it was found that the floor effect was substantial and that the ceiling effect was null. The ceiling effect suggests that people awaiting surgery suffer from severe pain and functional disability; after surgery, the strongly present floor effect suggests that there is an improvement in physical and functional well-being, but it does not allow us to understand differences in results between two different people.

In Harris et al.,⁽¹⁷⁾ these scales were applied on the first day and three months later, and OKS revealed that 15% of people showed deterioration in their health status, 30% showed improvement in their health status and 55% did not reflect any change, thus confirming its responsiveness.

OKS is reliable, reproducible and valid.⁽¹⁵⁻²²⁾ These results are similar to versions validated for other languages, such as Chinese,⁽²⁴⁾ Dutch,⁽²⁵⁾ Italian,⁽²⁶⁾ Swedish⁽²³⁾ and Thai.⁽²⁷⁾

The OKS allows self-assessment of pain and physical function in people with knee OA⁽²⁰⁾, however, it offers safer results when applied to people who have not yet undergone surgery.⁽¹⁹⁾

In this review, it is verified that the Portuguese version of the OKS is a reliable, reproductive and valid instrument to be used in the Portuguese population.⁽¹⁶⁾

Regarding responsiveness, it was only demonstrated in two studies.^(17,19)

Practical implications for future investigations

The study of the metric properties of OKS reveals that it is effectively a reliable instrument, valid in several languages, including European Portuguese, when used before any procedure, whether surgical or non-surgical. However, it is suggested that the verification of OKS responsiveness be considered in future studies.

The use of a valid, reliable, reproducible and responsive scale in clinical practice allows us to guarantee the objectivity and accuracy of the results obtained, helping the rehabilitation nurse to make more appropriate clinical judgments and verify the gains obtained with their intervention.

This scale can be used before surgery and four weeks after surgery, as this is the period that is included in the scale, that is, it addresses how the person feels in the last four weeks, regarding pain and the performance of activities of daily living.^(3,28)

Study limitations

It can be mentioned as a limitation, the inclusion of articles available only in English, Portuguese and Spanish and, on the other hand, the inclusion of complete articles with free access.

CONCLUSION

After analyzing and interpreting the articles included, the results found allow us to answer the defined research question. However, it is not possible to compare all the included studies, as they are not homogeneous in the sample, in the various concepts they assessed, as well as in the different strategies used.

Despite the geographic, cultural and socioeconomic differences, where the different studies were carried out, it should be noted that it was possible to assess the metric properties of the OKS when applied to persons with OA.

The assessment of internal consistency was demonstrated using Cronbach's α , which was found to be greater than 0.70 in all selected studies, thus demonstrating the reliability of the scale, except in one study carried out postoperatively. Validity was demonstrated by construct validity, using Spearman's correlation coefficient (ρ), when comparing the OKS with other scales selected for each study. Reproducibility was also only confirmed in a few studies using the CCI, obtained through test-retest. Responsiveness was not ensured in all analyzed studies, as not all of them had established a floor effect and/or ceiling effect, or a sufficient period of time to assess change in health status.

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A INTERVENÇÃO DO ENFERMEIRO DE REABILITAÇÃO NA PROMOÇÃO DA ACESSIBILIDADE

LA INTERVENCIÓN DE LOS ENFERMEROS DE REHABILITACIÓN EN LA PROMOCIÓN DE LA ACCESIBILIDAD ARQUITECTÓNICA

THE ROLE OF REHABILITATION NURSES TO THE ARCHITECTURAL ACCESSIBILITY PROMOTION

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Rute Salomé Da Silva Pereira¹; Maria Manuela Martins¹ ; Bárbara Gomes¹;
Jose Alberto Laredo Aguilera²; João Santos¹

1 - ESEP; 2 - Universidad de Castilla-La Mancha

RESUMO

Enquadramento: os enfermeiros de reabilitação são decisivos na promoção de ambientes acessíveis pela eliminação de barreiras arquitetónicas para a reintegração das pessoas com mobilidade condicionada.

Objetivos: Compreender se a eliminação de barreiras arquitetónicas são uma preocupação dos enfermeiros.

Metodologia: estudo quantitativo, descritivo, exploratório. Técnica de amostragem não probabilística acidental em bola de neve, constituída por 56 enfermeiros. A colheita de dados efetuou-se através de um questionário *ad hoc* de autopreenchimento recorrendo ao formulário *GOOGLE*, em Novembro de 2016.

Resultados: 60,7% dos enfermeiros não sabe a quem se dirigir para eliminar barreiras arquitetónicas e 58,9% não desenvolve nenhum tipo de intervenção nesse sentido. Verificamos diferenças significativas favoráveis aos enfermeiros de reabilitação em relação a deterem mais conhecimento sobre: legislação específica para a acessibilidade ($p=0,000$) e, a quem se dirigir para solicitar a eliminação de barreiras arquitetónicas na comunidade ($p=0,024$).

Conclusão: a acessibilidade e a eliminação de barreiras arquitetónicas devem fazer parte da prática diária dos enfermeiros.

Descritores: enfermagem em reabilitação; estruturas de acesso; pessoas com deficiência; limitação da mobilidade

RESUMEN

Marco contextual: Los enfermeros de rehabilitación son decisivos en la promoción de espacios accesible mediante la eliminación de barreras arquitectónicas para la integración de las personas con movilidad reducida.

Objetivo: Comprender si la eliminación de barreras arquitectónicas son una preocupación de los enfermeros

Metodología: estudio cuantitativo, descriptivo, exploratorio mediante un muestreo no probabilístico accidental en bola de nieve, con una muestra de 56 enfermeros. Se aplicó un cuestionario *ad hoc* de auto-llenado con recurso al formulario *GOOGLE*, en noviembre de 2016.

Resultados: 60,7% de enfermeros no saben a quién se deben dirigir para eliminar barreras arquitectónicas, el 58,9% no realiza ningún tipo de intervención en este sentido. Se observa diferencias significativas a favor de enfermeros de rehabilitación que tienen mayor conocimiento sobre: legislación específica para la accesibilidad ($p=0,000$) y a quién deben de dirigir la solicitud de eliminación de barreras arquitectónicas en la comunidad ($p=0,024$).

Conclusión: La accesibilidad e la eliminación de barreras arquitectónicas deben ser una parte de la práctica diaria de los enfermeros.

Descriptorios: enfermería en rehabilitación; estructuras de acceso; personas con discapacidad; limitación de la movilidad

ABSTRACT

Background: the rehabilitation nurses are decisive to the promotion of accessibility trough architectural barriers elimination, which promotes the reintegration of persons with reduced mobility.

Objectives: to understand nurses' concernment about the elimination of architectural barriers.

Methodology: a quantitative, descriptive, exploratory study using an accidental non-probabilistic snowball sampling method, composed of 56 nurses. For data collection, an *ad hoc* self-administered questionnaire was applied, using Google forms, in November 2016.

Results: 60.7% of nurses don't know whom to adress to eliminate barriers and 58.9% did not implement any intervention in that sense. Verified significant statistical differences that favor the rehabilitation nurses concerning their knowledge about: specific legislation about acessibility ($p=0.000$) and whom to adress to request the elimination of architectural barriers in the community ($p=0.024$).

Conclusion: the accessibility and the elimination of architectural barriers should be a part of the daily practice of nurses.

Descriptors: rehabilitation nursing; architectural accessibility; disabled persons; mobility limitation

INTRODUCTION

The influence and impact that the built environment has on people encourages them to create adaptable responses in the environment. Thus, the environment affects self-care and an adequate environment allows for personal development, the maintenance of independence despite individual capacity, the establishment of real goals and the adaptation of behavior to achieve these results. ^(1,2,3)

Architectural barriers are present in the various spaces and contexts of our day-to-day life and are considered obstacles built in the urban environment or in buildings and that prevent or hinder the free movement of persons who experience a temporary or permanent disability. ^(4,5)

In an accessible environment a person with mobility in a wheelchair, blind or elderly, does not show difficulty, but anyone in an inaccessible environment can experience mobility impaired. ⁽⁶⁾

It is essential to understand the intervention of the rehabilitation nurse in eliminating architectural barriers and promoting accessible environments for people with limited mobility. According to the Regulation of Specific Competences of the Specialist Nurse in Rehabilitation Nursing, this professional "enables the person with a disability, activity limitation and/or participation restriction for the reintegration and exercise of citizenship" and "promotes mobility, accessibility and social participation" for the demonstration of knowledge about specific legislation, awareness of the community for the adoption of inclusive practices, identification and elimination of architectural barriers, and also being able to issue technical-scientific opinions on the structures and social equipment of the community. ⁽⁷⁾

The study of this phenomenon should not only focus on the perspective of the person with limited mobility, but should be extended to other actors involved in this process, such as rehabilitation nurses, exploring new paths and a holistic approach to the rehabilitation process, intervening equally way, in the physical dimension, but also in other dimensions such as the social inclusion of people with disabilities. ⁽⁸⁾

The rehabilitation nurse has a preponderant role in creating conditions that help the person with limited mobility, promoting participation in the community, favoring their autonomy and independence.

With this study we aim to: understand whether architectural accessibility and the elimination of architectural barriers for persons with limited mobility are a concern of nurses; to analyze the differences between rehabilitation nurses and other nurses regarding architectural accessibility.

The purpose of this study is to sensitize rehabilitation nurses to the promotion of architectural accessibility,

in order to extend the provision of care to the level of reintegration into society and the exercise of citizenship.

Given the context, we ask ourselves: Do rehabilitation nurses have increased knowledge about the elimination of architectural barriers?

Having as research questions:

- How do nurses position themselves on the promotion of architectural accessibility?
- Are there differences between rehabilitation nurses and other nurses regarding accessibility?

This research is a previous study entitled "Architectural barriers - context of nurses" as part of a broader research project on the promotion of architectural accessibility in counties, for the inclusion of people with limited mobility, whose results are already published. ⁽⁹⁾

METHOD

This is a descriptive, exploratory study, using the quantitative paradigm.

The nurses are the study population. The sampling technique was non-probabilistic accidental snowball, and the sample consisted of 56 nurses. Inclusion criteria: nurses who access social networks (facebook) and email, and data collection was carried out through an ad hoc self-administered questionnaire using the Google form, in the period of November 2016. The construction of the questionnaire was carried out from the current legislation by the time.

Variables considered: sociodemographic characteristics; knowledge about legislation with three dimensions: the legislation itself, the process of activating the means, the beginning of the process; knowledge of the international accessibility symbol (yes and no); interventions in daily practice; architectural barriers existing in the nurses' area of residence.

Data were processed using the IBM SPSS software program, version 20.0, and descriptive statistics were used by calculating absolute (N), relative (%) frequencies; measures of central tendency (mean and median), measures of dispersion (minimum, maximum and standard deviation) and non-parametric tests. For data analysis, a value of $p < 0.05$ was adopted - statistically significant. ⁽¹⁰⁾

Throughout the research, the required ethical standards were complied with, and the study was approved by the Ethics Committee of the Nursing School of Porto (Opinion n° 11/2017). Informed consent was obtained online using the GOOGLE form, when responding to the questionnaire.

RESULTS

The sample consists of 5 male participants (8.9%) and 51 female participants (91.1%) which are on average 32 years-old, with a minimum and maximum limit of 22 and 63 respectively, and one standard deviation of 7.9 years.

With regard to years of professional practice, on average they have been working for 8.9 years, corresponding to a mode of 8 years and a standard deviation of 7.869; with a minimum of less than a year and a maximum of 37.

As for training, 44.6% have a degree, 21.4% have a specialty in rehabilitation nursing, 10.7% have another specialty, 3.6% have a master's degree in rehabilitation nursing, 16.1% have another master's and 3.6% have a PhD. Most of them work at the hospital level (76.8%), 17.9% in other places (such as homes, day care centers, schools) and 5.4% in the community.

According to the normality test (Kolmogorov-Smirnov test) we verified that the sample distribution is not normal, in terms of age or length of professional practice (p=0).

We found that 31 nurses (55.4%) have knowledge about specific legislation for accessibility to buildings and establishments that receive public, public roads and residential buildings and 25 do not (44.6%).

Regarding the process of activating means responsible for the elimination of existing architectural barriers for people with limited mobility in the community, 23

nurses (41.8%) say they know, and 32 (58.2%) do not know about the process. In case they need to request some intervention to eliminate architectural barriers for people with disabilities in the community, 22 nurses (39.3%) know who to turn to, but 34(60.7%) do not know

More than half of nurses (58.9%) in their daily practice do not develop any type of intervention to eliminate architectural barriers for people with disabilities, but 41.1% say they intervene in this area.

As for the international symbol of accessibility, 83.6% know it and 16.4% of the nurses do not know it.

From the analysis of the nurses' view of the architectural barriers existing in the environment surrounding their area of residence, we found, as shown in table 1, that sometimes sidewalks and other pedestrian paths, such as ramps and stairs, comply with the provisions of legislation (87.5 %); sports facilities have at least one accessible route for people in wheelchairs (57.1%) and an adapted shower cabin (58.9%); public pools have at least one access to water via a ramp/mechanical means (53.7%); public buildings have at least one accessible route inside (48.2%) and adapted sanitary facilities in public places such as coffee shops, schools, supermarkets, health center (69.6%).

It should be noted that regarding parking spaces for people with reduced mobility, 50% of nurses report they often exist and 25% state that they always exist. As for walks and other walking routes, nurses never mentioned always complying with the legislation.

Dimensions	Never		Sometimes		Usually		Always		Total	
	N	%	N	%	N	%	N	%	N	%
Tours and other walking routes comply with the legislation	3	5.4	49	87.5	4	7.1	0	0.0	56	100
Sports facilities have at least one wheelchair accessible route	3	5.4	32	57.1	19	33.9	2	3.6	56	100
Sports facilities have at least one adapted shower cabin	10	17.9	33	58.9	10	17.9	3	5.4	56	100
Public swimming pools have at least one access to water by ramp/mechanical means	16	29.6	29	53.7	6	11.1	3	5.6	54*	96,4
Public buildings have at least one accessible route to access their interior	4	7.1	27	48.2	19	33.9	6	10.7	56	100
Parking spaces for people with reduced mobility	0	0.0	14	25	28	50	14	25	56	100
Adapted sanitary facilities (coffee shops, schools, supermarkets, health center)	1	1.8	39	69.6	15	26.8	1	1.8	56	100

*In this question there was a 'missing'

Table 1 - Opinion on the most frequent architectural barriers in accessing public places / public road, in the area of residence

There were no statistically significant differences regarding knowledge of the activation process of the means responsible for the elimination of existing architectural barriers for people with limited mobility in the community (p=0.281); specific legislation for accessibility to public buildings and establishments, public roads and residential buildings through Ordinance n°163/2006 (p=0.504); they know who to turn to if they need to request intervention to eliminate some type of architectural barrier for people with disabilities in the community (p=0.142) and; in the exercise of its daily practice, it develops some type of intervention in order to eliminate architectural barriers for people with limited mobility,

promoting mobility, accessibility and participation (p=0.229).

However, there are significant statistical differences, with p = 0.000, in the knowledge of the international symbol of accessibility; in compliance with legal provisions on sidewalks and other pedestrian routes; the sports facilities have at least one wheelchair accessible route, and have at least one adapted shower cabin; in public swimming pool facilities there is at least one access to water by ramp or mechanical means; in Public Administration buildings there is at least one accessible route to access its interior; in social zones; in public services (coffee shops, restaurants, schools, supermarkets, health centers,

among others) there are sanitary facilities for people with reduced mobility; and with $p=0.030$ in public parks there are parking spaces for people with reduced mobility.

After analyzing the data in the overall sample, two groups were formed, nurses with a specialty in rehabilitation nursing and nurses without a specialty in rehabilitation nursing. Thus, 40 nurses do not have a specialty in rehabilitation nursing (71.4%) and 16 (28.6%) do. Nurses with a specialty have an average of 33.69 years of age, with a standard deviation of 9.17 years, and have been working for an average of 10.64 years, with a standard deviation of 9.54 years.

On the other hand, nurses without a specialty in rehabilitation nursing have an average of 31.48 years, a standard deviation of 7.44 years and have been working for an average of 8.37 years with a standard deviation of 7.22 years.

There is no association between having or not having a specialty in rehabilitation nursing and gender ($p=1$). There is a perfect association between professional training and being or not a rehabilitation nurse ($p=0.000$).

There is no association between the workplace and being or not a rehabilitation nurse ($p=0.974$).

There is a perfect association between being a rehabilitation nurse and having knowledge about specific legislation for accessibility to buildings and establishments that receive public, public roads and residential buildings through Ordinance No. 163/2006 ($p=0.000$).

There is an association between being a rehabilitation nurse and knowing who to turn to if you need to request intervention to eliminate some type of architectural barrier for people with limited mobility in the community ($p=0.024$) and knowledge of the activation process of the means responsible for eliminate existing architectural barriers for people with disabilities in the community ($p=0.04$).

There is no association between being a rehabilitation nurse and in the exercise of daily practice developing some type of intervention to eliminate architectural barriers for people with disabilities, promoting mobility, accessibility and participation ($p=0.390$). There is no association between being a rehabilitation nurse and knowing the international symbol of accessibility ($p=0.710$).

There are no statistically significant differences between the two groups regarding the existence of architectural barriers in the area of residence of these nurses, highlighting: sidewalks, ramps and stairs comply with legislation ($p=0.516$); sports facilities have a wheelchair accessible route ($p=0.375$); have an adapted shower cabin ($p=0.275$); in public pools there is access to water via a ramp/mechanical means ($p=0.213$); Public Administration buildings have an accessible route to the interior ($p=0.775$); in public places there are parking spaces for people with reduced mobility ($p=1$); in public services there are adapted sanitary facilities ($p=0.317$).

DISCUSSION

We wonder how nurses stand on the promotion of architectural accessibility, given that, in reality, more than half of the participants in our study (55.4%) declare that they have knowledge about the specific legislation for accessibility to buildings and establishments that receive the public. , public roads and housing buildings through Ordinance nº163/2006, of 8 August, but 44.6% of nurses do not know, despite the fact that, in our country, the legal framework of accessibility and mobility for all refers us to the year of 1997.

Currently, Ordinance No. 163/2006 of 8 August is in force, designated as Accessibility regime for buildings and establishments that receive public, public roads and residential buildings⁽¹¹⁾. This advises the use of the international accessibility symbol, in a place that is easily seen, read and understood by anyone standing or sitting, so that they can be guided and directed towards accessible entrances/exits and routes, as well as identifying reserved parking spaces for people with reduced mobility and accessible toilet facilities.

Of the respondents, 83.6% know this symbol, however, although the legislation suggests this symbol, its use is still not widespread; since in a study carried out in 27 schools in the municipality of Chapecó, in which they assessed the external and internal environment of schools in terms of accessibility conditions, they reported that no school had the presence of this symbol.⁽¹²⁾

Local councils are the government body that is closer to the people and which they can use to eliminate some architectural barriers; therefore, they have a strong focus on promoting an accessible and barrier-free environment for all.⁽¹³⁾

In a study carried out in three counties in the center region of Portugal, in which they carried out a documentary survey of the municipal management programs in these counties, they found a housing program that aims to improve the conditions of architectural accessibility, for example, through the construction of small houses interior repairs.⁽⁵⁾ In the same study, they also found that in some counties there are programs to intervene in the environment and in green spaces, which include measures to adapt the spaces for people with limited mobility.

When asked if they know or know the process of activating the means responsible for the elimination of existing architectural barriers for people with limited mobility in the community, 41.8% of nurses know, but more than half (58.2%) do not. In the development of their professional practice, if you need to request intervention to eliminate some type of architectural barrier for persons with disabilities in the community, 60.7% of nurses do not know who to turn to.

From this we can understand that there is no articulation between the health sector and local authorities in this matter, despite some Councils having an Provider for Persons with Disabilities, Health Promotion Offices or Active Aging Programs.⁽⁵⁾

The United Nations Report on the right to housing and life in cities for people with disabilities emphasizes that local authorities are extremely important in the development of plans that guarantee access without architectural barriers to public spaces and services in order to promote life independent. ⁽¹⁴⁾

In order to understand whether nurses develop actions aimed at promoting accessible environments, we verified that, of the total sample and, in their daily practice, more than half (58.9%) do not perform any intervention in the scope of the elimination of architectural barriers in the community, despite *“acting as a resource for individuals, families and communities facing challenges posed by health, disability and death”*. ⁽¹⁵⁾

One of our goals was to analyze the differences between nurses with and without a specialty in rehabilitation nursing on architectural accessibility, so we wonder if there are differences between rehabilitation nurses and other nurses on accessibility.

According to the skills of the rehabilitation nurse ⁽⁷⁾, it is their responsibility to work for the inclusion of people with limited mobility, showing that despite the functional limitations, their integration and participation in different contexts (work, leisure...) is possible. This fact is corroborated by our study, which confirms an association between being a rehabilitation nurse and having knowledge about specific legislation for accessibility, knowing whom to turn to if needed to request intervention to eliminate some type of architectural barrier in the community, and knowledge the process of activating the means responsible for its elimination.

As one of the skills of rehabilitation nurses is to identify and guide the elimination of architectural barriers in different contexts of the person, it was expected that, in the exercise of daily practice, they would develop some type of intervention in this regard, promoting mobility, accessibility and participation. However, no statistically significant differences were found.

Regarding the existing architectural barriers in the nurses' residence area, we found statistically significant differences in the buildings of Public Administration, in which only sometimes have at least one accessible route to access its interior; in social zones. The 2011 Census, state that *“the majority of buildings were not accessible to people with reduced mobility”* and that around 59% of the buildings had no accessible entrance for people with reduced mobility ⁽¹⁶⁾.

Also the sidewalks and other pedestrian routes, such as ramps and stairs, only sometimes comply with the legal provisions, with a statistically significant relationship, and on the public road sidewalks are of great importance for people with reduced mobility and become serious barriers to the free and safe movement of people due to its inadequate dimensions or in some cases due to its absence, as well as, due to its state of conservation, bumps on the floor and the existence of plant elements, urban furniture and the inclination of the ramps that, sometimes, are so steep

that have to rely on the help of others to overcome the gaps. ^(11, 17)

In the reality of the participants, there are significant statistical differences as to whether sports facilities have or not have at least one accessible route for a wheelchair, and at least one adapted shower cabin; and in public swimming pool facilities there is at least one access to water by ramp or mechanical means.

We know that the regular practice of physical activity, in people with physical disabilities, shows positive results in their perception of quality of life⁽¹⁸⁾. However, in a study that evaluated the main barriers and the main perceived facilitators for the practice of physical activity by people with physical disabilities, regarding indicators related to the environment and architectural accessibility, they did not find statistically significant differences; that is, these factors do not interfere positively with the practice of physical activity. ⁽¹⁹⁾

Perestrelo ⁽²⁰⁾ assumes it is essential to mobilize in favor of the other, developing a democratic and participatory culture, which is why we consider important the existence of a commitment on the part of health professionals, namely rehabilitation nurses, in the elimination of architectural barriers through requests and proposals for improving accessibility conditions. Since there is a weak involvement of these professionals in promoting accessible environments, particularly in their area of residence, as there are no statistically significant differences between having and not having a specialty in rehabilitation nursing.

In short, and given the initial question, we can say that rehabilitation nurses have increased knowledge compared to other nurses about the elimination of architectural barriers. However, to reinforce people's gains in architectural accessibility, it is essential to create synergies, through the identification and mobilization of networks of local actors (economic, political, social, associative, among others), valuing community networks and other informal networks. ⁽²¹⁾

Rehabilitation nurses must expand efforts between the various partners, bring people's decisions closer and meet their needs, according to the contexts in which they develop their professional practice, looking for creative solutions to particular problems, such as the elimination of architectural barriers on public roads and public places, but also in their homes. We recognize that the built environment often needs to be rethought in view of its use by people with reduced mobility.

CONCLUSION

Nursing is a scientific discipline that usually has as its central point the provision of care to the person; however, the target of nursing care is also the family, a group, a community or society.

By the application of Ordinance No. 163/2006, it was expected that in February 2017 there would be no architectural barriers in places of public use as the deadline for adapting the spaces (buildings, establishments and equipment for public use whose

construction date was earlier expired) to 1997). However, our results demonstrate that architectural barriers still exist in nurses' areas of residence.

With this study, we understand that accessibility and the elimination of architectural barriers are not a concern in the provision of care by nurses, since there were no statistically significant differences regarding the knowledge of the process of activating the means responsible for the elimination of architectural barriers; specific legislation for accessibility; if know who to turn to if need to request intervention to eliminate some type of architectural barrier and whether in the exercise of daily practice develop some type of intervention in order to eliminate architectural barriers.

There are differences between nurses with and without a specialty in rehabilitation nursing, namely in the knowledge of specific legislation for accessibility, knowing who to turn to if you need to request intervention to eliminate some type of architectural barrier for persons with limited mobility in the community and knowledge of the process of activating the means responsible for eliminating architectural barriers. But, there are no differences regarding the development of some type of intervention in order to eliminate architectural barriers in your professional practice.

The results showed a need for nurses to develop practices that promote integration and civic participation by promoting accessibility conditions.

Given the skills of rehabilitation nurses, their importance in promoting accessible environments is unquestionable. However, they must take ownership of these skills and their increased responsibility as a citizen, getting involved in the improvement of accessibility conditions. We believe that it is important for the gains in quality of life of people with disabilities that rehabilitation nurses have a more proactive attitude in this area.

Rehabilitation nurses and local municipal bodies can be a binomial of health promotion and architectural accessibility, since they are the political actors in the construction of inclusive territories, by complying with legal provisions, building inclusive cities for persons with limited mobility.

The progressive elimination of architectural barriers is essential for people with limited mobility to have access to all systems and services in the community and to enjoy their rights as citizens.

The limitation of the study is related to the sample size, which is not representative of the universe of nurses.

We consider it important to develop other studies that assess the difficulties that nurses face in their daily practice when they want to eliminate architectural barriers, as more than half recognize that they do not develop any type of intervention to eliminate architectural barriers and understand how it can be enhanced its action in promoting accessible environments.

We believe that it is essential to carry out a study on the implementation of the measure proposed by the National Plan for the Promotion of Accessibility regarding the training of new professionals and the inclusion in the study plan of training modules on the theme of accessibility, as well as rethinking the creation of a network necessary to guarantee the conditions of accessibility for people with disabilities.

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EVIDÊNCIAS SOBRE APLICAÇÃO DAS BANDAS NEUROMUSCULARES NA REABILITAÇÃO DO PÉ NOS DOENTES PÓS ACIDENTE VASCULAR CEREBRAL

EVIDENCE ON THE APPLICATION OF NEUROMUSCULAR BANDS IN THE REHABILITATION OF THE FOOT IN POST-STROKE PATIENTS

EVIDENCIAS SOBRE APLICACIÓN DE BANDAS NEUROMUSCULARES EN LA REHABILITACIÓN DEL PIE EN PACIENTES DESPUÉS DE UN ACCIDENTE VASCULAR CEREBRAL

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Raquel Silva¹; Ana Campos¹; Eliseu Almeida²; Helena Santos³; Sandra Fernandes⁴

1 - Centro Hospitalar São João; 2 - ARS Norte; 3 - Centro Hospitalar Vila Nova de Gaia/ Espinho; 4 - Centro Hospitalar do Porto

RESUMO

Objetivo: Determinar os benefícios da aplicação das bandas neuromusculares na reabilitação do pé nos doentes pós acidente vascular cerebral.

Metodologia: Estudo de revisão sistemática da literatura segundo o modelo de *Joanna Briggs Institute*. Incluíram-se estudos em adultos pós acidente vascular cerebral aos quais foram aplicadas bandas neuromusculares. Cinco revisores independentes realizaram a avaliação crítica, extração e síntese dos dados.

Apresentação e interpretação dos resultados: Os 4 estudos incluídos reportaram melhorias na postura corporal, deambulação e percepção sensorial.

Conclusão: Os estudos analisados sugerem que as bandas neuromusculares podem ser um método promissor a ser utilizado como método complementar no tratamento do pé do doente pós acidente vascular cerebral, sendo que são necessários mais estudos neste âmbito.

Palavras-chave: acidente vascular cerebral, bandas neuromusculares, Kinesio Taping, pé, reabilitação

RESUMEN

Objetivo: Determinar los beneficios de la aplicación de bandas neuromusculares en la rehabilitación del pie en pacientes después de un accidente vascular cerebral.

Metodología: Estudio de revisión sistemática de la literatura según el modelo de *Joanna Briggs Institute*. Se incluyeron estudios en adultos post accidente cerebrovascular a los que se aplicaron bandas neuromusculares. Cinco revisores independientes realizaron la evaluación crítica, extracción y síntesis de los datos.

Presentación e interpretación de los resultados: Los 4 estudios incluidos reportaron mejoras en la postura corporal, deambulación y percepción sensorial.

Conclusión: Los estudios analizados sugieren que las bandas neuromusculares pueden ser un método prometedor que se utilizará como método complementario en el tratamiento del pie del paciente post accidente cerebrovascular, y se necesitan más estudios en este ámbito.

Palabras clave: accidente cerebrovascular, bandas neuromusculares, Kinesio Taping, pie, rehabilitación

ABSTRACT

Objective: To determine the benefits of the application of neuromuscular bands in the rehabilitation of the foot in post-stroke patients.

Methodology: A systematic review of the literature according to the model of *Joanna Briggs Institute*. Studies have been included in adults after stroke to which neuromuscular bands have been applied. Five independent reviewers performed the critical evaluation, extraction and synthesis of the data.

Presentation and interpretation of results: The 4 included studies reported improvements in body posture, ambulation and sensory perception.

Conclusion: The studies analyzed suggest that neuromuscular bands may be a promising method to be used as a complementary method in the treatment of the patient's foot post stroke, and further studies are needed in this area.

Key words: stroke, athletic tape, Kinesio Taping, foot, rehabilitation

INTRODUCTION

Stroke is defined as an interruption of the blood supply to the brain, usually due to the rupture of a blood vessel or its obstruction due to the presence of a clot⁽¹⁾. As a consequence, neurological damage occurs, such as deficits in motor, sensory, behavioral and perceptual functions.

For the systematic literature review (SLR) that we carried out, it is important to reflect specifically on the changes in motor and sensory function after stroke. Thus, the change in tone, namely spasticity (abnormal posture and stereotyped movement of a limb), requires our attention due to the risk of developing equine foot, which has an impact on mobility (gait) and on the person's balance. Likewise, the postural control mechanism can be affected in the individual who has had a stroke. Their daily life is changed as the change in postural control affects basic tasks such as rolling, sitting, standing and walking. In turn, the decrease in proprioceptive sensitivity (postural and vibratory) contributes to the loss of the ability to perform efficient and controlled movements, to the decrease in sensation and sense of position and movement, preventing and reducing new motor learning in the affected hemibody⁽²⁾. Given the motor complications that the individual is subject to after stroke, it is very important to act to prevent the loss of functional capacity associated with neurological deficits related to motor, sensory and postural functions.

Given the above, the Rehabilitation Nurse (RN) supports the decision-making in a documented manner, focusing on the quality and results of specialized care in rehabilitation nursing. According to the Regulation of Specific Competencies of the Specialist Nurse in Rehabilitation Nursing, the intervention area is directed towards the maintenance and promotion of well-being and quality of life, the recovery of functionality, maximization of capacities and prevention of complications, directed to the person throughout their life cycle⁽³⁾.

In the process of foot rehabilitation in post-stroke patients, there are several rehabilitation techniques available, and in recent years the applicability of athletic tape (AT) or Kinesio tape (KT) has gained more followers and popularity, having been developed each time more studies about its usefulness in this process.

Kinesio Taping is a technique that involves the application of a therapeutic elastic band on the skin, and was developed in the 1970s by the Japanese chiropractor Kenzo Kase, with the objective of providing the patient with a therapeutic resource that

would help the muscle and other tissues to achieve their homeostasis in the interval between chiropractic sessions. Some authors report that the technique is based on the induction of adequate sensory stimuli on the skin, through the application of an elastic band, which can be used to enhance and facilitate tissue and body homeostasis in any human condition⁽⁴⁾. Having been developed to facilitate the body's natural healing process, while providing support and stability to muscles and joints without restricting the body's range of motion; it has been used to treat a variety of orthopedic, neuromuscular, neurological and medical conditions.

Athletic tapes can act on muscle, joints, lymphatic circulation, fascia, dermis, tendons and ligaments. Thus, the benefits advocated by neuromuscular bands can be subdivided into four major functions: dermal function, muscle function, joint function and lymphatic function. However, according to the technical manual, it is possible to stimulate or inhibit a certain muscle, using neuromuscular bands. The application of the neuromuscular band made in the direction of insertion to the origin of the muscle (from distal to proximal) would have an inhibitory effect and, when the direction of application of the neuromuscular band is from the origin to the insertion of the muscle (from proximal to distal); it would have muscle facilitation or stimulation effect⁽⁴⁾.

According to Kenzo Kase (2003), this therapy aims to: relieve pain and abnormal sensations in the skin and muscles; to provide greater balance and support to the muscles during movements; to decrease lymphatic and blood edemas; to correct joint and biomechanical misalignments; to create more space at the epidermal, dermal and hypodermic levels; promote stimuli and improve proprioception⁽⁵⁾.

Despite the application of neuromuscular bands in the field of neurology, be an increasingly reality, as mentioned above, the truth is that to date few studies have been carried out to validate their use in this population. The therapeutic effects advocated by the application of neuromuscular bands remain controversial and there is no scientific evidence to support them. Thus, having gained importance in recent years in its application in the field of neurology, it is interesting to clarify and validate this technique in the rehabilitation process of post-stroke patients at foot level. Like so, to find out what is the evidence on the application of neuromuscular bands in foot rehabilitation in post-stroke patients' muscle⁽⁴⁾.

METHOD

The Systematic Review followed the guidelines of the Joanna Briggs Institute (JBI). Selection criteria were defined and applied according to the PEO methodology that defines, according to Mendes *et al* (2008), the Population, the Exposure and the results, from the english Outcome⁽¹⁴⁾. Participants: all adults diagnosed with stroke; Exposure: application of neuromuscular

bands on the foot; Outcomes: rehabilitation. Only randomized clinical trials were selected.

During the month of July 2018, the search was carried out in the subsequent electronic scientific databases: Medline® and CINAHL®, defining as inclusion criteria the studies published in Portuguese, English and Spanish, with open access text and date from 2012 to 2018 and aged 19 years-old or over (all adults).

Research strategy and identification of studies

Initially, a limited search was carried out in the Medline® and CINAHL® database using the Boolean phrases, ((MH "Stroke+") AND ((MM "Athletic tape") OR ("kinesio tap*")) AND (MM "Foot") AND (MH "Rehabilitation+")) and ((MH "Stroke+") AND ((MH "Tapes+") OR (MM "Athletic Tape") OR ("kinesio tap*")) AND (MH "Foot+") AND (MM "Rehabilitation")), respectively. Due to the existence of differences in the indexing processes in the bibliographic databases, it was chosen, in addition to the use of controlled vocabulary (descriptors), to use the free term "Kinesio Taping" in the research. With this strategy, there was a recovery of a greater number of references, ensuring the identification of most of the works published within the pre-established criteria.

A selection followed by reading the titles and abstracts. The selection of articles was performed individually by 3 reviewers (AC, EA and RS) with a consensus of 2 reviewers (HS and SF).

Assessment of the methodological quality of studies

Methodological quality was assessed by 3 independent reviewers (AC, EA and RS) with consensus from 2 other reviewers (HS and SF) using the JBI Critical Appraisal Checklist for Randomized Controlled Trials assessment tool ⁽⁶⁾, in which quality studies were considered those with a maximum of 3 negative responses (defined in a consensus prior to the investigators' analysis, in order to preserve a score equal to or greater than 75% of positive responses). To classify the level of evidence of studies, the Hockenberry levels of evidence were used, and the studies were classified with level of evidence Ib (which corresponds to evidence obtained from at least one clinical trial) ⁽⁷⁾.

Data extraction

Data were extracted by 3 reviewers (AC, EA, RS) and with the consensus of 2 other reviewers (HS and SF), independently, between July and August 2018, using the instrument of Joanna Briggs Institute data extraction form for systematic review of experimental/observational studies and included the characteristics of the participants, the characteristics of the intervention, the study methods and the relevant results of the evaluated outcomes.

Data synthesis

Data synthesis was carried out in July and August 2018, with the aim of summarizing the data narrative. 3 reviewers participated in it (AC, EA, RS), with the consensus of 2 other reviewers (HS and SF). For this purpose, a table was created for each of the studies included in the systematic review, which included: title, author, country, year, type of study, population, method, objectives, results and conclusions.

Presentation of results

1,219 articles were identified: 911 from CINAHL® Plus with Full Text (ESBCO® - host via ESSM) and 308 from MEDLINE® with Full Text (ESBCO® - host via ESSM). Of these, 850 were excluded by the search limiters, leaving 235 articles from CINAHL® and 134 from MEDLINE®. With the support of Endnote®, and after compilation of the articles mentioned above, there were 33 duplicated articles. Of these, 330 were excluded by title, as they focused on anatomical sites other than the one outlined for this review; and one was excluded after reading the abstract. The 5 selected studies were methodologically evaluated, after applying the JBI Checklist for Randomized Controlled Trials, and 4 studies were considered valid since the percentage of true responses was greater than 75% (as previously recommended) and 1 excluded for not checking the methodological validity established by the researchers. After this individual selection, and in order to increase the reliability and transparency of the selection process, all researchers met, and there was unanimity in the selection of studies.

Out of the 4 articles included, 3 are written in English and 1 in Portuguese, dated 2015 and 2017. One study was published in Turkey, one in Brazil, one in the Republic of Korea and one in Iran. All studies respect the ethical criteria regarding the investigation process carried out. Regarding the types of studies, the 4 are quantitative.

Table 1 shows the studies that composed this Systematic Review, and it includes: the authors of the studies, the year of publication, the country, the characteristics of the participants, the interventions and the results of the included studies, as well as the level of evidence (LE) of each study and methodological evaluation (ME).

RESULTS AND DISCUSSION

In the particular analysis of the selected studies, there was a great heterogeneity of them, regarding the objectives, the method, the type of sample and the way they study the action of neuromuscular bands when applied to the foot in post-stroke patients.

From the analysis of the results of the studies included in this SLR, we can infer that the application of neuromuscular bands had positive effects in terms of balance, foot motor control, perception, ankle amplitude and gait.

In study 1, the authors reveal that after implementing the therapeutic plan that consisted of applying athletic tapes on foot, there is an improvement in

perception, with consequences in improving the balance of individuals in the group ⁽⁸⁾.

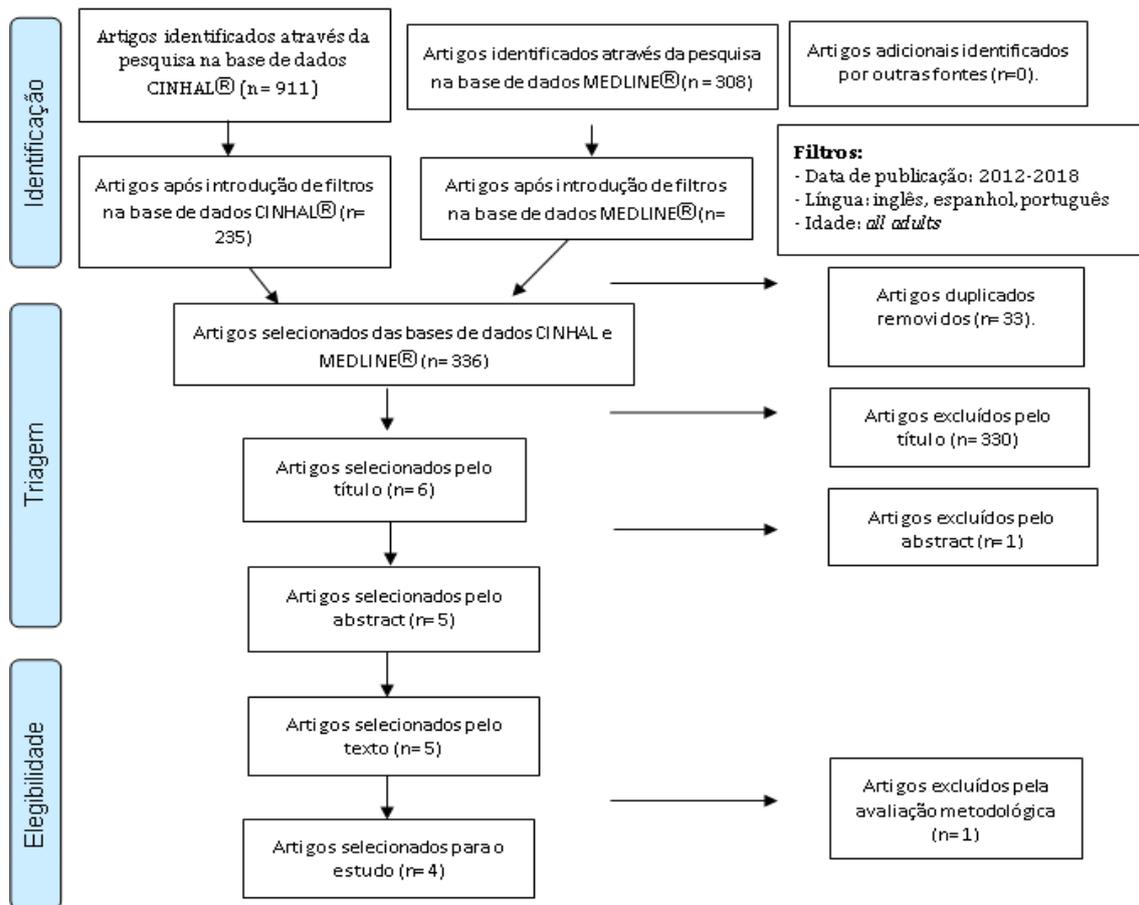


Figure 1 - Selection process diagram

Article (n.º), Author, Year (Country)	Type of Study/Population	Interventions	Results/Outcome	E.L	M.E.
1, Yazici, Guclu-Gunduz, Bayraktar, Aksoy, Nazliel, Kilinc, Yildirim, Irkec, 2015 (Turquia) ⁽⁸⁾	Randomized clinical trial	Experimental: 19 persons with stroke Control: 16 healthy persons without neurological disorders.	Improvements in the balance of individuals in the experimental group, which is associated with increased somatosensory perception due to the presence of athletic tape in the foot.	lb	10/13
2, Lima, Wanderley, Henriques, Filho, Oliveira, 2017 (Brasil) ⁽⁹⁾	Randomized, double-blind clinical trial	Experimental: 7 persons with stroke to whom neuromuscular tension bands were applied Control: 7 persons with stroke to whom tension-free neuromuscular bands were applied.	The hypothesis that the application of athletic tapes with tension was effective in the gain of ankle joint range was not proven. However, 3 persons in the control group said they felt a positive difference when using the athletic tapes in terms of gait and 2 persons reported a positive difference in terms of perception.	lb	12/13
3, Yang, Heo, Lee, 2015 (República da Coreia) ⁽¹⁰⁾	Randomized primary experimental study	Experimental: 19 persons with stroke to whom neuromuscular bands were applied and subsequently evaluated for postural balance and pressure distribution in the foot Control: 19 individuals with stroke underwent the same procedures as the experimental group but in reverse order.	There was a change in the center of balance after the application of neuromuscular bands.	lb	10/13
4, Rojhani-Shirazi, Amirian, Meftahi, 2015 / Irão ⁽¹¹⁾	Randomized controlled clinical trial.	Experimental: 20 persons with stroke to which athletic tapes were applied Control: 20 persons with stroke who were not applied athletic tapes.	Statistically significant improvement in balance and foothold in the experimental group compared to the control group.	lb	10/13

Table 1 – Summary of studies included in the SLR.

In the study carried out by Lima et al (study 2), the findings were not significant in terms of ankle amplitude gain. However, the authors report that study participants reported an improvement in gait, as well as in perception ⁽⁹⁾.

Regarding study 3, after the application of athletic tapes, the experimental group showed alterations in the center of balance ⁽¹⁰⁾.

Study 4 mentions a statistically significant improvement in terms of balance and foot motor control ⁽¹¹⁾.

Based on the data listed above, it is possible to verify that after placing the athletic tapes, the following gains are described: in balance (studies 1 and 4); in the change in the center of balance (study 3); in perception (studies 1 and 2); in foot control (study 4) and in gait (study 2). Although there is a relationship of gains after placement of athletic tapes in studies, its comparison is questionable due to the existing discrepancy in the design of the studies, in their methodology and sometimes hidden information, namely: type of stroke and respective area of injury; post-stroke recovery time, care prior to the application of athletic tapes, detailed neuromuscular band application method; exposure time; scales and method of evaluating results.

The studies selected for this Systematic Review were assigned grade C regarding the degree of recommendation according to the quality of scientific evidence, according to the Jovell and Navarro-Rubio scale⁽¹²⁾. Since there is insufficient scientific evidence, the decision to adopt the technology must be based on other criteria.

This Systematic Literature Review brings as main contribution to the practice of rehabilitation nurses the knowledge existing in the application of neuromuscular bands in the foot of the patient after a stroke. On the other hand, it guides for a more precise elaboration of new studies since it mentions the limitations found in the existing studies, as well as some suggestions.

CONCLUSIONS

Stroke has a great impact on a person's life cycle, as it acutely affects their health and quality of life. Nursing is a science that relates to transitional human experiences, in which health and well-being stand out as intervention outcomes; in this theoretical understanding, the challenge of the rehabilitation nurse professional centers on understanding the transition process, developing adaptive strategies that help the person to regain stability and well-being ⁽¹³⁾.

In this sense, it is up to the rehabilitation specialist nurse to implement rehabilitation programs based on

the best existing evidence, in order to obtain gains that translate in recovery/minimization of post-stroke patient deficits. When performing this SLR, we verified there are some benefits in the application of athletic tapes in foot rehabilitation in post-stroke patients, namely in terms of body posture, gait and sensory perception. Despite the limitations found, which include the small number of studies, the small sample size and the methodological differences that make it difficult to compare the results, there was no compromise in achieving the goals initially outlined.

Therefore, we believe that it would be beneficial to carry out more studies in this area, taking into account a greater number of participants, a longer follow-up, a more detailed and monitored description of the application of neuromuscular bands, as well as the realization of a program of rehabilitation in order to complement this technique.

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