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CONTENT INDEX

EDITORIAL

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At the end of the second year of the magazine's edition, it is important to leave some results of this experience, that each new issue is intended to be better and more focused on the objectives of this area of intervention.

We know that not all rehabilitation nurses have reflected on the importance of this means of dissemination for their work; it's not only in promoting good practices, but also in the development of knowledge in the area, hence some support for their self-training. On the other hand, we know that it is difficult to expose ourselves when we write, because we have to be humble when we start a publication proposal, because other people will have different views on what we consider the best.

We have been guided by an effort to find credibility for the journal, so we follow a blind review process and we already have ISSN since the first journal and DOI since the third issue, which makes the authors' production already accessible in other databases and as well with the possibility of greater referencing.

When we look at what has been published, we identify that we have 9.43% in an integrative review article; Systematic review article 20.75%; Original article 62.26%; Theoretical study 1.89% and Professional experience report 5.66%, which guarantees us a large growth margin considering that only 28.30% of the first authors have their affiliation in schools or universities and 71.70% are from health institutions and even though 88.7% have their origin in Portugal, the rest from other countries.

We want to be a contribution in a society of knowledge and information, to the consolidation of the role of the specialist nurse in rehabilitation, as a holder of differentiated increased skills, not only in the specific knowledge they hold, but also in their skills and attitude in professional practice.

We hope that each Specialist Rehabilitation Nurse will feel invited to share their knowledge and experience in this space to demonstrate that we have significant contributions to people in their processes of promotion, prevention and rehabilitation of health states of well-being and success in their lives.

DOCTOR PROF. MARIA MANUELA MARTINS

Coordinating Professor of the Nursing School. Member of the Research Group - NursID: Innovation and Development in Nursing - CINTESIS - Center for Health Technology and Services Research - FMUP. Professor at the Master degree course of Rehabilitation Nursing, Coordinator of the Master degree course of Management and Head of Nursing Services. Member of the Scientific Committee of the Doctorate in Nursing Sciences at UP.

Throughout the 4 issues of the Portuguese Journal of Rehabilitation Nursing, the quality of the scientific production produced is evident. In fact, it is only with consistent, solid and regular scientific production that the profession asserts itself.

Over time, among peers, some expressions practically gained the dimension of dogmas: that investigation is difficult, that investigating is a waste of time, or even that negative results can be obtained. Rehabilitation Nursing can only continue to assert itself through the knowledge produced, the evidence-based practice and the resolution of problems raised by concerns.

We know that much of this work has been produced as a result of work carried out in the context of obtaining an academic degree. Now, all Rehabilitation Nurses have an added responsibility: to develop research projects in the context of daily professional activity. Continuing to investigate is a demonstration of permanent dissatisfaction and the constant search for answers. For this, we have preferential conditions to continue to do so: we solve problems every day and use the scientific method several times during this decision-making process.

To facilitate this search for answers, it is important to systematize and target assessments and interventions. This systematization and objectification can include the presentation of examples of good practices, case reports, reflections on the interventions of the profession, simple drawings, practical situations that help to respond to everyday problems or, in a more elaborate way, by randomized clinical trials that help to validate a particular device or intervention. If the focus is on the method and not the result, the production of new knowledge in Rehabilitation Nursing will be a natural consequence.

Therefore, it will be crucial to continue to develop more studies in the specific competence areas of Rehabilitation Nursing.

ANDRÉ FILIPE MORAIS PINTO NOVO

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APLICAÇÃO DE UM PROGRAMA DE ESTIMULAÇÃO MULTISSENSORIAL A DOENTES COM ALTERAÇÕES SEVERAS DO ESTADO DE CONSCIÊNCIA

APLICACIÓN DE UN PROGRAMA DE ESTIMULACIÓN MULTISENSORIAL EN ENFERMOS CON ALTERACIONES SEVERAS DEL ESTADO DE CONCIENCIA

THE USE OF A MULTISENSORIAL STIMULATION PROGRAMME IN PATIENTS WITH SEVERE DISABILITIES IN THEIR COGNITIVE ABILITY

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RESUMO

Implementámos um Programa de Estimulação Multissensorial (PEM) a doentes com alterações severas do estado de consciência, integrado num projeto de melhoria contínua da qualidade dos cuidados de enfermagem: "Avaliação e estimulação do doente com alterações do estado de consciência" [(1)]. Tivemos como objetivo geral promover a melhoria do estado de consciência destes doentes.

Foi aplicado a 22 pessoas com média de idade de 57,95 anos (+17,27), sendo 63,64% homens. A tipologia de doentes foi maioritariamente AVC Hemorrágico (59,09%), seguida de Traumatismo Crânio-Encefálico (31,82%). Escolhemos a Escala de Coma de Glasgow (ECG) e a Rancho los Amigos Levels of Cognitive Functioning Scale (LCSF) para avaliar o doente.

Dos resultados destacamos: mais de metade dos doentes evoluíram no estado de consciência, 63,64% melhoraram o Score na ECG e 54, 55% progrediram no nível LCFS; os que tiveram a família envolvida evoluíram seis vezes mais em média na ECG.

Concluímos que com a aplicação do nosso PEM poderemos contribuir para a melhoria do estado de consciência da maioria destes doentes.

Descritores: Enfermagem de Reabilitação; Estado de Consciência; Reabilitação Cognitiva; Programa de Estimulação multissensorial; Alterações severas do estado de consciência.

RESUMEN

Se ha implementado un Programa de Estimulación Multisensorial (PEM) en enfermos con alteraciones severas del estado de conciencia, integrado en un proyecto de mejora continua de la calidad de los cuidados de enfermería: "Evaluación y estimulación del enfermo con alteraciones del estado de conciencia" [(1)]. Su objetivo general fue la promoción de mejoras en el estado de conciencia de los enfermos.

Fue aplicado a 22 personas con edad media de 57,95 años (+17,27), 63,64% de los cuales eran hombres. La tipologia de los enfermos fue mayoritariamente AVC Hemorragico (59,09%), seguida de Traumatismo Craneo-encefálico (31,82%). Se ha elegido la Escala de Coma de Glasgow (ECG) y la Escala Rancho los Amigos Levels of Cognitive Functioning Scale (LCSF) para evaluar los enfermos.

De los resultados destaca que más de la mitad de los enfermos han evolucionado en su estado de conciencia, 63,64% han mejorado su score según la ECG y 54,55% progresaron su nivel según la LCFS; aquellos enfermos cuya familia se ha involucrado en el proyecto han evolucionado seis veces más según la ECG, promedia.

Se concluye que, con la aplicación del PEM se puede contribuir a mejorar el estado de conciencia de la mayoría de dichos enfermos.

Palabras clave: Enfermería en Rehabilitación; Estado de Conciencia; Rehabilitación Cognitiva; Programa de Estimulación multisensorial; Alteraciones severas del estado de conciencia.

ABSTRACT

A multisensorial stimulation programme (MSP) was implemented in patients with severe changes in their state of councieousness, integrated in a project of continuous improvement of the quality of nursing care: "Evaluation and stimulation of patients with changes in the state of consciousness"(1). We aimed to promote the improvement of the state of consciousness of these patients.

This programme was applied to 22 people/participants with an average age of 57,95 years-old (+ 17,27), being 63,64% male patients. The majority of the patients included the ones affected by hemorrhagic stroke (59,09%), followed by traumatic brain injury (31,82%). The two chosen methods were: the Glasgow Coma Scale (GCS) as well as Rancho los Amigos Levels of Cognitive Functioning Scale (LCSF) to assess patients.

After the data analysis, the results were as follows: more than half of the patients showed a clear improvement in their cognitive awareness, 63,64% increased the GCS score and 54, 55 in the LCSF. The patients whose families were effectively involved in the programme improved in average, six times more in the GCS.

We have come to the conclusion that the introduction of our multisensorial programme led to an improvement in most of these patients.

Keywords: Rehabilitation Nursing; Cognitive Awareness; Cognitive Rehabilitation, Multisensorial Stimulation Programme, Major changes in cognitive abilities.

INTRODUCTION

Patients with severe brain injuries that in the past could not survive, nowadays, with all the existing technology at intensive care level, manage to resist, sometimes with serious consequences, namely in terms of the state of consciousness[2]. Patients in coma, vegetative state and minimal state of consciousness are included here (Table 1).

State of consciousness	Comportamental signals
Coma	It is not awake; absent or reflex motor activity.
Vegetative Status (VS)	Awake for periods, but with no visual fixation. Spontaneous reflex or behaviors, but without evidence of intentionality.
Minimum State of Conscience (MSC)	Start to be more alert. Visual fixation. Intentional, fluctuating but reproducible behavioral responses. According to the Aspen group, at least one of these behaviors: follow simple order; intelligible speech; purposeful behavior.

***Table 1**. Description of state of consciousness. Source: Adapted from Laureys S et al., [3]; Giacino JT et al., [4]; RCP [5]*

As rehabilitation nurses in a neurosurgery service, when faced with these patients, we asked ourselves of how to cognitively rehabilitate patients during the global rehabilitation nursing program.

There are few studies dedicated to the subject, some indicate that the key lies in multisensory stimulation[6].

Chipps *et al.*, mentioned by Hoeman[7] highlight the importance of stimulating the senses with known stimulus and refer as Rehabilitation Interventions in comatous patients, the introduction of controlled stimulus, including known strong odors and flavors (coffee, chocolate, salt, sugar); familiar sounds (voices of family members, favorite music); tactile stimulation with different textures and visual stimulation (colored cards).

For the neuroplasticity of the nervous system, sensory stimulation can contribute to the improvement of state of consciousness. Taylor[8], a neuroscientist who suffered from a stroke, states that "the brain has an extraordinary ability to modify its connections based on stimulus that come to it from the outside. This "plasticity" of the brain underlies its ability to regain lost functions". He also states: "neurons only develop when they are connected in a circuit with other neurons, isolated without stimulation, they wither away". Monteiro[9] summarizes that after neuronal injury or neural death, our brain looks for alternative axonal pathways that perform the same tasks, developing them. Royal Colleges of Physicians (RCP) in their Guidelines[5] refer that some authors have used Sensory Stimulation Programs to try to increase responsiveness, taking into account that the brain develops and adapts through the use and the response to external stimulus.

The general aiming of our project was to promote the state of consciousness improvement on patients with severe state of consciousness changes, the first step towards their Cognitive Rehabilitation, through the application of a systematized Multisensory Stimulation Program, as it can reduce the duration of the coma, avoiding sensory deprivation.

METHOD

Taking into account the bibliography and the clinical practice, in 2015, in the Neurosurgery Service of the Hospital Garcia de Orta, a project for the continuous improvement of the quality of nursing care - Assessment and stimulation of the patient with changes in the state of consciousness[1]. The above project received the 1st prize in the Nursing Care Quality Standards competition from the Southern Regional Section of the Ordem dos Enfermeiros (Order of Nurses), which provided us with the acquisition of material to implement the program (Figure 1).

***Figure 1**- Multisensory stimulation material for MSP.*

The general objective was to promote the improvement of the patient's state of consciousness, through the application of a systematized Multisensory Stimulation Program. Following our project, we elaborated the MSP (Table 2)[10]. The Glasgow Coma

Scale was selected to assess the level of consciousness and also the first three levels of the LCSF (Table 3), in order to measure cognitive evolution. LCSF was developed and is mainly used in patients with traumatic brain injury (TBI). It features eight levels of progression of cognitive functioning, from no response to appropriate behavior. According to our clinical practice, they reflect the evolution that these patients go through. In our study, we used the first three levels as they correspond to severe changes in the state of consciousness. It has an easy and quick application with objectives for each level (Table 4) and also specific indications for stimulation, particularly useful for the family. We researched other scales, including the Coma Recovery Scale – Revised (CRS-R), which is very complete, but time-consuming to apply in the work context.

This resulted in a Regulation for the application of the MSP. The inclusion criteria were patients admitted to the Neurosurgery Service of Hospital Garcia de Orta, with a Glasgow Score (GS) less than 10, hemodynamic stability and intracranial pressure less than 15 mmHg in the last 24 hours. Exceptions: brain dead patients and those with sedation.

Sensory regulation of stimulus
Maintenance of a calm, peaceful and comfortable environment; organized (one at a time) and slow stimulation of the senses, with rest at the end; 15 to 45 min maximum.
Multisensory Stimulation
Auditory: normal tone of voice (do not infantilize); use the usual name; introduce yourself; orientate to space and time; give response time even if you don't yet; explain what you do; ambient music and/or headphones at the end (know the patient's taste)
Smell: Pass along the nostrils known aroma for approximately 1 minute (personal perfume, coffee, lemon, pine, eucalyptus, vanilla, lavender…)
Taste: Place drops of a pleasant known flavor on the tongue (coffee, sweet...)
Visual: Show significant objects, if eye opening (photos of family/friends, children's drawings, TV, magazines with images, videos, optical fibers of various colors)
Tactile and Proprioceptive: Passive muscle-articular mobilization with verbal stimulation for movement; massage; touch with different textures; bath in the bathtub stretcher.
Vestibular: Balance training sitting on the edge of the bed, if allowed to stand up.
Involvement of family member/significant person
To explain that the person needs stimulus from the 5 senses, known and pleasing: images/videos/music from the cell phone; holding hands, applying cream, massaging, combing…
Ask them to speak in a normal voice (not enfatilize). Reinforce that alternating periods of stimulation (not to exceed 45 minutes) with rest periods.

***Table 2** - PEM Main Items for Specialist Rehabilitation Nurses Source: The authors*

Level		Behavior
I	No answer	Absence of patient response to any stimulus
II	General answer	Inconsistent, inappropriate, non-stimulation-specific reaction (chewing, sweating, blood pressure increase, polypnea, moaning, movements)
III	Local answer	More awake during the day and more movements. Specific but inconsistent response to stimulus (turns to a sound, runs away from pain, tries to observe someone moving in the room, starts to recognize family and friends, follows some simple instructions).

***Table 3** - LCFS (Níveis I, II, III.) Source: Adapted from Hoeman S.,[11]; Simões J., [12]; Rancho los Amigos[13]*

Level	Behavior	Objectives
I	No answer	Raise conciousness; Activate response and decrease agitation.
II	General answer	
III	Local answer	
IV	Confused - agitated	
V	Confused-unreasonable	Activate an intentional and appropriate response.
VI	Confused-appropriate	
VII	Automatic-appropriate	Increase the ability to perform activities of daily living with little or no direct supervision.
VIII	Purposeful-appropriate	

***Table 4** – LCFS and objectives for levels. Source: Adapted from Hoeman S, [7]; Simões J, [12]*

RESULTS

From March 2016 to September 2018, the Multisensory Stimulation Programme(MSP) was applied to 22 patients (Table 5) who met the criteria described. Most were men, with a mean age of 57.95, between 21 and 84 years old. Most had a diagnosis of hemorrhagic stroke (59.09%), followed by TBI (31.82%) of which most were polytraumatized. Patients who underwent initial surgical treatment only started PEM after this.

Most started MSP in Intensive Care (6 patients) or Intermediate (9 patients) and the rest in wards(7 patients), as soon as they had met the inclusion criteria already described in the methodology.

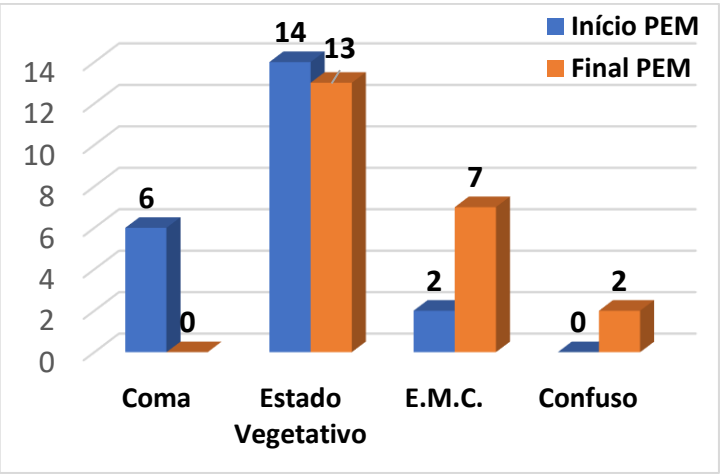
Variables		N	%	Average	Standard deviation
Sex	Female	8	36.36		
	Male	14	63.64		
Age				57.95	17.27
diagnostics	Hemorrhagic stroke	13	59.09		
	TBI	7	31.82		
	Brain tumour	1	4.55		
	ischemia bi-hemispheric after spine surgery	1	4.55		

Table 5 - Sample characterization

Sessions were scheduled once a day, ranging from 1 to 28 per patient, with an average of 9.18. Of the total of 22 patients, 2 finished the program because they evolved favorably to a state of confusion and started to need other types of interventions, other than MSP (such as Reality Orientation Therapies). Unfortunately and despite already visible gains, even with few sessions, the program had to be interrupted in 14 of the patients because they were transferred and in other 6 because of death.

State of consciousness at the beginning and end of PEM

The majority started MSP in a Vegetative State (63.64%), followed by patients in coma (27.27%) and finally a minority in MSC (9.09%). In the last MSP session, no patient remained in coma, 31.82% presented with CME, 59.09% with vegetative state (VS) and 9.09% progressed to a state of confusion (Graphic 1).

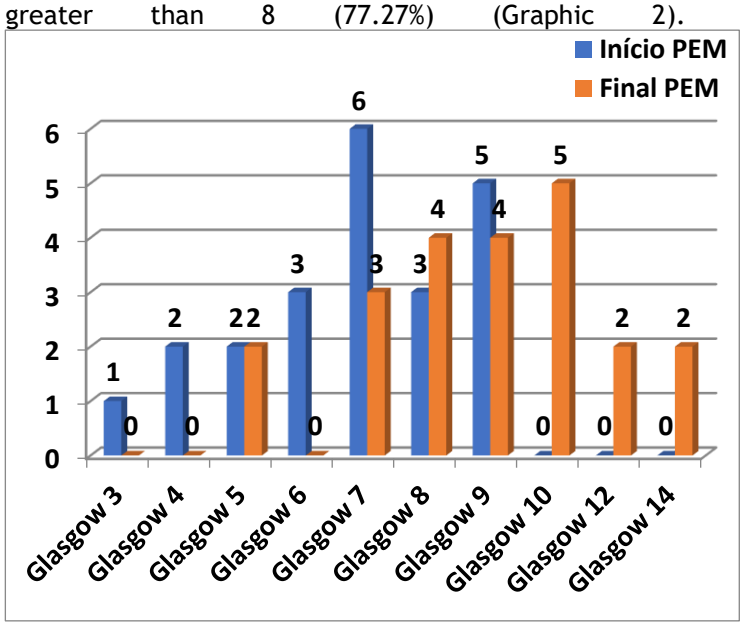


Graphic 1 Distribution of patients according to the State of Conscience at the Beginning and End of the MSP

By analyzing the evolution of each patient, we found that of the 6 in coma, all evolved, 4 of them after only 1 to 4 sessions and the rest in 8 to 11 sessions. Five evolved to the VS and one surpassed the MSC (went to the state of confusion). Of the 14 who started PEM in VS, five evolved to CME in 2 to 8 sessions, one to a state of confusion, and 8 kept the VS. The 2 patients who started with MSC maintained this status.

Glasgow score at the beginning and end of the MSP

The level of awareness on the Glasgow Coma Scale at the beginning of the MSP ranged between score 3 and 9, with a mean of 7. While at the end of the MSP it ranged between score 5 and 14, with a mean of 9. Most of the patients started the MSP with Score 7 or lower (63.64%). At the end of the MSP, most had a score equal to or greater than 8 (77.27%) (Graphic 2).

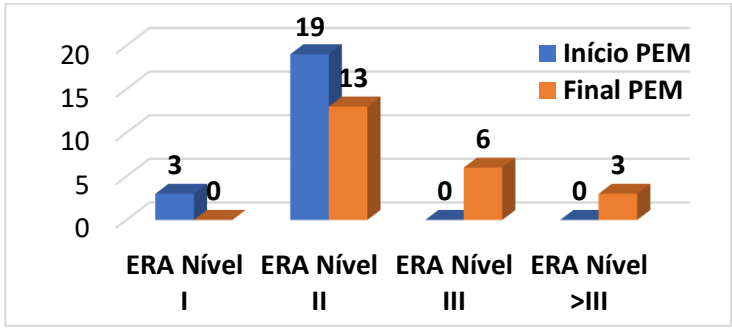


Graphic 2 *– Distribution of patients by Glasgow Score at the beginning and end of the MSP*

For each patient, eight of them did not evolve and in the remaining 14 (63.64%) the evolution was 1 to 8 values with an average of 2.32.

LCFS level at the beginning and end of MSP

The vast majority of patients (86.36%) started MSP at level II of the LCFS and the rest (13.64%) started at level I. At the end of MSP, none remained at level I, just over half (59, 09%) stayed in level II, 27.27% stayed in level III and 13.63% went beyond level III and left the program (Graphic 3).



Graph 3 *- Distribution of patients by LCFS level, at the beginning and at the end of the MSP*

In the evolution of each patient, of the three patients who started MSP at level I of the LCFS, two progressed

to level II and one to III. Of the 19 who started at level II, 10 remained at that level, 6 progressed to level III and 3 surpassed the latter. In total 54, 55% evolved.

Family involvement

The family of 55% of patients was actively involved in MSP. In these, the evolution in the GCS was in average 3.75 points, while in the others the evolution was an average of 0.6 points, that is, 6.25 more.

Behavioral reactions observed in the MSP application

We also registered different reactions to the applied stimulus. We highlight the power of the olfactory stimulus, even in patients in coma and VS, triggering chewing movements, eyelids (blinking, eyes widening), facial/grimaces, head, limbs and hyperventilation. We found that the reactivity to the olfactory stimulus decreased as the patient evolved in his state of consciousness. Upon gustatory stimulation, 14 patients, including those in coma, triggered chewing movements. To visual stimulus the observed reactions, including visual fixation and following stimulus, occurred in 4 patients in CME. and one in VS. 4 CME patients responded to verbal auditory stimulation with blinking and blinking, 2 coma patients responded with tears. One of the MSC patients moved all 4 limbs when seated (vestibular stimulus).

Further gains in functional independence

As already mentioned, in most cases the MSP was interrupted by patient transfer. All needed continuity of rehabilitation nursing care, namely and for this case, cognitive. The question arose as to how far they had progressed. So we went on, as far as possible, along its path. We highlight 3 cases that we know had gains in functional independence, which gives us encouragement to continue investing with our MSP, in these patients with serious neurological sequelae, as a starting point for their continued rehabilitation.

Case 1 – MLCA, female, 76 years old, hemorrhagic stroke due to aneurysm rupture. She started MSP in ICU, with mechanical ventilation, in a coma, GS 7, level I of the LCFS. Patient had 16 sessions, at the end of which she had SG 11 and LCFS level III, evolving to a state of confusion (GS 14). The two daughters were guided by us and actively involved in stimulation. From the observed reactions, we highlight the movement of the right upper limb (healthy side) to the olfactory stimulus, when in VS. She was transferred to another service, then to National Network of Continuous Integrated Care and finally to the Center for Physical Medicine and Rehabilitation (CMFR) in Alcoitão. According to data from the last neurosurgery appointment, patient lives with a daughter, has autonomous walking and some disorientation.

Case 2 – EMLF, female, 46 years old, hemorrhagic stroke due to aneurysm rupture. Patient started MSP in ICU, with mechanical ventilation, in a vegetative state, GS 6, LCFS level II. Patient had 9 sessions, at the end of which she had GS 12 (tracheostomized). The husband was very present and involved in the stimulation under our guidance. From the observed reactions, we highlight chewing movements to the taste stimulation of coffee in VS. Patient progressed even during hospitalization to GS 15 and started Activities of daily living (ADL) training. She was transferred to National Network of Continuous Integrated Care. We found, after the last neurosurgery consultation, living with her husband, presenting autonomous walking, being aware, oriented and independent in the ADL. As a curiosity, the patient, after being asked if she remembered any intervention by the MSP, said that currently couldn't even smell the coffee (Knowing patient appreciated it before) and that patient remembered some lights associating to Christmas lights (optical fibres).

Case 3 – RMFB, male, 21 years-old, severe TBI, started the MSP in Intermediate Care, in MSC, GS 9, level II of the LCFS. Patient had 28 sessions, evolving to GS 12, LCFS level III, maintaining the MSC. The mother was always present and very involved in the stimulation under our guidance. From the observed reactions, we highlight in chronological order: chewing movements to the olfactory stimulus, following with the eyes, moving the 4 limbs when sitting, turning the head to the side of the sound, response with blinking of the eyes, emission of guttural sounds in response to the stimulus verbal. Patient was transferred to the RNCCI and then to the Physical Medicine and Rehabilitation Center of S. Braz de Alportel. After the last neurosurgery consultation, we found that patient was living with his mother, had GS of 15, was walking in a wheelchair (patient reported being able to walk, although unstable, with support), presented with dysarthria and was undergoing oral feeding training, but still with Percutaneous Endoscopic Gastrostomy (PEG).

DISCUSSION

With this project, we wanted to optimize the cognitive rehabilitation of patients with severe changes in the state of conscious, through the application of a Multisensory Stimulation Program. It is therefore essential to evaluate and discuss the application of the MSP, the results obtained and the reactions observed.

Most of our patients had hemorrhagic stroke and TBI as diagnoses, which is in accordance with the main causes mentioned by the CPR Guidelines[5].

MSP application

As for the structuring of our MSP, we considered it adequate, triggering some positive behavioral reactions and we did not observe undesirable reactions, as can occur in situations of sensory overload. In particular, we did not find adverse hemodynamic changes or autonomic dysfunctions. The RCP Guidelines[5], in line with our program, state that in these patients, overstimulation and many stimulus must be avoided simultaneously, not to trigger sympathetic hyperactivity. They recommend that

stimulation should focus on pleasant sensations (favorite music, gentle massage, pets) offered one at a time, for short periods, to minimize sensory overload. And they report that although the studies are not conclusive yet, due essentially to its methodology, controlled stimulation provides the best opportunity to observe responses.

As for our concern with sensory regulation, the data obtained in the study by Pinto[14], through interviews with TBI patients who had been in a coma, also lead her to consider the regulation of cognitive stimulation as important, preferably with an emotional tone.

Tayler [8], neuroscientist, reported in the first person his recovery from a severe hemorrhagic stroke. She refers to the importance of various sensory stimulous combined with family monitoring and alerts for their sensory regulation, with an emphasis on the serenity of the environment and communication, on the need for well-deserved rest after rehabilitation. All these aspects are also included in our MSP.

According to the study by Sun et al.,[15], the use of personalized objects seems to be more effective in triggering responses in patients with alterations in the state of conscious, compared to the use of non-personal objects, in the evaluation of the item "Use of Functional Objects" of the CRS-R scale, the difference being statistically significant. It was also our concern to integrate personal items in MSP.

In another study, by Laureys et al.,[16], it was found that using the patient's name, in relation to the use of other sound stimulus, causes a broader activation at the brain level when using Positron Emission Tomography (PET).

Sharon[17] studied the patient's reaction in VS to familiar faces through functional MRI. The author found that the activated regions were those related to emotional activities in the limbic area. This study showed that familiar stimulus, such as familiar faces, result in a greater number of responses.

The study by Heine et al.,[18] concluded that favorite music and familiar voices have effects on these patients' cognitive and behavioral processes.

We found that in our MSP, the aspects referred to in these studies are covered there.

We also found that some studies focus more on the diagnostic assessment of the state of conscious, for clinical decision-making (for example, in the case of insurance companies) not taking into account that the stimulus applied in the tests will help the patient to progress.

Results of evaluation

With regard to the results obtained, we emphasize that, in more than half of the patients, we were unable to continue the program because they were transferred. It would be important for the MSP to be part of good practices in other institutions so that there was continuity of care. We trust that, at least, the family members we advised had some follow-up, as the results show that patients who had their family actively involved progressed more points in average on the GCS. Therefore we recommend encouraging family involvement whenever possible. As stated in the RCP Guidelines[5], this involvement is a generally welcome opportunity for family and friends to play a positive role during visits.

The results of our MSP show that more than half of the patients evolved in their state of conscious (54.55%), in the GS (63.64%) and in the LCFS (54.55%). If the program had continued, how many more patients would evolve? In the study by Doman et al.,[19], of the 200 patients with brain damage and GS equal to or less than 6, who underwent a MSP, 91% emerged from a coma. However, Lombardi et al.,[20], when reviewing the literature on sensory stimulation in patients with brain injuries who were in a coma or VS, found that the few controlled studies that exist are of relatively low quality, and therefore not the effectiveness of these programs can be clearly demonstrated.

Also Cabral et al.,[6], in a literature review, concluded that there is still no scientific proof of the effectiveness of MSP.

Observations during MSP application

It was with the olfactory stimulus that we observed more reactions, especially in patients in coma and VS. We know from neurophysiology that smell has direct access to the brain without going through the thalamus as in other directions[21].

Freiherr[22] states that olfactory information not passing through the thalamus, on its way to the neocortex, may be the reason for the multiplicity of unconscious processes involved in olfactory perception. The olfactory system is strongly connected with the limbic system, resulting in responses to odors with a strong emotional tone and a robust relationship with memory processes. These characteristics of the olfactory system form the basis of the perception of smell that makes it unique, among other sensory perceptions.

The fact that olfactory and gustatory reactions are evident even in patients in coma, goes against what Caldas[23] mentions, about smell and taste, "they seem to be felt with functions that are more disconnected from cognition and more adapted to the information of more primitive systems of nervous function".

CONCLUSION

We conclude that MSP can contribute to improving the state of conscious of most patients with severe changes in the state of conscious. Our experience with this project leads us to advocate the involvement of the family as an important supporter of the MSP. Also, family stimulus, due to their emotional richness, are crucial to trigger behavioral responses in these patients.

The olfactory stimulus, due to the observed reactions and knowing that it has a direct circuit to the brain,

which prints a strong emotional tone and is related to memory processes, could be of great importance for the awakening of conscious, requiring further investigation.

There are few studies, not always recent and with a methodology that does not allow to clearly prove the effectiveness of multisensory programs. However, there are more recent and reliable studies[15,17,18] on specific stimulous, but more with the aim of diagnostic evaluation.

By carrying out this project and analyzing its results, we intend to contribute to the development of good practices in cognitive rehabilitation nursing care for these patients and make new contributions to know the impact of applying a MSP in patients with severe disorders of the state of conscious, motivating future studies.

It is, therefore, important to continue to research to what extent these programs contribute to the cognitive rehabilitation of these patients.

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ANÁLISE DA ACESSIBILIDADE, ACESSOS E CERTIFICAÇÕES DAS INFORMAÇÕES DE UM FÓRUM VIRTUAL DE SAÚDE

ANÁLISIS DE ACCESIBILIDAD, ACCESO Y CERTIFICACIONES DE INFORMACIÓN DE UN FORO VIRTUAL DE SALUD

ACCESSIBILITY ANALYSIS, ACCESS AND CERTIFICATIONS OF INFORMATION FROM A VIRTUAL HEALTH FORUM

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RESUMO

Introdução: A Espinha Bífida (EB) é a mais frequente malformação congênita no mundo, sendo responsável por importantes sequelas neurológicas, compatível com a vida. Diante disso, faz-se necessário identificar e desenvolver tecnologias educacionais, que auxiliem na capacitação e no apoio a indivíduos com EB e seus familiares. Nessa direção, foi desenvolvido um fórum virtual para indivíduos com EB e seus familiares, o MieloFórum.

Objetivo: A proposta deste estudo é avaliar os acessos, a acessibilidade dos seus usuários e garantir uma certificação de qualidade ao mesmo.

Método: Para a análise de erros de HTML foram coletados os erros de acessos do MieloFórum, analisado os acessos e submetido a uma certificação de qualidade.

Resultados e discussões: o fórum foi desenvolvido e avaliado, sendo encontrado o total de 28 problemas no código do fórum, levando em consideração as regras de padronização do World Wide Web Consortium mostrou-se abrangente em acessos no período analisado e submetido a certificação de qualidade. Foram mais de 1500 acessos em 7 meses com uma demanda em diversos países.

Conclusão: A submissão do MieloFórum em uma ferramenta de análise da acessibilidade mostrou-se útil para o julgamento e a correção dos problemas identificados, potencializando-o juntamente com a certificação de qualidade.

Descritores: Reabilitação,Acesso aos Serviços de Saúde, Fórum de Saúde.

RESUMEN

Introduccíon: La Espina Bífida (EB) es la más frecuente malformación congénita en el mundo, siendo responsable por importantes secuelas neurológicas, compatible con la vida. Por eso, se hace necesario identificar y desarrollar tecnologías educativas, que ayuden en la capacitación y en el apoyo a individuos con EB y sus familiares. En esa dirección, se desarrolló un foro virtual para individuos con EB y sus familiares, el MieloFórum.

Objetivo: La propuesta de este estudio es evaluar los accesos, la accesibilidad de sus usuarios y garantizar una certificación de calidad al mismo.

Método: Para el análisis de errores de HTML fueron recolectados los errores de accesos de MieloFórum, analizado los accesos y sometido a una certificación de calidad.

Resultados y Discusiones: el foro fue desarrollado y evaluado, encontrando el total de 28 problemas en el código del foro, teniendo en cuenta las nuevas reglas de estandarización del World Wide Web Consortium, se mostró amplio en accesos en el período analizado y sometido a certificación de calidad . Fueron más de 1500 accesos en 7 meses con una demanda en diversos países.

Conclusíon: La sumisión del MieloFórum a una herramienta de análisis de la accesibilidad resultó útil para el juicio y la corrección de los problemas identificados, potenciándolo junto con la certificación de calidad

Palabras clave: rehabilitación, acceso a servicios de salud, foro de salud.

ABSTRACT

Introduction: Spina Bifida (SB) is the most frequent congenital malformation in the world, responsible for important neurological sequelae, compatible with life. Given this, it is necessary to identify and develop educational technologies, which help in the training and support to individuals with SB and their families. In this direction, a virtual forum was developed for individuals with SB and their relatives, MieloForum.

Objective: The purpose of this study is to evaluate the accesses, the accessibility of its users and to guarantee a quality certification to the same.

Method: For the analysis of HTML errors, the access errors of MieloForum were collected, the accesses analyzed and submitted to a quality certification.

Results and Discussions: The forum was developed and evaluated, and a total of 28 problems were found in the forum code, taking into account the new rules of standardization of the World Wide Web Consortium, it was comprehensive in accesses in the analyzed period and submitted to quality certification . There were more than 1500 accesses in 7 months with a demand in several countries.

Conclusion: MieloForum's submission to an accessibility analysis tool proved to be useful for judging and correcting identified problems, enhancing it together with quality certification.

Keywords: Rehabilitation, Access to Health Services, Health Forum

INTRODUCTION

MieloForum was developed by a group of researchers and health professionals from universities in Brazil and Germany, with experience in the rehabilitation of people with Myelomeningocele (MMC), where they had the idea of making a virtual forum for Brazilians with MMC, based on a German model (just like it exists in Germany), in order to help people exchange information to share doubts, knowledge, difficulties and experiences, creating a support and learning network.

Accessibility in web tools refers to the inclusive practice of making websites that can be used by all people with or without disabilities. When websites are properly designed, developed and edited, all users can have equal access to information and functionality. Access in a web tool, on the other hand, refers to how easy it is for a user to go from one page to another within your tool. There is also the interaction between users, which refers to the ability to have a social interaction within the forum and how efficient it is[1].

Currently, the population searches for health information on the internet. Therefore, health researchers are concerned about promoting and disseminating quality health information. In this sense, in 1995, after a conference on health and the internet, held in Geneva, Switzerland, a foundation called Health on the Net Foundation (HON) was created, founded to encourage the dissemination of quality health information to patients, professionals and the public in general, and to facilitate access to the latest health data via the internet. HON created a code to establish an ethical standard, issuing certification for healthcare websites: the HONcode[2].

HONcode certification is a code of ethics that aims to ensure the dissemination of quality health information. It certifies a website's intention to publish transparent and quality information. Thus, HONcode guides website managers in creating a minimum set of mechanisms to provide objective and transparent medical quality information tailored to the needs of the public. Websites in the healthcare area that request certification and websites that are already certified are committed to respecting the HONcode and requirements for certification.

Possession of the HONcode stamp allows a website to demonstrate its intention to contribute to quality healthcare information by publishing objective and transparent information[2].

To receive the certification, it is necessary to comply with the 8 principles of HONcode, they are:

Principle 1 - Authority: All medical or health advice hosted and provided on the website will be given only by trained and qualified professionals, unless a clear statement is made that the advice offered is from an individual not qualified in the medical field or organization.

Principle 2 – Complementarity: the information provided on this website is intended to support, and not to replace, the relationship that exists between a patient/website visitor and her/his existing physician.

Principle 3 – Confidentiality: Privacy of data relating to patients and individual visitors to a medical/health website, including their identity, is respected by this website. Those responsible for the website are committed to honor or exceeding the legal privacy/medical information requirements that apply in the country and state where the Website and its mirrors are located.

Principle 4 – Attribution: if it is applicable, the information contained in the website will be supported by clear references to the consulted sources, and, when possible, with HTML links to these sources. The date each medical page was last modified will be displayed clearly (eg: at the bottom of the page).

Principle 5 - Justifications: Any claims made about the benefits and/performance of a specific treatment, product or commercial service will be supported by adequate, balanced evidence as indicated in Principle 4.

Principle 6 – Transparency: website designers will seek to display information as clearly as possible and provide contact addresses for visitors who want additional information or help. The webmaster will display his email address clearly throughout the website.

Principle 7 - Financial Disclosure: Contributions to this website will be clearly identified, including the identity of commercial and non-commercial organizations that have contributed funding, services or material to the website.

Principle 8 – Advertising: if advertising is a source of funding, this should be clearly stated. A brief description of the disclosure policy adopted by the website owners will be displayed on the website. Advertisements and other promotional materials will be presented to visitors in a manner and context that makes it easy to differentiate them from the original material produced by the website's managing institution.

For online collaborative platforms, such as the virtual forum, in addition to the eight principles mentioned above, privacy and messages are also evaluated.

The development of a tool that allows the dissemination of quality health information and the exchange of experiences among users, such as a virtual forum, brings the responsibility to ensure that this information is passed on with quality for the real intention of serving as support to the population, with that in mind, this study aims to analyze access, accessibility and certify the information of a virtual health forum

METHOD

This study is a descriptive research. For being a project with free access data and without the possibility of identifying the participants, thus there was not the approval of the research ethics committee.

The accessibility check was carried out using the Web Accessibility Checker, a web evaluation tool that helps developers to evaluate the source code of their websites[1]. AChecker uses the standards detailed in the World Wide Web Consortium, the main international standardization organization for the World Wide Web (WWW, World Wide Web)[3]. With AChecker, a scan was carried out in the source code, page by page of the MieloForum, checking the problems and potential problems. After this scan, the tool issued a report identifying the problems and potential problems. The data was organized and analyzed with the help of a programming language PHP (Hypertext Preprocessor) and the Excel program.

HON recommends that the quality of websites should be certified by a neutral organization based on quality criteria, such as HONcode[6]. MieloForum's certification by Health on the Net Foundation was carried out after its submission to the Health on The Net Code on the HON website and obtaining the certification seal, with annual reassessment. The certification and reassessment processes are illustrated in figure1.

Web indicators allow measuring and evaluating scientific and technical activities, where several indicators can be built and analyzed, such as: size or number of objects in a web space in countries, regions, organizations, people, in terms of content; examination of connections between pages and sites; quantity and characteristics of visits each site receives; network density; number of visits received by a website; number of links received[7]. For the statistical analysis, the Google analytics tool was used, which is a free tool that allows you to obtain statistics from a website or virtual store in order to understand the behavior of users. The website was analyzed from the period of public availability November 28, 2014 to June 30, 2015.

RESULTS

Development of the virtual forum: the forum was built on the PhpBB system (forum management system for the Internet), using PHP scripts, as well as the German forum that collaborated with this study. A customized version of the style was used, set of group of images, templates and themes, coffee time. The customization was carried out with the objective of making it easier to navigate and understand the forum users.

The customization went through the following steps: customization of buttons and tabs, choice of colors and inclusion of MODs (modifications to the forum). Highlighting the constant updating of the forum, the MODs added so far were: Private_Message_Moderation button, used to control the private message among forum users, and FAQ_Manager, used to facilitate changes to the frequently asked questions page.

Along with the changes, the inclusion of theoretical material on the topic of the forum (MMC, intermittent vesical catheterization, among others) began to be made, considering the dynamics and ease of language for the target audience.

To analyze accessibility, the Web Accessibility Checker (AChecker) tool was used. This tool checks individual HTML pages for compliance with accessibility standards to ensure the content is accessible to everyone.

After the analysis, 28 problems were found with the forum code, as shown in table 1.

The problems identified on each page will be described below, followed by the analysis and corrections carried out:

Page 1: Seven issues were found with the forum code:

From the first to the sixth were problems with the <b> code (bold in html). The Web Accessibility Checker currently uses HTML5 bases for accessibility assessment, that is, it is claiming that it should be modified in the source code, every <b> (bold in html) by (bold in HTML5). However, as we are using a tool, phpBB, which is made to facilitate both user navigation and possible changes in the forum through future administrators and moderators, the ideal is to keep the standard of the phpBB tool. Thus, after the analysis, no corrections were needed for these 6 identified problems.

Figure 1 *- HON Certification Process*

Number and name of page	Problems
1. Forum index	7
2. Enter	0
3. Register	0
4. More usual questions	5
5. Welcome to "MieloForum"	0
6. MieloFórum/Discussions	0
7. Information on MieloFórum	8
8. Terms of use MieloFórum	0
9. Who we are	0
10. Contact	0
11. Know more about Mielomeningocele	8
12. What is Spina Bifida?	0
13. What is Neurogenic Bladder?	0
14. Intermittent Vesical Catheterization	0
15. Urinary infection and intermittent bladder catheterization	0
15 pages	**28**

Table 1 *– Distribution of MieloFórum pages according to the problems identified in the AChecker evaluation. Survey conducted in a virtual environment, 2014 . Source: AChecker*

The seventh problem was with the <h1> code (header or title in html) claiming it was empty. After analyzing, it was found that the <h1> is one of the possible modifications that can be done through a phpBB tool, the ACP (Administration Control Panel). So a fix would be needed, however we chose to use the forum logo as the title. Also, as the forum may be modified in the future, for updates and adaptations to its audience, removing the codes <h1> would be removing this utility from our tool.

Page 4: Five issues were found with the forum code:

The first through the fifth were problems with the <i> code (italics in html). The Web Accessibility Checker currently uses HTML5 bases for accessibility assessment, that is, it is claiming that it should be modified in the source code, all the <i> (italics in html) by (bold in HTML5). But as we are using a tool, phpBB, which is made to facilitate both user navigation and possible changes in the forum through future administrators and moderators, we chose to keep the standard of the phpBB tool and not make any changes.

Page 7 and 11: We found eight problems with the forum code:

From the first to the eighth were problems with the <b> code (bold in html). The Web Accessibility Checker currently uses HTML5 bases for accessibility assessment, that is, it is claiming that it should be modified in the source code, every <b> (bold in html) by (bold in HTML5). But as we are using a tool, phpBB, which is made to facilitate both user navigation and possible changes in the forum through future administrators and moderators, we chose to keep the standard of the phpBB tool and not make any changes.

Pages 2,3,5,6,8,9,10,12,13,14 and 15:

No problems were found.

AChecker also highlighted the possible problem with naming our objects in CSS (Cascading Style Sheets - a style sheet language used to define the presentation of documents written in a markup language such as HTML), claiming that objects have titles irrelevant, however these titles are used by the ACP to provide an easier way for administrators to change the forum.

MieloForum Certification by HONcode: the forum was submitted to HONcode certification, the Health On the Net Foundation's initiative to improve the quality of medical information on the Internet. The website was viewed and evaluated for compliance with the HONcode principles and the following modifications/changes needed to be made:

Principle 3 – Confidentiality – Creation of a description or a page containing the privacy policy of the data collected by the website. A page was created in the forum with the name: "MieloForum Terms of Use" with all the confidentiality and use policy of the forum.

Principle 7 - Source of Funding - How is the website financed? - Clearly indicate how your website is funded. A page was created in the forum with the name: "Partners" with all the funding to MieloForum.

Principle 8 - Honesty in advertising and editorial policy - It must be clearly stated that the website does not have advertising links or banners. The phrase: "MieloForum currently does not have any form of advertising" was added on the "Partners" page.

Health 2.0 Principles - Apply to online collaborative platforms, such as virtual forums. Following this principle, four more items were added to the "MieloForum Terms of Use", offering clarification to the user regarding the privacy, messages, complementarity and authority of MieloForum. All corrections suggested by HON's certifiers were carried out and the certification request was resent and granted in March.

The MieloForum accesses/sessions data were categorized according to table 2.

Accesses	1,548
Users	938
Page views	8,574
Rejection rate	57.04%
Percentage of new sessions	60.34%
Page/Session	5,54%

Table 2: *MieloFórum access/session data. Survey conducted in a virtual environment, 2014. Source: Google Analytics*

We observe in Table 2 that MieloForum obtained in its analysis period 1,548 sessions, with 938 users, 8,574 page views and an average rejection rate of 57.04%, which means that the new user was connected to the MieloFórum page for less than 3 minutes, 60.34% of new sessions and an average of 5.54 pages per session.

The distribution of sessions in MieloForum is categorized according to the number and origin (country) of accesses, as shown in table 3.

Country	Accesses	%
Brazil	671	43
Germany	293	18.93
Russia	133	8.59
The United States	126	8.14
China	123	1.94
Portugal	30	1.61
Japan	25	1.16
South Korea	18	0.78
Netherlands	12	0.78
India	12	0.71
Canada	11	0.52
England	8	0.52
Angola	8	0.39
Taiwan	6	0.39
Italy	6	0.32
Other countries	5	3.41
Not Set	61	7.95
Total of Accesses	**1548**	**100**

Table 3: *Distribution of sessions to MieloFórum according to the country of access. Survey conducted in a virtual environment, 2015. Source: Google Analytics*

It can be seen in Table 3 that Brazil leads the number of accesses to MieloForum as expected with 43% of accesses, with 7.95% the number of accesses from computers not identified by Google analitycs by their country of origin, Germany obtained 18, 93% of accesses followed by Russia (8.59%), United States (8.14%), China (1.94%), Portugal (1.61%), Japan (1.16%), South Korea (0.78%), Netherlands (0.78%), India (0.71%), Canada (0.52%), England (0.52%), Angola (0.39%), Taiwan (0 .39%), Italy (0.32%) and other countries with 2 accesses or less added up (3.41%) of accesses to MieloForum.

The word "not set" displayed in the Google Analytics tables below means that the website receives traffic from a Google AdWords account that is not linked to viewing reports, ie the IP is not recognized by the system.

The distribution of sessions on MieloForum from Brazil is categorized according to the number of accesses and the corresponding state, as shown in table 4.

States	Accesses	%
São Paulo	251	37.41
Minas Gerais	86	12.82
Paraná	64	9.54
Rio de Janeiro	63	9.39
Santa Catarina	33	4.92
Rio Grande do Sul	22	3.28
Distrito Federal	15	2.24
Piauí	15	2.24
Goias	14	2.09
Para	14	2.09
Bahia	12	1.79
Ceará	12	1.79
Mato Grosso do Sul	11	1.64
Pernambuco	11	1.64
Maranhão	7	1.04
Paraíba	7	1.04
Rio Grande do Norte	6	0.89
Mato Grosso	5	0.75
Amazonas	4	0.60
Espírito Santo	4	0.60
Amapá	4	0.60
Sergipe	3	0.45
Roraima	1	0.15
Tocantins	1	0.15
Acre	1	0.15
Not Set	5	0.75
Total	**671**	**100**

***Table 4** – Distribution of sessions to MieloFórum in Brazil according to access status. Survey conducted in a virtual environment, 2015. Source: Google Analytics*

According to table 4, São Paulo is the state with the highest number of accesses to MieloForum with 37.41% of accesses, followed by Minas Gerais (12.82%), Parana (9.54%), Rio de Janeiro (9, 39%), Santa Catarina (4.92%), Rio Grande do Sul (3.28%), Federal District (2.24%), Piaui (2.24%), Goias (2.09%), Pará (2.09%), Bahia (1.79%), Ceará (1.79%), Mato Grosso do Sul (1.64%), Pernambuco (1.54%), Maranhão (1.04%), Paraíba (1.04%), Rio Grande do Norte (0.89%) Not Set (0.75%), Mato Grosso (0.75%), Amazonas (0.60%), Espirito Santo (0.60 %), Amapá (0.60%), Sergipe (0.45%), Roraima (0.15%), Tocantins (0.15%), Acre (0.15%).

Most accesses came from computers (79.97%), while 18.48% of accesses were from cell phones and 1.55% from tablets.

DISCUSSION

The development of a virtual health tool that seeks to be accessible and appropriate, both for people with MMC and their families, favors access to information about the malformation and the exchange of experience among users, increasing knowledge and allowing the formation of a network of mutual support. In this sense, it is important to consider that, in addition to encouraging the population and professionals to use technologies, family members/caregivers should be considered and their participation included[8].

The forum manager system for the Internet that is being used, phpBB, is an old platform and it has some problems with the new WW3 standards and consequently AChecker. The style used was developed by the phpBB community, however, not all desired changes were allowed during forum development, as platform support is limited.

The internet presents an extensive content of health information available to a diverse population, which can present the most different skills and requirements[4,9]. In addition to the search for information, people seeking information want to share their concerns and experiences[10].

Thus, ensuring accessibility to all users is a challenge, even though there is an extensive set of recommendations made available by the World Wide Web Consortium[3]. Thus, different tools for accessibility assessment are proposed, which compare artifacts to guidelines in order to obtain automated results, producing tests and generating various data, such as the location of the problem in the code and the specified flaws[4]. Processing these data, through the availability of a common language, AChecker was used to review the accessibility of Web pages based on a variety of international accessibility guidelines. According to the results, it was observed that the PhpBB platform used did not allow all the changes indicated by AChecker and, therefore, it would be recommended to transport MieloForum to a more modern platform.

The recognition of the central role of the Internet as a source of health information has generated a growing concern with the quality and transparency of this information obtained by the population[11-12]. In response to these concerns, a series of initiatives have been developed to establish quality criteria for health-related websites and to help users find quality information. In this direction, MieloForum was submitted, the quality labeling, carried out by the HON, with a focus on ethical standards related to online publication. Since HON recommends that the quality of websites must be certified by a third and neutral organization, according to quality criteria such as HONcode.[2,4]

MieloForum's certification by HONcode was extremely productive, as it allowed modifications to the tool, essential for its adequacy, raising it to international standardization. It is noteworthy that the same concern with certifying virtual tools was demonstrated by other researchers, who used HONcode[4,11,12].

People with disabilities or chronic illness are more likely to use the internet to access websites with health information. In addition to seeking information, information seekers want to share their afflictions and experiences.

Access to the MieloForum webpage was made available to the public from November 22, 2014, with a low number of accesses due to continuous maintenance to improve it and lack of dissemination until February 28, 2014, when it was created MieloForum's official page on the most used web relationship page today, Facebook, where accesses have been growing continuously, reaching 1,548 accesses and reaching 50 different countries in just 5 months, covering a varied audience and from different regional locations such as São Paulo, Belo Horizonte, Rio de Janeiro and Paraná, and international countries including countries such as the USA, Germany and several others as shown in Table 3, demonstrating the great demand and interests of patients with Spina Bifida. The rejection rate shown at 57.04% is due to the fact that the Forum is currently only available in Portuguese, and a large number of accesses were of an international level, causing great difficulty for users and preventing them from continuing to access the information available.

It was observed that 20.03% of accesses to MieloForum were from mobile devices (cell phones or tablets). The number of people who reported accessing the internet using their cell phone grew 65% in the last year[13], which shows a possible need to create an application to facilitate access via mobile networks.

CONCLUSION

The development of a tool that allows the dissemination of quality health information and the exchange of experiences among users, such as a virtual forum is always a challenge, especially when this tool is aimed at an audience with physical and cognitive limitations, such as individuals with Spina Bifida.

In this sense, the analysis of accessibility, with AChecker, was essential to guarantee and to facilitate the access of the target audience of this virtual health forum, in addition to indicating the need to transfer the platform used. The certification by HONcode elevated MieloForum to an international standard, aiming at the transparency and clarity of health information, providing the user with security when using the forum.

Following the idea of innovation and new information technologies, a tool like MieloForum has a lot to grow, requiring continuous maintenance and improvement to clarify and provide users with quality health information. Due to access from other countries, the great importance of providing an English version was observed, in order to increase access and decrease the rejection rate of users who do not speak Portuguese.

The forum is a privileged space for discussions and debates; it is a very versatile communication tool. It's a space where everyone can see what everyone else is doing, even if not at the same time. In the teaching and learning process, the benefits consist of the meta-cognition process where the participant, when expressing their ideas, needs to organize them clearly and objectively and finally analyze what they have learned, thus becoming a bank of information. Participating in forums allows us to learn, teach and establish relationships with other people[10].

The development of a forum is always a challenge, and the high number of accesses shows the importance and demand of bringing people with spina bifida a virtual tool that allows the clarification of doubts about health and the opportunity for interaction, as well as sharing of experiences. MieloForum proved to be not only a source of information on health, but also a network of mutual support for this population.

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NOVOS DESAFIOS PARA VELHOS PROBLEMAS: O ENFERMEIRO ESPECIALISTA EM ENFERMAGEM DE REABILITAÇÃO NA PROMOÇÃO DA ACESSIBILIDADE

NUEVOS DESAFÍOS PARA VIEJOS PROBLEMAS: EL ENFERMERO ESPECIALISTA EN ENFERMERIA DE REHABILITACIÓN EN LA PROMOCIÓN DE LA ACCESIBILIDAD

NEW CHALLENGES FOR OLD PROBLEMS: THE REHABILITATION NURSE ON ACCESSIBILITY PROMOTION

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RESUMO

Enquadramento: A acessibilidade constitui um elemento crucial na qualidade de vida das pessoas com mobilidade condicionada, sendo imprescindível para o exercício dos seus direitos. A sua efetividade envolve uma equipa multidisciplinar, que deverá incluir o Enfermeiro Especialista em Enfermagem de Reabilitação, dado que a este compete capacitar a pessoa com mobilidade condicionada para a reinserção e exercício da cidadania.

Objetivos: Refletir sobre os direitos das pessoas com mobilidade condicionada; compreender a intervenção do Enfermeiro Especialista em Enfermagem de Reabilitação na promoção da acessibilidade e na inclusão social.

Principais tópicos em análise: Legislação e planos de promoção da acessibilidade e da inclusão social; e a intervenção do Enfermeiro Especialista em Enfermagem de Reabilitação no âmbito destas problemáticas.

Conclusão: As condições de acessibilidade constituem um dos fatores discriminatórios para as pessoas com mobilidade condicionada. Assim, compete ao Enfermeiro Especialista em Enfermagem de Reabilitação paralelamente com as entidades competentes, encarar esta problemática como uma urgente oportunidade para a mudança.

Palavras-chave: Acessibilidade Arquitetônica; Enfermagem em Reabilitação; Limitação da Mobilidade; Pessoas com Deficiência.

RESUMEN

Encuadramiento: La accesibilidad es un elemento crucial en la calidad de vida de las personas con movilidad reducida, siendo imprescindible para el ejercicio de los sus derechos. La efectividad implica un equipo multidisciplinario, que deberá incluir el Enfermero Especialista en Enfermería de Rehabilitación, dado que a éste compete capacitar a la persona con movilidad condicionada para la reinserción y ejercicio de la la ciudadanía.

Objetivos: Reflexionar sobre los derechos de las personas con movilidad reducida; comprender la intervención del Enfermero Especialista en Enfermería de Rehabilitación en la promoción de la accesibilidad y la inclusión social.

Principales temas en análisis: legislación y planes de promoción de la accesibilidad y de la inclusión social; y la intervención del Enfermero Especialista en Enfermería de Rehabilitación en el marco de estas problemáticas.

Conclusión: Las condiciones de accesibilidad constituyen uno de los factores discriminatorios para las personas con movilidad reducida. Por lo tanto, compete al Enfermero Especialista en Enfermería de Rehabilitación paralelamente con las autoridades competentes, encarar esta problemática como una urgente oportunidad para el cambio.

Palabras clave: Accesibilidad Arquitectónica; Enfermería en Rehabilitación; Limitación de la Movilidad; Personas con Discapacidad.

ABSTRACT

Background: Accessibility is a crucial element in the quality of life of disabled people, being indispensable for the exercise of their rights. Its effectiveness involves a multidisciplinary team, which should include the rehabilitation nurse, as it is the one responsible to empower the disabled person for the reintegration and exercise of citizenship.

Objectives: To reflect on the rights of persons with disabilities; to understand the intervention of the specialist nurse in rehabilitation nursing in promoting accessibility and social inclusion.

Main topics under analysis: legislation and plans to promote accessibility and social inclusion; and the intervention of the specialist nurse in rehabilitation nurse in the context of these problems.

Conclusion: Accessibility conditions constitute one of the discriminatory factors for disabled people. Thus, the rehabilitation nurse in parallel with the competent authorities should face this problem as an urgent opportunity for the promotion of a change.

Keywords: Architectural Accessibility; Rehabilitation Nursing; Mobility Limitation; Disabled People.

INTRODUCTION

People with disabilities are people using wheelchair, unable to walk or unable to travel long distances, with sensory difficulties (blind or deaf) and those who are temporarily disabled (pregnant women, children and the elderly). These people are confronted with environmental barriers that prevent their active and integral civic participation, and it is the State's obligation to guarantee and ensure their rights[1].

The International Classification of Functioning, Disability and Health (ICF) co-relate disability with functionality. It defines these as the result of a complex relationship between the individual's health condition (diseases, disorders and injuries) and personal factors (social, economic, literary), with external (environmental) factors that represent the circumstances in which the individual lives[2]. People with disabilities are confronted with the problem of architectural barriers on a daily basis.

According to some authors, architectural barriers are present in different spaces and contexts and constitute obstacles, hindering or preventing the free movement of people experiencing a disability (transitory or permanent)[3].

Accessibility, ranging from technical aids to access to buildings, is an essential condition for the full exercise of rights. Ensuring autonomy and access to existing goods and services in society for all has been the objective of adopted and updated legislation, as well as action plans by public and private entities, giving greater visibility to this cause in order to respect the rights people with mobility impairment and an inclusive society for all.

Currently, there are more than one billion people in the world who have some form of disability, and among these, 200 million have considerable functional difficulties[4]. Moreover, it is predicted that in Europe, in the year 2050, 22% of the population will be under 20 years old and around 40% will be over 65 years-old[5]. It is thus expected that there will be an increase in the population with restricted mobility in a global way.

According to the 2011 Census[6], in Portugal it is estimated that there are 18% of people with limited mobility, with an increase in the prevalence of this population of 50% by 2050[7].

The promotion and guarantee of full accessibility is essential to citizens' quality of life of to the exercise of their rights as participating members of a community governed by the principles of a democratic society, in order to ensure their real participation and civic integration. Thus, accessibility translates into advantages for all: it allows the full exercise of citizenship and active participation in the various fields of activity of society; it ensures, to the greatest possible number of citizens, the possibility of living integrated in their community in situations of equal opportunities; contributes to the spaces and services providing conditions of safety and comfort; and ensures lesser burdens on autonomy and greater independence for all citizens[8].

Taking into account the competences of Rehabilitation Nurse (RN), their importance in promoting inclusive environments becomes unquestionable. Thus, they should be involved in improving accessibility conditions, with a more proactive attitude in this area with a view to increasing the gains in quality of life for people with limited mobility. In partnership with local government authorities, they can "constitute 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 people with limited mobility"[9].

The elimination of architectural barriers is essential so that people with limited mobility can have access to all systems and services in the community and thus enjoy their rights as citizens[8].

Within this framework, it was considered relevant to reflect on the contribution of the RN in promoting accessibility and social inclusion, based on current accessibility legislation and policies, as well as the documents regulating the professional and theoretical practice nursing references.

To carry out this theoretical study, we focused on the legislation, programs, action plans and policies in force, on the specific competences of the RN, the quality standards of specialized care in rehabilitation nursing, and publications on this topic.

Although the environment, as a metaparadigmatic concept, is considered by the RN as a facilitating or hindering component in the adaptation of the person with mobility irmpairment, the existence of gaps in the intervention at this level, motivated this theoretical article. Following this reflection, in addition to highlighting the contribution of the RN, we intend to raise the awareness of these professionals for a sustained intervention in the scope of this issue,

which is crucial for the quality of life and the exercise of citizenship of the person with mobility impairment.

DEVELOPMENT

In the Convention on the Rights of Persons with Disabilities (CRPD)[10], disability is defined as an evolutionary concept that is not limited only to the limitations resulting from a pathological process. It also results from the interaction between these people and the behavioral and environmental barriers that prevent their full and effective participation in society, on equal terms with other people. Thus, the existence of architectural barriers accentuates the disability of any person with disabilities/limitations and increases their vulnerability.

The same convention[10] emphasizes the universal principles of dignity, integrality and non-discrimination, defining the general obligations of governments regarding the mainstreaming of the various dimensions of disability in their policies. It also reaffirms the specific obligations related to making society awareness of disability, combating stereotypes and equal access for people with disabilities.

Thus, effective and appropriate measures must be taken to enable people with disabilities to "achieve and maintain a maximum degree of independence, full physical, mental, social and vocational ability and full inclusion and participation in all aspects of life" (Article 26 of CDPD). This same convention safeguards the right to live in an accessible physical environment (Article 9)[10]. In view of these rights of persons with disabilities, the second point of article 71 of the Constitution of the Portuguese Republic (CRP) reinforces the obligation of a "national policy of prevention and treatment, rehabilitation and integration of citizens with disabilities and support to their families" [11].

It is essential to make people aware of the equality of rights, being a duty of the State the "promotion of the well-being and quality of the population and the real and legal-formal equality between all the Portuguese people" (paragraph d) of article 9 and article 13 of the CRP[11].

Regarding the issue of accessibility, the normative regulation through Decree-Law No. 123/97, aimed to introduce technical standards, in order to eliminate urban and architectural barriers in public buildings, collective facilities and public roads[12].

After the insufficiency of the solutions proposed by that diploma, the reffered Decree-Lawwas revoked[12], with the creation of a new diploma, which "defines the regime of accessibility to buildings and establishments that receive the public, public roads and buildings housing, aiming at the construction of a global, coherent and orderly system in relation to accessibility", in order to provide people with limited mobility conditions equal to others. It is important to mention the extension of the scope of application of technical standards for accessibility to residential buildings (access to dwellings and their interiors), to ensure mobility without restrictions[1].

With the application of Decree-Law No. 163/06, it was expected that by February 2017, the deadline for the adaptation of spaces (buildings, establishments and equipment for public use whose construction date was prior to 1997), there would not exist architectural barriers in places of public use. However, the evidence demonstrates that architectural barriers still remain[9].

Both at European and national level, strategies have been developed to promote architectural accessibility, which is implicit in one of the proposals of the XXI Constitutional Government, which includes the development of the program "Inclusive Territories" [3].

The European Union (EU) has developed actions to promote, for example, accessible tourism services, where we highlight the pioneering project in Portugal: Lousã – Accessible Tourism Destination[13].

In order to improve mobility and accessibility for all, Portugal intends to combat this form of discitizenship by 2020 (Action Plan for Urban and Sustainable Mobility – PAMUS). Recognising the importance of knowledge about the needs of people with mobility impairments, the Portuguese Commission for Standardization in the field of Tourism (Subcommittee 8 - Accessible Tourism) validated a Guide to Good Practices for Accessibility in Hospitality with the aim of promoting quality in the accessibility of tourist services[13].

The International Day of Persons with Disabilities is celebrated annually and in 2018, the theme was the Empowerment of Persons with Disabilities and the ensuring inclusion and equality. In this celebration visibility to the eleventh goal of the 2030 Agenda – 17 Sustainable Development Goals – inclusive, safe, resilient and sustainable cities and communities[14]. This consists of "providing access to safe, accessible, sustainable and affordable transport systems for all, improving road safety through the expansion of the public transport network, with special attention to the needs of vulnerable people, women, children, people with disabilities and the elderly; increase inclusive and sustainable urbanization and capacities for participatory, integrated and sustainable planning and management of housing conditions in all countries; provide universal access to safe, inclusive, accessible and green public spaces, particularly for women and children, the elderly people and people with disabilities"[14].

The promotion of accessibility is fundamental for people's quality of life and essential for the exercise of equal rights for any member of a democratic society. In this way and as stated in Decree-Law No. 163/06, it contributes to "greater strengthening of social ties, to greater civic participation by all those who are part of it and, consequently, to a growing deepening of solidarity in the welfare state of law" [1].

In this Decree-Law[1], it is also implied that the opening of establishments intended for the public, such as schools, health or commercial establishments,

among others, is licensed by the competent authorities, when these comply with accessibility standards. Whenever there are non-conforming situations, which do not respect the required accessibility conditions, these must be mandatorily communicated to the competent authorities for licensing by the City Council, in order to be rejected.

Accessibility shoul be inclusive and universal, so that cities increasingly allow access by citizens, not only for the physical spaces they offer, but also for the public space that must be free from material obstacles.

A better quality of life for people with limited mobility is presented as a civic obligation of all citizens, in improving their responsibilities. Knowing that mobility difficulties affect a wide range of people, 60% in OECD countries[15] are prevented from participating in economic, social and cultural life due to the presence of barriers, is has become urgent to adopt technical solutions that guarantee access to buildings, as well as to all public spaces and transport.

Local authorities play an important role in eliminating barriers, promoting an accessible environment free of architectural barriers, and should increase their performance and no longer limit themselves to the domains of infrastructure and basic equipment[16]. It is therefore essential to create and/or reinforce synergies between public and private entities and the health sector, in a binomial of health promotion and accessibility for people with limited mobility.

Most of the entities do not correspond to the real needs of their population. Public space, buildings and transportation are designed for the average man, of mature age, with strength and full health, according to Leonardo Da Vinci's theory.

Health professionals need to go beyond prevention strategies, promoting health, facilitating the well-being and environment balance, which since the mid-19th century until today, with Florence Nightingale's environmental theory, have being led by nursing[17].

In the context of professional practice, the use of a theoretical nursing framework is essential to support and support nurses' performance, and should therefore be based on the best scientific evidence available[18]. Among the theoretical references, we verify that this science has been questioning itself about environmental issues for two centuries.

Evidence shows that Specialist Nurses in Rehabilitation Nursing identify Afaf Meleis, Dorothea Orem and Callista Roy´s conceptions as the ones that most support their practice[19].

Nurses may become facilitators in the transition processes if their practice is centered on the person and their real needs[20]. The transition to self-care dependence is a transformable factor through the improvement of the person's learning potential. Nurses can and should contribute significantly to both the promotion of self-care and the quality of the transition processes experienced by people, through continuous measures in which the multidisciplinary team should be focused and, where the RN can be an added value, being facilitator of this successful transition process.

Afaf Meleis' theory of transitions defends that individuals go through transitions during their life cycle, and that nurses should be able to recognize these moments and make them healthier[20]. The resources of the community and society are determinants of the transition process and can be either facilitators or inhibitors. Therefore, it is up to the RN to promote the facilitators and to reduce or to eliminate the inhibitors, namely with regard to architectural barriers and the use of adaptive strategies that minimize them.

For Orem, the environment is one of the conditions that affects self-care, that is, all activities of daily living that are performed by the person to maintain their life and well-being[21]. The environment then refers to the external factors that affect self-care; encompasses physical, chemical and biological aspects encompassing the family, culture and community.

The person's ability to engage and adjust to self-care is called self-care action, which can be affected by basic conditioning factors (another concepts described by Orem), such as age, gender, development status, health status, environmental factors (existence of architectural barriers), sociocultural status, family-related aspects and availability and adequacy of resources.

Roy's conceptual model of adaptation defines the individual as an adaptive being, and the nurse's competence is to facilitate access to healthy adaptive responses[22]. This theoretical framework indicates that the stimulus is identified as the element that triggers the response, which may be intrinsic or extrinsic to the person, and includes all conditions, circumstances and influences around the person, or that interfere with the person's development or behavior. The term “environment”, in this reference, defines the set of stimuli that interact with the person. These stimuli can be divided into focal, contextual and residual[23].

The focal stimulus is the most relevant, as it directly confronts the person determining changes; the contextual stimulus is what comes from the person's internal or external environment, with a positive or negative influence on their situation, contributing to the behavior caused by the focal stimulus; and residual stimulus are internal or external environmental factors that have an undetermined effect on the person's behavior[22].

Thus, we verified the relationship between the environment and the behavior of people in their daily lives, their involvement in the community and their social integration[21-22]. Therefore, the contribution of theoretical references in the intervention of the RN towards the elimination of architectural barriers, fostering inclusive environments for people with limited mobility, is denoted.

Alongside the theoretical frameworks, nursing practice is supported by documents that regulate professional practice. Within the scope of the specialization in

Rehabilitation Nursing, the regulation of the specific competences of the RN adds social inclusion to the health promotion already contemplated in the competences of the general care nurse.

In this context, accessibility is relevant within the scope of Specialized Care in Rehabilitation Nursing, being contemplated by the Regulation of Specific Competences of the Specialist Nurse in Rehabilitation Nursing, that states that this professional "enables peolple with a disability, activity limitation and/or restriction of participation for the reintegration and exercise of citizenship" and "promotes mobility, accessibility and social participation" through knowledge of specific legislation, awareness of the community to adopt inclusive practices, identification and elimination of architectural barriers, and may also issue technical-scientific opinions about the structures and social equipment of the community[24].

As described in the Regulation of Quality Standards for Specialized Care in Rehabilitation Nursing, it is the responsibility of RN to develop processes to promote the social inclusion of people with disabilities: “the optimisation of the resources of the customers, family and community to maintain and/or promote the inclusion of people with disabilities, promoting their participation in community life”; “the adoption of positive discrimination strategies for the most fragile customers”; “the involvement of the client, family and community in strategies promoting inclusion”; “the development of strategies promoting the active inclusion of people with disabilities, including housing conditions, improved access to employment, training and educational opportunities”; “the development of anti-stigma campaigns and activities in the media, schools, jobs, or other contexts, in order to promote the integration of people with special needs”[25].

The idea of nurses as leaders of health promotion strategies has also been reinforced by the World Health Organization, which emphasizes the empowerment of nursing to achieve a health and well-being of the world population, through strategies to promote of physical, mental and well-being, coordinated by nurses who have scientific knowledge in their training capable of enabling them to carry out these strategies[26].

Some authors[3] refer that the need for training on the theme of accessibility is recognized, being a potentiality to be considered by public and private entities. They also argue that the RN, given their technical and scientific knowledge, can raise awareness of the impact of architectural barriers on the quality of life of people with mobility impairments, barriers that can often be eliminated with simple measures and propper planning of resources.

The RN make a difference with regard to knowledge of the specific legislation for accessibility, knowing who to turn to if you need to request intervention to eliminate architectural barriers for people with limited mobility in the community, as well as knowledge of the activation process of the responsible means to eliminate architectural barriers. However, as confirmed by several authors[9], these professionals do not differ from others in what concerns the development of some type of intervention in this regard, in their professional practice.

However, it is important to bear in mind that RNs are currently facing new challenges given the evolution of society, which is increasingly complex and multi-dimensional[3].

Given the training and skills mentioned above, it is the responsibility of the RN to promote the development of strong health policies, influencing political, technical and social decisions to promote accessible environments, particularly by raising awareness and training of mayors on the relevance of the elimination of architectural barriers and for respecting and valuing human diversity, for a full social participation of people with mobility impairment. In this context, public and private entities are decisive for the construction of inclusive territories for these people.

One of the RN's interventions, in line with current health policies, is its contribution to increasing the health literacy of the population and, in this specific case, of people with limited mobility and their family caregivers. The greater the knowledge they have regarding their health status and existing resources in the community, the greater their autonomy, self-management of the disease, self-efficacy, assertive use of health services and empowerment[27].

Since one of the main objectives of nursing is to obtain gains in the person's health, an increase in literacy is essential, as it is associated both directly and indirectly with a higher health outcome[28].

The empowerment of the person with limited mobility corroborates the centralization of the person, making them responsible for the health care they receive and for the identification of hindering conditions in their daily lives and for the promotion of inclusive policies. The person with limited mobility can be a passive or active agent, and their active participation is important, placing them at the level of political decision-making, an aspect that should be driven by the RN.

CONCLUSION

Although there is still a significant opportunity for improvement, the theme of accessibility has been playing an increasingly relevant role in the RN's performance in the scope of public and private entities, as a result of an increasingly visible awareness.

Barriers to accessibility undermine equal opportunities, favor discrimination, accentuate prejudice and increase disability, aspects that are more than sufficient to require a systematic intervention from professionals.

The promotion of accessibility is a fundamental element in people's quality of life, being an essential means for exercising of the rights that are conferred to any member of a democratic society, an aspect that reinforces, once again, the need for RN to consider this component within the scope of the design and provision of rehabilitation nursing care.

in order to improvement of accessibility, decision-making centered on the nursing process that demonstrates a holistic and potentially empowering look is crucial for the person with limited mobility and their family caregiver, the community and stakeholders, and particularly for specialist nurses in rehabilitation nursing.

As knowledgeable about the laws and the rehabilitation process, the RN should also intervene in order to increase the literacy of people with disabilities and their families about their condition, in order to promote their autonomy and independence. The empowerment of people with disabilities has become the motto.

Nursing as a scientific discipline targets not only the person, but also the family, the community or the society. Therefore, the RN is the driver and the driver for the integration of the person in their environment, intervening in their autonomy and adaptation to the environment, so that their limitations do not impede the exercise of citizenship.

This theoretical article is relevant, objectively framing the contribution of the RN as preponderant agents and active participants, both in the political-social decision-making process and in facilitating access to healthy adaptive responses of the person with mobility impairments.

In the future, taking into account that this theme will have even greater relevance, it should be given greater value in the training of the RN and the remaining actors, analyzing its contribution to the definition of social policies and the adaptive outcome of the person with conditioned mobility in all their contexts.

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ACESSIBILIDADE DOS EDIFÍCIOS DESTINADOS À PRÁTICA DE DESPORTO NAS PESSOAS COM DEFICIÊNCIA - INTERVENÇÃO DOS/AS ENFERMEIROS/AS ESPECIALISTAS EM REABILITAÇÃO

ACCESIBILIDAD DE EDIFICIOS PARA DEPORTES PARA PERSONAS CON DISCAPACIDAD: INTERVENCIÓN DE ENFERMERAS DE REHABILITACIÓN

ACCESSIBILITY OF SPORT BUILDINGS FOR PEOPLE WITH DISABILITIES - INTERVENTION OF REHABILITATION NURSES

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RESUMO

Enquadramento: O/A enfermeiro/a especialista em enfermagem de reabilitação tem um papel fundamental no envolvimento da pessoa com deficiência em práticas desportivas. O seu papel é intervir em desvios de saúde da pessoa e ainda avaliar as acessibilidades do edificado.

Objetivos: Analisar barreiras arquitetónicas no edificado e analisar as diferenças tendo em conta a tipologia do edifício e a localização dos mesmos.

Metodologia: Paradigma quantitativo de natureza descritiva e transversal. Universo composto por 9 edifícios desportivos públicos dum Município Português. O instrumento de colheita de dados é uma grelha de observação construída a partir da legislação em vigor. O tratamento de dados fez-se com recurso a estatística descritiva simples e qui-quadrado.

Resultados: Existem barreiras arquitetónicas nos edifícios como escadas com degraus e corrimãos inadequados, instalações sanitárias com lavatórios e sanitas sem alturas corretas, entre outras, mas não se verificaram diferenças significativas relativamente às condições de acessibilidade entre edifícios com piscina e com campos nem entre edifícios localizados na cidade ou periferia.

Conclusão: No município em estudo as pessoas com deficiência têm dificuldades de acesso a locais adequados para a prática de algumas atividades desportivas. As/os enfermeiros/as de reabilitação devem avaliar os recintos relativamente às barreiras arquitetónicas para fazer o devido aconselhamento e sensibilização junto da autarquia, a fim de a tornar mais inclusiva.

Descritores: Estruturas de acesso; Exercício; Pessoas com deficiência; Enfermagem em Reabilitação.

RESUMEN

Enmarcado: El enfermero especialista en enfermería de rehabilitación es imprescindible en la participación de la persona con discapacidad en prácticas deportivas. Su papel es intervenir en desvíos de salud de la persona y aún evaluar las accesibilidades del edificado.

Objetivos: Analizar las barreras arquitectónicas y comprobar si la tipología del edificio (con piscina y con campo) el la ubicación de los pueblos (ciudad y periferia) interfiere en las condiciones de accesibilidad.

Metodología: Paradigma cuantitativo de naturaleza descriptiva y transversal. Universo compuesto por 9 edificios deportivos públicos de un Municipio. El instrumento de recolección de datos es una rejilla de observación construida a partir de la legislación vigente. El tratamiento de datos con la estadística descriptiva simple y chi-cuadrada

Resultados: Existen barreras arquitectónicas en los edificios, pero no se observaron diferencias significativas con respecto a las condiciones de accesibilidad entre edificios con piscina y con campos ni entre edificios ubicados en la ciudad o periferia

Conclusión: En el municipio en estudio las personas con discapacidad tienen dificultades de acceso a lugares adecuados para la práctica de algunas actividades deportivas. Las enfermeras de rehabilitación deben evaluar los recintos sobre las barreras arquitectónicas para hacer el debido asesoramiento y sensibilización ante el municipio, a fin de hacerla más inclusiva.

Palabras clave: Estructuras de Acceso; Ejercicio; Personas con Discapacidad; Enfermería en Rehabilitación.

ABSTRACT

Background: The specialist nurse in rehabilitation nursing is essential in the involvement of people with disabilities in sports practices. Their role is to intervene in deviations of health of the person and to evaluate the accessibility of the building.

Objectives: To analyze architectural barriers in the building and to analyze the differences taking into account the typology of the building and their location.

Methodology: Quantitative paradigm of descriptive and transversal nature. A universe composed of 9 public sports buildings of a Portuguese Municipality. The data collection instrument is an observation grid built from the legislation in force. The data treatment was carried out using simple descriptive statistics and chi-square.

Results: There are architectural barriers in buildings, such as stairs with inadequate steps and handrails, sanitary facilities with washbasins and toilets without correct heights, among others, but there were no significant differences regarding the accessibility conditions between buildings with swimming pools and with courts or between buildings located in the city or suburbs.

Conclusion: In the municipality under study, people with disabilities have difficulty accessing suitable places to practice some sports activities. Rehabilitation nurses should evaluate the enclosures in relation to architectural barriers to make proper counseling and sensitization to the local authority in order to make it more inclusive.

Descriptors: Architectural Accessibility; Exercise; Disabled Persons; Rehabilitation Nursing.

INTRODUCTION

The rehabilitation nurse, in their practice, aim at ensuring that clients achieve their maximum health potential and, to this end, they shouold identify the architectural barriers that influence accessibility and social participation and the full exercise of citizenship, cooperate with community structures, aiming to promote a safe environment for the population in general and for the population with special needs and the promotion of measures aimed at preventing disability or minimizing its impact[1].

The specialist nurse in rehabilitation nursing can lead new spaces of intervention and actively promote citizenship through a social practice and contribute to social development, becoming an important strategy of social inclusion, thus becoming great inducers of of social change with critical awareness and worldview, innovative strategies, projects or social organizations that create new methodologies of social intervention[2].

The specialist nurse in rehabilitation incorporates in their care practice results from scientific research and good practice guidelines based on scientific evidence which are considered to be fundamental instruments with the aim of promoting continuous improvement in the quality of professional practice and quality of care provided[3].

The person, the target of the care of the rehabilitation specialist nurse, can be in any of the phases of the life cycle and the care provided is intended to promote: their health project in relation to the prevention of risks of change in functionality that circumscribe activity limitations or disabilities; the re-adaptation processes whenever functionality impairments occur; the capacity for self-care of the person with special needs or disabilities[3].

In addition to the maximum health potential, the rehabilitation specialist nurse intends to promote the social inclusion of people with disabilities, enabling the community to respect and integrate people with disabilities, identifying situations which contribute to the stigmatization of people with disabilities, optimizing the resources of the person, family and community to promote inclusion in the community, adopting positive discrimination strategies and strategies promoting active inclusion, including housing conditions, improved access to employment, training and educational opportunities and developing anti-stigma campaigns to promote the integration of people with special needs[3].

Having the awareness that rehabilitation encompasses a large number of dimensions, understood as a process, and that it goes beyond what is the recovery of lost functions, it can be said that it is a specialty, in the health area, in which the central focus is the person who is in constant interaction with society and their environment and it is therefore not possible to intervene without realizing the whole environment, being an integral part of the principles of rehabilitation, promoting the involvement of the person and their family in the planning and implementation of care that aims to maximize the capacity for self-care[4].

For the results of the interventions to be positive, it is also necessary that the entire multidisciplinary team to collaborate and, essentially, involve the family and society in this process in order to be able to develop skills, improve functionality, satisfy the person's daily routines, reintegrate the family and socially and promoting the exercise of citizenship and greater autonomy[4].

As far as the community is concerned, it is essential to be committed to working with it, showing attention, dedication, listening and helping to improve the quality of life in a humane way[5].

For nurses, the environment has played a key role since the time of the precursor Florence Nightingale, due to her Environmental Theory, which is based on the notion that it is essential to control the environmentwhere the person is inserted, as we are always in interaction with the environment in which we operate, thus, we must integrate ecological practices, taking local attitudes that aim at global repercussions[6].

Regular involvement with sports practice is a relevant factor for all people and, for that, it is important to be monitored by a health professional[7]. The rehabilitation specialist nurse can be responsible for this follow-up as one of the competencies is to design and implement motor and cardiorespiratory training programs[3].

Sport for people with disabilities or adapted sport is the physical activity that promotes the integration of all people with disabilities into society and the state is responsible for adopting specific measures to ensure the accessibility of buildings intended for this practice[8].

In our country there are about one million people with disabilities and sport is a way of integrating these citizens into society, in this sense, several international events have already been held in Portugal, of different modalities, in order to enhance the involvement in these practices[8]. We leave from here to a municipality where this study will be carried out.

Method: This study fits into the quantitative paradigm and is descriptive, cross-sectional.

The selection criteria for the building were being public and sports buildings. Exclusion criteria: buildings under construction and/or granted to private entities. The sample is composed of 9 sports buildings out of a total of 14 existing ones. Data were collected through an observation grid based on current legislation.

In order to operationalize the variables, we proceeded to the verification of the fulfilment of the specifications in the Decree-Law 163/2006, codifying with 1 for the “yes” indicator, 2 for the “no” indicator and 3 for the “doesn't exist” indicator and the adaptation of the accessibility classification[8] through the following codification: 1 - not accessible: physical barriers are difficult or impossible to overcome; 2 - accessible only with assistance: the route or service is only possible with the help of a third person; 3 - accessible with difficulty: includes accessibility conditions close to those required, even if it is not accessible; 4 - accessible without difficulty: all accessibility conditions are guaranteed for people with reduced mobility; 5 - not applicable or does not exist.

The observation grid built from current legislation is composed of three parts: overall characterization of the interior of the public buildings, characterization of the sports venues and characterization of the sanitary facilities.

This study is part of the +Saúde Famalicão project, in which the Porto College of Nursing and the Municipality are partners, with authorization to carry out its implementation and technical monitoring in data collection.

RESULTS

Regarding the atriums of public buildings and according to Table 1, it was found that it is possible to perform a 360º rotation maneuver without difficulty in 88.9% of the external side of the entrance door and in 77.8%, this same maneuver, of the internal side of the atriums.

Dimension	Indicator	N	%
360° rotation maneuver on the external side of the entrance doors	It’s not accessible.	0	0.0
	It’s accessible only with help.	0	0.0
	It’s accessible with difficulty.	0	0.0
	It’s accessible without difficulty.	8	88.9
	It’s not applicable/It does not exist	1	11.1
360º rotation maneuver on the internal side of the entrance doors	It is not accessible.	0	0.0
	It is accessible only with help.	0	0.0
	It is accessible with difficulty.	1	11.1
	It is accessible without difficulty.	7	77.8
	It is not applicable/it does not exist	1	11.1

Table 1 - Description of the "atriums" category of the variable: accessibility inside sports buildings

With regard to the routes in the building, only 11.1% have an accessible route to the entrance doors, 33.3% to service areas (such as the fields and pool tanks) and 55.6% to the sanitary facilities (Table 2).

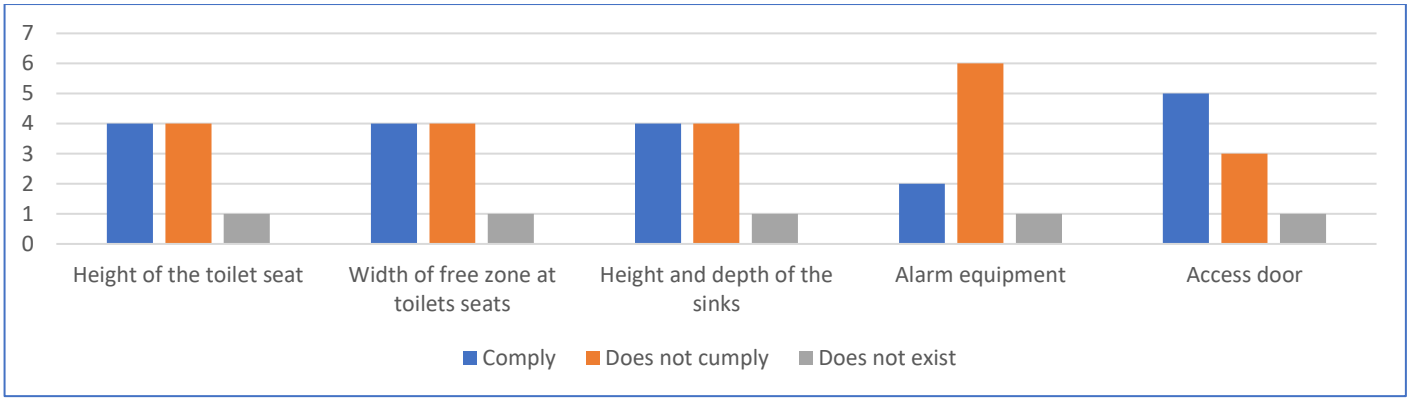
Dimension	Indicator	N	%
Entrance doors	It’s not accessible.	0	0.0
	It’s accessible only with help.	4	44.4
	It’s accessible with difficulty.	3	33.3
	It is accessible without difficulty.	1	11.1
	It is not applicable/it does not exist	1	11.1
Service zone	It’s not accessible.	0	0.0
	It’s accessible only with help.	4	44.4
	It’s accessible with difficulty.	1	11.1
	It is accessible without difficulty.	3	33.3

	Não aplicável/ Não existe	1	11.1
Sanitary facilities	It's not accessible.	1	11.1
	It's accessible only with help.	1	11.1
	It's accessible with difficulty.	1	11.1
	It is accessible without difficulty.	5	55.6
	It is not applicable/it does not exist	1	11.1

Table 2 - Description of the "paths" category of the variable: accessibility inside sports buildings

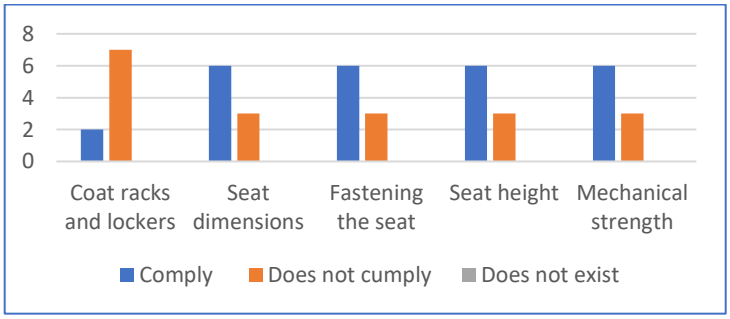
The landings, galleries and corridors in 77.8% of the buildings are not less than 1.2 meters wide.

Buildings with stairs that overcome unevenness above 0.4m should have handrails on both sides, these handrails are at a height between 0.85m and 0.9m and be continuous along the various flights of stairs. However, in our study, this set of conditions did not apply to any of the buildings.



Graph 1 - Description of the "sanitary facilities" category of the variable: compliance with legislation on sports buildings

Regarding the sanitary facilities in the buildings, 44.4% had: toilets with the edge above the height of 0.45m; accessible sinks with a free area not less than 0.7 m wide, with a height of not less than 0.65 m and a depth measured from the front edge of not less than 0.5 m; mirrors placed over the sinks with adequate height. Only 22.2% had alarm equipment and 55.6% had access to the sanitary installation with a sliding or hinged door opening outwards (Graph 1).



Graph 2 - Description of the "sanitary facilities" category of the variable: compliance with legislation on sports buildings

The changing rooms had in 22.2% at least one set of accessible coat racks and lockers, 66.7% a bench fixed to the wall with dimensions of 0.40m by 0.80m, with a floor height of 0.45m and mechanical resistance (Graph 2)

Out of the total number of sports buildings with a swimming pool (four), only 25% had access to the water via a ramp, 50% had double handrails for access to the water and 100% had non-slip coating and finishing of the swimming pool edges. The access steps and other elements in the pool are rounded.

None of the buildings had the minimum number of spaces specially designed for people in wheelchairs and those that did, although below, were not distributed in various parts of the room, nor were they located next to at least one place for a companion.

After analyzing the descriptive statistics, we verified the possible existence of significant differences between the sports buildings located in the center of the municipality or in the periphery was verified. Of the sports buildings, 44.4% are located in the center and 55.6% are located in the periphery. There are no significant differences in buildings that are located in the center or periphery.

We also checked the possible existence of significant differences between sports buildings with swimming pool and those that only have a field for sports activities. Out of the sports buildings, 44.4% are made up of a swimming pool and 55.6% are composed of a field. There are no significant differences in these buildings.

DISCUSSION

In quantitative studies, the results offer various interpretive opportunities, and it is therefore essential to carefully reflect on the possible meanings found in the numbers[10]. That said, it is now necessary to compare and even compare the results that it was possible to obtain by referring to works and/or theories previously carried out on the subject[11].

In each of the spaces evaluated, according to Decree-Law 163/2006[12], there should be at least one route

that is accessible, safe and comfortable for people with reduced mobility; however, it is possible to verify that in these buildings the reality is 11.1% with accessible access to the entrance doors, 33.3% to the service areas (such as the fields and swimming pool tanks) and 55.6% to the toilets.

Stairs are also integrated into accessible paths since there are people with reduced mobility who use them[13]. However, in none of the buildings assessed is the set of conditions necessary to be able to affirm that the stairs are accessible are met.

With regard to the sanitary facilities, it was found that the toilet is not at a height of 0.45m in 55.6%, a value higher than that of another study which found that 35% of the sanitary facilities are not at the proper height[14].

In addition to the height of the toilets, it was also found that 44.4% of the buildings had sinks at a height of 0.80m. This data is lower than the value found by researchers Gallo, Orso and Fiório, in 2011, where 76.92% of the sinks were suspended between 0.78 m to 0.80 m[15].

The changing rooms of the sports venues are an essential place to prepare the person for the activity they are going to perform and the inadequacy of the height of the different equipment found there is identified as one of the problems[16]. Another essential structure in the changing rooms is the hangers and lockers. However, it was found that in the evaluated spas only 22.2% have an accessible set of lockers and hangers. Also in a study of accessibility of sports venues carried out in Oeiras, it was found that in 23% of the venues did not contain lockers and in 43% did not contain accessible hangers[17].

The practice of sport for citizens with disabilities is highlighted in the Basic Law for the Prevention and Rehabilitation and Integration of People with Disabilities[18]. This practice, if the disabled person wants to use the swimming pools, will quickly find difficulties, as of the four sports buildings with swimming pools, only 25% (one) has access to water by ramp, which prevents them from being able to transfer to the tank independently if they are wheelchair users. Only 50% had double handrails for access to water, which is also difficult for those with reduced mobility.

People with disabilities have, in addition to the transversal rights of all, the right to accessibility to the venue as a spectator[19]. Although it was possible to verify that 22.2% of the buildings had places specially destined for the stay of people with disabilities, none of the buildings had the minimum number of places specially destined; and those that presented, even if below, were not distributed in several parts of the room, they were together with at least one place for a companion.

In view of these results, it is up to the Nurse Specialist in Rehabilitation Nursing to find alternative solutions for places that have less accessibility conditions and manage the counseling of sports practices taking into account the characteristics of the buildings and that each person with reduced mobility attends or attended these spaces before the event that determined the disability situation.

CONCLUSION

The rehabilitation nurse has the skills to assess architectural barriers and it is essential to do this before making the recommendation of places for the person to attend. The results showed that nurses, before advising people with reduced mobility on sports activities or accompanying the person in exercise training, have to assess the buildings destined for these practices.

The conditions of places intended for the practice of sports activities and sanitary facilities demonstrate the need for increased work for the rehabilitation nurse, considering that in addition to advising the people they care for, they will have to train them in less favorable conditions for engage in sporting activities.

The assessment of buildings covers not only architectural barriers but also the type of sport it allows to be practiced, so that, together with the person with a disability, adequate counseling is provided in view of their mobility limitations, but also in relation to sport that the person intends to practice.

Once this assessment has been made, it is up to the nurse specialist in rehabilitation nursing the mission of presenting technical-scientific opinions based on the sports structures and social facilities of the community, as well as raising the awareness of political decision-makers for respect for equality in accessibility to practices of healthy lifestyles.

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DOCUMENTAÇÃO DOS CUIDADOS DE ENFERMAGEM DURANTE O PROCESSO DE MORRER - COMO SE DIFERENCIAM OS ENFERMEIROS DE REABILITAÇÃO?

¿DOCUMENTACIÓN DE LOS CUIDADOS DE ENFERMERÍA DURANTE EL PROCESO DE MUERTE - CÓMO SE DIFERENCIAN LOS ENFERMEROS DE REHABILITACIÓN?

NURSING CARE DOCUMENTATION DURING THE DYING PROCESS - HOW DO THE REHABILITATION NURSES DIFFER?

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RESUMO

Objetivo: analisar os focos/diagnósticos de enfermagem documentados pelos enfermeiros especialistas em enfermagem de reabilitação, durante o processo de morrer em contexto hospitalar.

Método: estudo descritivo, retrospetivo e quantitativo realizado numa instituição hospitalar do norte de Portugal em fevereiro de 2017. Os dados sobre a documentação dos focos/diagnósticos de enfermagem identificados nos clientes que morreram no ano de 2016 foram recolhidos por meio de dois sistemas de informação: SClínico e BICUcare.

Resultados: nos 4115 registos efetuados por 148 enfermeiros especialistas em enfermagem de reabilitação, constatamos que apesar da evolução ocorrida durante a última década, na documentação dos cuidados de enfermagem, sobressaem algumas inquietações sobre qual a prática de cuidados que a mesma evidencia. Decorrente da ênfase colocada na documentação das alterações no domínio da função, os enfermeiros especialistas em enfermagem de reabilitação tendem a subestimar o registo das alterações e das necessidades que emergem das transições vivenciadas pelas pessoas, especificamente durante a morte e os processos de morrer.

Conclusão: Atendendo a que a informação registada contribui para a visibilidade dos cuidados prestados, emerge a necessidade de se adotarem estratégias que resolvam o problema da subdocumentação, nomeadamente perante a morte e os processos de morrer.

Descritores: Morte; Enfermagem; Enfermagem em Reabilitação; Registros Eletrónicos de Saúde; Diagnóstico de Enfermagem

RESUMEN

Objetivo: analizar los focos / diagnósticos de enfermería documentados por enfermeras especializadas en enfermería de rehabilitación durante el proceso de muerte en un contexto hospitalario.

Método: estudio descriptivo, retrospectivo y cuantitativo realizado en un hospital del norte de Portugal en febrero de 2017. Los datos sobre la documentación de brotes de enfermería / diagnósticos identificados en clientes que fallecieron en 2016 se obtuvieron mediante dos sistemas de información. : SClínico y BICUcare.

Resultados: De los 4115 registros realizados por 148 enfermeras especializadas en enfermería de rehabilitación, descubrimos que a pesar de la evolución que se ha producido durante la última década en la documentación de la atención de enfermería, existen algunas preocupaciones sobre lo que muestra la práctica de atención. Debido al énfasis puesto en documentar los cambios en el campo de la función, las enfermeras especializadas en enfermería de rehabilitación tienden a subestimar el registro de cambios y necesidades que surgen de las transiciones experimentadas por las personas, específicamente durante los procesos de muerte y muerte.

Conclusión: Dado que la información registrada contribuye a la visibilidad de la atención brindada, es necesario adoptar estrategias que resuelvan el problema de la subdocumentación, particularmente frente a los procesos de muerte y muerte.

Palabras llave: Muerte; Enfermería; Enfermería de rehabilitación; Registros de salud electrónicos; Diagnóstico de enfermería

ABSTRACT

Objective: To analyze the nursing focuses/diagnoses documented by rehabilitation nurses during the process of dying in a hospital context.

Method: it is a descriptive, retrospective and quantitative study conducted at a hospital in northern Portugal in February 2017. The data on documentation of nursing outbreaks/diagnoses identified in clients who died in 2016 were collected using two information systems: SClinic and BICUcare.

Results: From the 4,115 records made by 148 specialist nurses in rehabilitation nursing, we found that despite the evolution that has taken place over the last decade in the documentation of nursing care, some concerns stand out about that practice of care. Due to the emphasis placed on documenting changes in the field of function, specialist nurses in rehabilitation nursing tend to underestimate the record of changes and needs that emerge from the transitions experienced by people, specifically during death and dying processes.

Conclusion: Given that the information recorded contributes to the visibility of the care provided, there is a need to adopt strategies that solve the problem of underdocumentation, particularly in the face of death and dying processes.

Keywords: Death; Nursing; Rehabilitation Nursing; Electronic Health Records; Nursing Diagnosis.

INTRODUCTION

Every human being carries with him an individual representation of death. This is created by the influence of social life, the media and the particularities of each individual. "It is in this scenario of diversity regarding death that nursing professionals find themselves, living in constant challenge, as they remain in conflict on a daily basis, fighting for life and against death, taking upon themselves the responsibility to save, cure or alleviate, always seeking to preserve life, since death, in most cases, is seen by these professionals as a failure, being, in this way, harshly fought"[1:42].

We are creating more and more subspecialties that try to more or less artificially prolong the beauty and the vital functions and postpone this moment which, despite all our commitment and efforts, remains unsurpassed. "Consequently, this extension implies the need for differentiated care, based on valuing the quality of life and the biopsychosocial and spiritual well-being of the patient, aiming to direct health care and, in particular, nursing, through an holistic and integral vision, revealing a "humanized care" [2:318].

Health professionals in general and nurses in particular, are empowered to help others to solve their problems, to promote health and to encourage healthy lifestyle habits. In fact, they are not prepared to accept that there are limits that they will not always be able to treat and restore health to the sick person, so they have to invest in their well-being. And if the aforementioned is notorious in general care nurses, we wonder if it will also be the case for specialist nurses.

According to the Regulation of Common Skills of Specialist Nurses[3], there are four areas of competence: professional, ethical and legal responsibility; continuous quality improvement; management of care and development of professional learning.

Within the scope of the problem under study, in the field of professional, ethical and legal responsibility, we emphasize that specialist nurses should promote care practices that respect human rights and professional responsibilities, namely in situations that are potentially compromising for clients. As an evaluation criteria, we highlight respect for values, customs, spiritual beliefs, as well as for the specific practices of individuals and groups in all phases of the life cycle[3].

According to the same regulation, the nurse acts proactively promoting the appropriate involvement for well-being and managing the risk, for quality improvement by considering the management of the person-centered environment as an essential condition for therapeutic effectiveness and for the prevention of incidents. Regarding the evaluation criteria, we highlight sensitivity, awareness and respect for the spiritual needs of the individual/group and the involvement of the family and others in order to ensure that cultural and spiritual needs are met[3].

Within the scope of the specific competences of the Specialist Nurse in Rehabilitation Nursing[4], we emphasize the fact that specialist nurses take care of people with Specific needs, throughout their entire life cycle, in all contexts of care practice.

Thus, assuming that the professional practice of nurses specializing in rehabilitation nursing must be supported by instruments that regulate professional practice, as well as by theoretical nursing frameworks[5], we question the visibility of this area of specialty within the scope of of the records made in the information systems, namely the assistance to people in the process of dying.

It should be noted that prior to the emergence of computerized information systems, nursing records, as they are traditionally named by nurses, were characterized by the use of free text in order to produce narratives of the care provided, whose interest was limited to the production of documents with legal value[6]. Nowadays, as a result of the observed evolution, despite the notorious quality of the records, do they reflect in all situations the care provided within the scope of specialization in rehabilitation nursing?

Based on this concern, integrated in the broader research project "Living Death: a challenge for the nursing profession", we pose the following question: Does the documentation carried out by specialist nurses in rehabilitation nursing express their practice during death and the process of dying?

In line with the above, the objective of this study was to analyze the nursing focuses/diagnoses documented by specialist nurses in rehabilitation nursing, in caring for people in the face of death and the processes of dying.

METHOD

Descriptive, retrospective and quantitative study, carried out in the departments of Medicine, Surgery and Intensive care medicine, of a university hospital in northern Portugal.

The data on the documentation of nursing focuses/diagnoses identified in clients who died in 2016 were collected in February 2017 through two information systems: SCclinical and BICUcare structured based on the International Classification for Nursing Practice (CIPE®) version β2. 36,281 records were analyzed from 1270 nurses. Subsequently, following a non-probabilistic and intentional sampling, 9202 records were analyzed from 320 specialist nurses, of which 4,115 were carried out by 148 specialist nurses in rehabilitation nursing. Exclusion criteria were defined as: records of clients under the age of 18, records without clear identification of the nurse's authorship and records made outside the areas of medicine, surgery and intensive care.

For data treatment, we used the Statistical Package for Social Sciences (SPSS), version 22.0, and according to the nature of the variables and the objectives of the study, we used descriptive statistics.

RESULT

Out of the 320 nurses who have a specialization in nursing and who registered the patients who died, in addition to the predominance of the female gender (65.5%), the specialization in rehabilitation nursing was the one that appeared most frequently: 148 nurses (46 .3%).

The age of nurses with a specialization in rehabilitation nursing varies between 25 and 55 years-old, with an average of 36.8 years-old.

Regarding the services where specialist nurses in rehabilitation nursing work, services from the departments of surgery and medicine were predominant (Table 1). Specialization in medical-surgical nursing was more frequent among nurses who exercised their professional activity in the intensive care medicine department.

Departa-ments / Specialization Area	Surgery		Medicine		Intensive medicine		Total	
	n	%	n	%	n	%	n	%
Specialist nurses in rehabilitation nursing	37	56.1	64	52.5	47	35.6	148	46.3

***Table 1** – Distribution of Specialist Nurses in Rehabilitation Nursing in the Departments*

The distribution of records relating to the Individual focuses made by nurses with specialization in rehabilitation nursing (RN) is explained in Table 2.

Departa-ments / Registered focus for RN	Surgery		Medicine		Intensive Medicine		Total	
	n	%	n	%	n	%	n	%
Individual	560	55.1	2165	53.4	1390	33.6	4115	44.7

***Table 2** – Registers of Specialist Nurses in Rehabilitation Nursing under the Individual Focus*

Regarding the Function focus, 2408 (43.0%) records were made by nurses with specialization in rehabilitation nursing, distributed by the three areas, as shown in Table 3.

Departa-ments / Registered focus for RN	Surgery		Medicine		Intensive Medicine		Total	
	n	%	n	%	n	%	n	%
Function	286	53.8	1126	57.0	996	32.2	2408	43.0

***Table 3** – Registers of Specialist Nurses in Rehabilitation Nursing under the Focus Function*

The distribution of records relating to the areas of attention assigned to the Function focus can be analyzed in Chart 1. We emphasize that there are four focuses (Physical Development, Metabolism, Nutrition and Repair) without any record.

The reduced number of records of nurses with different specializations, in the services of the departments of medicine and surgery, prevents the carrying out of any statistical test, as in fact, in these two areas there are almost only records of nurses specializing in rehabilitation nursing. It is only possible to observe the distribution of electronic records of nurses holding different specializations in the departments of medicine and surgery is very similar, clearly distinguishing it from the distribution of the intensive care medicine department. In fact, in this last department, the specialization in Medical-Surgical Nursing has greater representation, with the opposite happening with Rehabilitation Nursing. It should be noted that in this study the remaining specializations are almost meaningless.

Departa-ments / Function	Surgery		Medicine		Intensive Medicine		Total	
	n	%	n	%	n	%	n	%
Motor Activity	63	92.6	276	95.8	149	46.1	488	71.9
Circulation	7	53.8	12	36.4	49	28.0	68	30.8
Physical Development	0	----	0	----	0	----	0	----
Digestion	6	66.7	41	77.4	28	33.3	75	51.4
Elimination	8	72.7	13	41.9	82	28.2	103	30.9
Metabolism	0	----	0	----	0	----	0	----
Nutrition	0	----	0	----	0	----	0	----
Repair	0	----	0	----	0	----	0	----
Breathing	64	84.2	259	77.3	145	36.3	468	57.4
Sensations	15	32.6	16	28.1	79	26.5	110	27.4
Immunity system	1	100.0	1	20.0	0	0.0	2	20.0
Integument	111	40.8	488	44.4	446	30.7	1045	37.0
Body temperature	6	46.2	6	28.6	6	31.6	18	34.0
Volume of Liquids	5	26.3	14	29.2	12	25.0	31	27.0

Chart 1 *– Registers of Specialist Nurses in Rehabilitation Nursing within the focus assigned to the Function*

The records relating to the **Integument focus** made by specialist nurses in rehabilitation nursing are the most frequent in the services of the departments of medicine (488 records - 44.4%), intensive care (446 records - 30.7%) and surgery (111 records - 40.8%).

The registers in relation to the **Motor Activity focus**, carried out by specialist nurses in rehabilitation nursing are also one of the majorities, noting the existence of 488 registers (71.9%). The largest number of these records is in the services of the department of medicine (276 records - 95.8%).

The records made by **specialist nurses in rehabilitation nursing** are still high in the case of the Breathing (468 records - 57.4%), Sensation (110 records - 57.4%), Elimination (103 records - 30.9) outbreaks %) and Digestion (75 records - 51.4%). With regard to the Breathing focus, nurses with specialization in rehabilitation nursing and who work in services in the department of medicine are the ones who register most in this area of care (259 records - 77.3%).

In the **Circulation focus**, the records made by specialist nurses in rehabilitation nursing were 68 (30.8%). Of these 68 records, 49 were made in the intensive care department.

The distribution of records related to the focus Volume of fluids performed by specialist nurses in rehabilitation nursing corresponds to only 31 records (27.0%). Regarding the focus Body temperature, specialist nurses in rehabilitation nursing made 18 records (34.0%). Regarding the distribution of records made by specialist nurses in rehabilitation nursing in relation to the Immune System focus, we found there is only one record in the Surgical area and another in the Medical area.

As for the records related to the **Person** (Table 4), according to the areas of specialization, specialist nurses in rehabilitation nursing are the ones with the highest number of records (1707 records - 47.4%), namely in the services of the department of medicine.

Departa-ments / Registered focus for RN	Surgery		Medicine		Intensive medicine		Total	
	n	%	n	%	n	%	n	%
Person	274	56.6	1039	50.0	394	38.0	1707	47.4

Table 4 *– Registers of Specialist Nurses in Rehabilitation Nursing under the Person Focus*

The records related to the **Focus Action** (Table 5) made by specialist nurses in rehabilitation nursing were 1618 (46.7%).

Departa-ments / Registered focus for RN	Surgery		Medicine		Intensive medicine		Total	
	n	%	n	%	n	%	n	%
Action	258	56.2	987	49.4	373	37.1	1618	46.7

Table 5 *– Registers of Specialist Nurses in Rehabilitation Nursing under the Focus Action*

In the distribution of records related to the **Interdependent Action focus**, the records of specialist nurses in rehabilitation nursing (Table 6) are the majority (48 records - 75.0%)

Departa-ments / Registered focus for RN	Surgery		Medicine		Intensive medicine		Total	
	n	%	n	%	n	%	n	%
Interdependent action	3	60.0	44	78.6	1	33.3	48	75.0

Table 6 *– Registers of Specialist Nurses in Rehabilitation Nursing under the Interdependent Action Focus*

The records of the different focuses corresponding to the **Interdependent Action area** can be analyzed in Chart 2.

It should be noted that the records relating to the **Communication focus** (8 records - 72.7%), **Role Interaction** (9 records - 52.9%) and **Social Interaction** (31 records - 86.1%) are mostly made by specialist nurses in rehabilitation nursing. No records were identified regarding the Sexual Interaction focus, nor the Care Provider focus.

Departa-ments / Registered focus for RN	Surgery		Medicine		Intensive medicine		Total	
	n	%	n	%	n	%	n	%
Communication	0	-----	7	77.8	1	50,0	8	72.7
Role Interaction	3	100.0	6	46.2	0	0,0	9	52.9
Sexual interaction	0	------	0	------	0	-----	0	-----
Social interaction	0	------	31	91.2	0	------	31	86.1
Providing care	0	------	0	------	0	-----	0	-----

***Chart 2** – Records of Specialist Nurses in Rehabilitation Nursing within the focus of Interdependent Action*

Regarding the records made by nurses regarding the focus **Action Performed by the Self**, according to the areas of specialization, specialist nurses in rehabilitation nursing are the ones with the highest number of records (1570 records - 46.2%). Chart 3 shows the areas of attention in relation to the focus Action Performed by the Self.

With regard to records made in the context of Self-care, according to the areas of specialization, specialist nurses in rehabilitation nursing are the ones with the highest number of records (1570 records - 46.2%).

Regarding the **Lifestyles focus**, none of the nurses with specialization in nursing made records, with only 6 records made by general care nurses.

Departa-ments / Registered focus for RN	Surgery		Medicine		Intensive medicine		Total	
	n	%	n	%	n	%	n	%
Selfcare	255	56,2	943	48.5	372	37.1	1570	46.2
Homecare	0	------	0	------	0	-----	0	-----
Lifestyle	0	------	0	------	0	-----	0	-----

***Chart 3** – Records of Specialist Nurses in Rehabilitation Nursing in the different focuses assigned to the Action performed by the Self*

Regarding the area of self-care attention (Chart 4), the records of specialist nurses in rehabilitation nursing are essentially directed to the focuses of **Physical Activity** (533 records - 55.5%), **Self-care** (271 records - 17.3%), **Use of toilets** (225 records - 43.1%), **Hygiene** (218 records - 40.7%), **Clothing** (188 records - 39.5%) and **Personal Care** (130 records - 38.1%). Regarding the **Health Seeking Behavior** focus, there were 4 records and 1 record in the **Sleep-Rest Behavior** focus.

Departa-mentos / Registered focus for RN	Cirurgia		Medicina		Medicina Intensiva		Total	
	n	%	n	%	n	%	n	%
Self-care	28	11,0	106	11,2	137	36,8	271	17,3
Personal arrangement	5	1.9	68	7.2	57	15.3	130	38.1
Drinking	0	0,0	0	-----	0	-----	0	0.0
Sleep-rest behavior	0	-----	1	0.10	0	-----	1	50.0
Hygiene	27	10.6	124	13.1	67	18.0	218	40.7
Use of the toilet	40	15.7	128	13.6	57	15.3	225	43.1
Clothing	28	11.0	116	12.3	44	11.8	188	39.5
Physical activity	125	49.0	398	42.2	10	2.7	533	55.5
Recreational activity	0	-----	0	-----	0	-----	0	-----
Self-aggression	0	-----	0	-----	0	-----	0	-----
Health seeking behavior	2	0.78	2	0.21	0	----	4	40.0

***Chart 4** – Registers of Specialist Nurses in Rehabilitation Nursing in the different focuses related to Self-Care*

Within the scope of the documentation carried out in relation to the **Reason for Action focus**, according to the areas of specialization, specialist nurses in rehabilitation nursing are the ones with the highest number of records (89 records - 65.9%), namely in the domain of Self- knowledge. The only record related to Self-concept, made by a specialist nurse in rehabilitation nursing, refers to Self-esteem.

Regarding Self-knowledge (Chart 5), according to the areas of specialization, specialist nurses in rehabilitation nursing are the ones with the highest number of records (88 records or 65.7%). Regarding the distribution of records made, according to specialization areas, for specialist nurses in rehabilitation nursing, the main focus was **Memory** (26 records - 57.8%), **Adaptation** (23 records - 71.9%), **Energy** (22 records - 64.7%) and **Cognition** (15 records - 88.5%).

Departa-ments / Registered focus for RN	Surgery		Medicine		Intensive Medicine		Total	
	n	%	n	%	n	%	n	%
Adaptation	0	0.0	23	85.2	0	----	23	71.9
Learning	0	----	0	----	0	----	0	----
Welfare	0	----	0	----	0	----	0	----
Cognition	0	----	1	100.0	14	87.5	15	88.2
Belief	0	----	0	----	0	----	0	----
Emotion	0	----	2	33.3	0	----	2	33.3
Energy	2	100.0	17	63.0	3	60.0	22	64.7
Willpower	0	----	0	----	0	----	0	----
Memory	13	76.5	9	56.3	4	33.3	26	57.8
Decision making	0	----	0	----	0	----	0	----

***Chart 5** – Records of Specialist Nurses in Rehabilitation Nursing in the different focuses assigned to the Reason for Action - Self-knowledge*

Regarding the distribution of records made regarding the **Emotion focus**, according to the areas of specialization, Mental Health and Psychiatric Nursing is the most frequent (3 records - 50.0%), followed by **Rehabilitation Nursing**, with 2 records (33.3%) performed in the Medical area.

Regarding the distribution of records related to **Willpower**, nurses with specialization made only 1 record, which was carried out by a nurse with specialization in Mental Health and Psychiatric Nursing.

Regarding the **Learning, Well-being, Belief** and **Decision Making** focuses, there were no records of any of the areas of specialization

DISCUSSION

The use of electronically supported information systems has increased significantly, a reality to which nursing has not been left out. In the investigations carried out by several authors[6-8], it was possible to verify that the information system favors the guarantee of the continuity of nursing care, as well as its visibility. In an investigation carried out in the hospital context[9], it was found that nurses are aware of the importance of the electronic information system, seeing in its implementation the possibility of giving visibility to the care provided. In this context, it is important to remember that nursing documentation is an essential component, with clinical and legal significance, and a poor documentation standard contributes to a worse quality of care[10].

Despite the advantages of an electronic information system, in order to facilitate communication between institutions and ensure the possibility of comparing nursing data, in 2007, the Nursing Order, considered that one of the basic principles for the development of the nursing system information was the use of the International Classification for Nursing Practice (ICNP®) as a language reference[11].

Information systems have been seen as an instrument to facilitate research in nursing. In relation to the above, it has been considered that, in addition to constituting a strategic resource for management, the possibility of reusing the data documented in the information systems, in the form of sensitive indicators for nursing care, paves the way for the consolidation of the role and the importance of nurses[12] and, particularly, specialist nurses in rehabilitation nursing. For this, it will be necessary, first of all, to solve the problem of under-documentation of nursing care[12], and in this particular case, of rehabilitation nursing. The identification of some factors that may justify this under-documentation can contribute to the adoption of strategies that culminate in the optimization of the information system in use.

In this sense and in the context of a study carried out in the national context[13], five factors emerged that condition the valuation of electronic information systems: inequalities between institutions regarding the updating of the computerized information system; the complexity of the computerized information system; the inadequacy of the computerized information system in some contexts; knowledge of the computerized information system, as well as the time for electronic records.

The idea that there is too much time devoted to documentation continues to prevail among nurses. In an investigation carried out in 2006, it was found that the difficulties inherent in handling computers could increase the time spent, however, with the training of these skills, better time management would be possible[6]. Furthermore, given the current levels of technological literacy, it was thought that the difficulties inherent in handling computers would have little influence[14], which effectively does not always happen.

The problem is that from the perspective of some nurses, regardless of computer technology skills, it is necessary to spend a lot of time on the computer, in order to meet all the requirements inherent in the documentation of planned and provided care. As already mentioned in 2006, “the time nurses spend to document competes with the time available for direct care to clients”[6:18], which often culminates in an under-documentation of care, in this case, rehabilitation nursing.

In this subject, the unavailability of time is also reflected in the lack of updating of the care processes in the computerized system, with changes in status frequently occurring without updating of the other aspects included in the care plan. It is, therefore, notorious that the time spent to carry out nursing records can interfere with their quality[15].

Within the scope of the factors that condition the documentation of nursing care, the appreciation of the documentation of nursing care stands out, as well as the knowledge about the importance of documentation of nursing care[13].

As it was already pointed out in the literature, the challenge is to recognize the importance of the records, as they reflect what was actually performed, with the risk of incurring in the question, "if it is not registered,

then it was not performed"[15:34]. Since the information documented by nurses was used in the study presented here, the question stands out: do specialist nurses in rehabilitation nursing not register the problems and needs of people in the context of death and dying processes, or will it be a less valued area in the scope of your performance?

From the above, the need to clarify the aspects inherent to the informative quality of the documentation emerges in the contexts, since incomplete data mischaracterize the reality, the intervention of health professionals and compromise the adoption of evidence-based strategies[16,17].

As a result of the institutionalization of death, nurses who exercise their professional activity in hospital institutions, such as the nurses who participated in this study, are often faced with the need to care for people in the process of dying and the studies that have been carried out in these contexts show that they do not always feel prepared, since the academy trains professionals with theoretical and practical support to preserve life, and the issues of death and dying are hardly addressed[18-22]. The problem is that the superficiality and trivialization of the few discussions about death and the process of dying have not allowed the expansion of the understanding of this phenomenon as an integral event of the life cycle[19].

Following the above and given the results obtained in this study, it is emerging that nurses defocus from a practice predominantly dedicated on meeting basic human needs, in favor of a care centered on the experiences lived by people in the face of the imminence and inevitability finitude of life, with the potential to culminate in a dignified and peaceful death[23].

When analyzing the records, according to the areas of specialization, specialist nurses in rehabilitation nursing are the ones with the highest number of records in the scope of the "Person" and the "Action performed by the Self", which shows, once again, the value attributed by these specialist nurses to each person's individual project.

The documentation carried out in the scope of the function shows that despite the value attributed to the person's domain, specialist nurses in rehabilitation nursing give special focus to three areas of care: integument, motor activity and breathing.

Given the characteristics of the professional practice of specialist nurses in rehabilitation nursing, the focus on the integument is perfectly integrated in the prevention of complications. On the other hand, the performance centered on motor activity and breathing, show the contribution of the specialist nurse in rehabilitation nursing in maximizing the person's potential, and for this purpose, they conceive, implement and monitor differentiated rehabilitation nursing plans, based on the real and potential problems of people in three essential components: motor, neurological and cardiorespiratory.

Since the care provided in the context of death and dying processes needs to be anchored in theoretical nursing frameworks[23], from the results related to the focus “Reason for action” emerges the need to rethink practices. In fact, the absence of records in the scope of learning, well-being, belief and willpower, crucial in the scope of some of the theoretical nursing frameworks, highlights the need for the design and respective documentation of care to contemplate these areas, which are essential during the experience of transitions. In addition, the inclusion of these areas of care will ensure that nurses are able to recognize not only the biological aspects, which are highly focused on the function, but also the psychosocial and spiritual implications of the experience of death and the processes of dying in patients, families and in family caregivers[23].

CONCLUSION

Hospital institutions have undergone significant changes, aiming either at satisfy customer needs or at the quality of the service provided. Due to these requirements, the correct documentation of customer problems and needs is essential to the success of any organization.

However, despite the relevance currently attributed to the documentation of rehabilitation nursing care, there are some weaknesses, especially relating to the updating of the care process. In fact, despite identifying the problems and needs of clients in the context of death and dying processes, they are not always registered, which raises doubts as to their implementation.

Although it is known that the performance of nurses is not always congruent with the theoretical frameworks of the discipline and with the instruments that regulate professional practice, several studies have shown that what is performed is significantly higher than what is recorded. In view of the above, in addition to the documentation carried out by nurses being crucial, it would be interesting to carry out qualitative studies in order to identify the factors that facilitate or compromise a congruent performance with the regulatory instruments of the profession and with the theoretical frameworks of the discipline and/or on the other hand, compromise the documentation of what was planned and executed. It would be equally interesting, although not within the scope of the project “Living death: a challenge for the nursing profession”, to compare these results with the records made by specialist nurses in rehabilitation nursing on other clients.

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IMPACTO DA INTERVENÇÃO DO ENFERMEIRO DE REABILITAÇÃO À PESSOA COM DOENÇA PULMONAR OBSTRUTIVA CRÓNICA – REVISÃO SISTEMÁTICA

IMPACTO DE LA INTERVENCIÓN DEL ENFERMERO DE REHABILITACIÓN A LA PERSONA CON ENFERMEDAD PULMONAR OBSTRUCTIVA CRÓNICA - REVISIÓN SISTEMÁTICA

IMPACT OF THE REHABILITATION NURSE'S INTERVENTION ON THE PERSON WITH CHRONIC OBSTRUCTIVE PULMONARY DISEASE - SYSTEMATIC REVIEW

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RESUMO

Introdução: A Doença Pulmonar Obstrutiva Crónica é prevenível e tratável, com manifestações respiratórias persistentes, nas quais as intervenções do ER podem contribuir para melhorar a capacidade funcional e emocional, o conhecimento, promover o autocuidado, a adesão ao regime terapêutico e a comportamentos saudáveis.

Objetivo: Sintetizar evidência científica sobre impacto da intervenção do ER na Pessoa com DPOC.

Métodos: Estabeleceu-se como pergunta de investigação "Qual o impacto da intervenção do Enfermeiro de Reabilitação na Pessoa com Doença Pulmonar Obstrutiva Crónica?", adotando-se a metodologia do The Joanna Briggs Institute para revisão sistemática. Definiram-se critérios de inclusão e a pesquisa booleana, na EBSCOhost.

Resultados: Incluíram-se 6 artigos, que retratam a componente educacional e suporte do ER. O ER tem impacto positivo na vida da pessoa com DPOC, verificando-se melhores resultados no controlo sintomático/dispneia, na redução das admissões e tempo de internamento, no aumento da perceção da doença e da qualidade de vida. Tem impacto na melhoria das atividades de vida diária e na redução dos custos.

Conclusões: Os estudos evidenciaram variedade nas formas de atuação do ER, mas impacto positivo associado. Salienta-se pouca investigação sobre resultados das intervenções.

Descritores: Doença Pulmonar Obstrutiva Crónica. Enfermagem de Reabilitação. Reabilitação Respiratória

RESUMEN

Introducción: la enfermedad pulmonar obstructiva crónica es prevenible y tratable, con manifestaciones respiratorias y limitación del flujo de aire, en la cual las intervenciones de ER pueden contribuir a mejorar la capacidad funcional y emocional, el conocimiento, promover el autocuidado, el cumplimiento del régimen terapéutico y los comportamientos saludables.

Objetivo General: Sintetizar la evidencia cientifica sobre el impacto del ER en la Persona con EPOC.

Métodos: Se estableció como pregunta de investigación "¿Cuál es el impacto de la intervención del Enfermero de Rehabilitación en la persona con con Enfermedad Pulmonar Obstructiva Crónica?", Se adoptó la metodología del Instituto Joanna Briggs para la revisión sistemática. Se definieron criterios de inclusión y la como investigación booleana, en la base EBSCOhost.

Resultados: Incluimos 6 artículos, que retratan e el componente educativo y de apoyo de la ER. El ER tiene un impacto positivo en la vida de la persona com EPOC, com mejores resultados en términos de control sintomático/disnea, en la reducción de las admisiones y tiempo de internamiento, en el aumento de la percepción del control de la enfermedad y de la calidad de vida. Tiene impacto en la mejora de las actividades de vida diaria y en la reducción de los costos.

Conclusiones: Los estudios evidenciaron variedad en las formas de actuación del ER, pero impacto positivo. Se destaca la escasa investigación sobre los resultados de las intervenciones.

Palabras clave: Enfermedad Pulmonar Obstructiva Crónica. Enfermería en Rehabilitación. Rehabilitación Respiratoria

ABSTRACT

Introdution: The Chronic Obstructive Pulmonary Disease (COPD) is preventable and treatable with respiratory manifestations and airflow limitation, in which intervention can contribute to improve functional and emotional capacity, knowledge, to promote self-care, adherence to the therapeutic regimen and healthy behaviors.

General Objective: To synthesize scientific evidence of the impact of the Rehabilitation Nurses (RN) intervention on the person with COPD.

Methods: It was established as a research question "What is the impact of the Rehabilitation Nurse intervention on a person with Chronic Obstructive Pulmonary Disease?" adopting The Joanna Briggs Institute methodology for systematic review. The inclusion criteria were defined, and it was defined a Boolean research in the EBSCOhost database.

Results: We included 6 articles, which mainly portrayed the educational and support component of the RN. The RN has a positive impact on the life of the person with COPD, with better results in terms of symptomatic control/dyspnea, on the reduction of admissions and length of hospitalization, increased awareness of disease control and quality of life. It has an impact on improving daily life activities and reducing costs.

Conclusions: The studies evidenced many ways of performance of the RN with positive impact. There is little research on the results of interventions.

Keywords: Pulmonary Disease, Chronic Obstructive. Rehabilitation Nursing. Respiratory Rehabilitation.

INTRODUCTION

Chronic Obstructive Pulmonary Disease (COPD) is a preventable and treatable disease, which is characterized by persistent respiratory manifestations and airflow limitation, due to significant exposure to harmful particles/gases[1]. COPD is responsible for high expenses for society, having a considerable economic impact, which is determined from the direct costs (diagnosis and treatment) and the indirect costs (consequences of the disabilities caused by COPD such as losses due to disability, absenteeism , premature mortality and benefits payment)[2]. It is a fact that Portugal is part of the group of countries with the lowest mortality from COPD, with a rate of 8.0% (630 people)[3]. However, in 2016, COPD was responsible for 7,864 admissions, being present in 1,963 people undergoing non-invasive ventilation. In 2016, it accounted for 7.0% of admissions for respiratory causes, being surpassed by admissions for pneumonia and respiratory failure. This translates into a considerable social and economic burden for the country, as mentioned above. In other words, it translates into considerable direct and indirect costs with (re)hospitalizations and complications, which could be avoided by resorting to the rehabilitation of people with COPD. For this reason, in Portugal, by 2020, it is intended to reduce by 10% (compared to 2014) the admissions due to respiratory causes (including COPD), which can be prevented or treated in health centers[4].

One of the strategies is the implementation of respiratory rehabilitation programs, that is, the adoption of an intervention based on the person's assessment, followed by personalized therapies that include training and exercise, education, behavioral changes and adherence/management of good-promoting behaviors[1]. This makes sense when realizes that it brings benefits to people with COPD, having been shown to be the most effective therapeutic strategy in stable people, being responsible for several gains such as: reduction of hospitalizations (among people who have had recent exacerbations), improvement of dyspnea, improved exercise tolerance, symptomatic control or improved quality of life[1]. In the same perspective, at the national level, the need and importance of Respiratory Rehabilitation in people with COPD was clarified, emphasizing the gains that can be obtained, such as the improvement of dyspnea and quality, as well as the reduction of hospitalization days[5]. Respiratory rehabilitation should be seen as a global and multidisciplinary intervention, and should be individualized and encompassing effort training, psychosocial intervention, with a view to symptoms reducing, optimizing functionality, increasing social participation and reducing costs. Thus, the rehabilitation team must be composed of a pulmonologist, physiatrist, physiotherapist, psychologist, nutritionist, social worker and, inevitably, the Rehabilitation Nurse[5].

In view of the above, the intervention of the Rehabilitation Nurse in the rehabilitation process of the person with COPD is essential. In fact, it is described that the Rehabilitation Nurse must act at the level of therapeutic optimization (checking and correcting the inhalation technique and the most appropriate inhalation device), education of the person/family and functional respiratory re-education, training and exercise[6]. Regarding the educational component, the Rehabilitation Nurse must focus on the needs of the person/family, seeking to demystify COPD and focusing on the need for exercise, smoking cessation, adoption of techniques of energy conservation or aspects related to feeding. In turn, functional respiratory reeducation should be a component of the Rehabilitation Nurse's respiratory rehabilitation program, including breathing exercises, awareness of breathing times, (re)learning of diaphragmatic breathing and expiration with semi-closed lips. Likewise, the training of respiratory muscles, upper and lower limbs should be a concern of the Rehabilitation Nurse[6].

In light of the above, the College of Rehabilitation Nursing Specialty identified as one of the priority areas of investigation in the short term, the study about the impact of interventions by the Rehabilitation Nurse[7].

It is important to understand the effect of the intervention of the Rehabilitation Nurse on the person with COPD and the gains that result from that. Thus, it is necessary to prepare a systematic review of literature that aims to achieve the following objective: to synthesize the evidence on the impact

that the intervention of the Rehabilitation Nurse has on the person with COPD. To this purpose, the following research question was defined as a starting point: What is the impact of the intervention of the Rehabilitation Nurse on the person with COPD?

METHOD

This manuscript is a systematic literature review. For its purpose, the steps and recommendations of the Joanna Briggs Institute were adopted as a methodological framework[8]. For the construction of the research question and for the identification of the key concepts, the PICO method (Population, Intervention, Comparison and Results)[8] was used, as shown in Table 1.

P	Population	Person with Chronic Obstructive Pulmonary Disease	Key-concepts: - *Cchronic obstructive pulmonar disease* *and* - *Impact* *and* *-Nurse*
I	Intervention	Intervention of the Rehabilitation nurse	
C	Comparison	If there is one.	
O	Results	Arising from the interventions of the RN in any context	

***Table 1** - Identification of key concepts through PICO mnemonic.*

Source: it was adapted by the authors based on The Joanna Briggs Institute (2011)

With the PICO method, inclusion and exclusion criteria were defined, and listed in table 2.

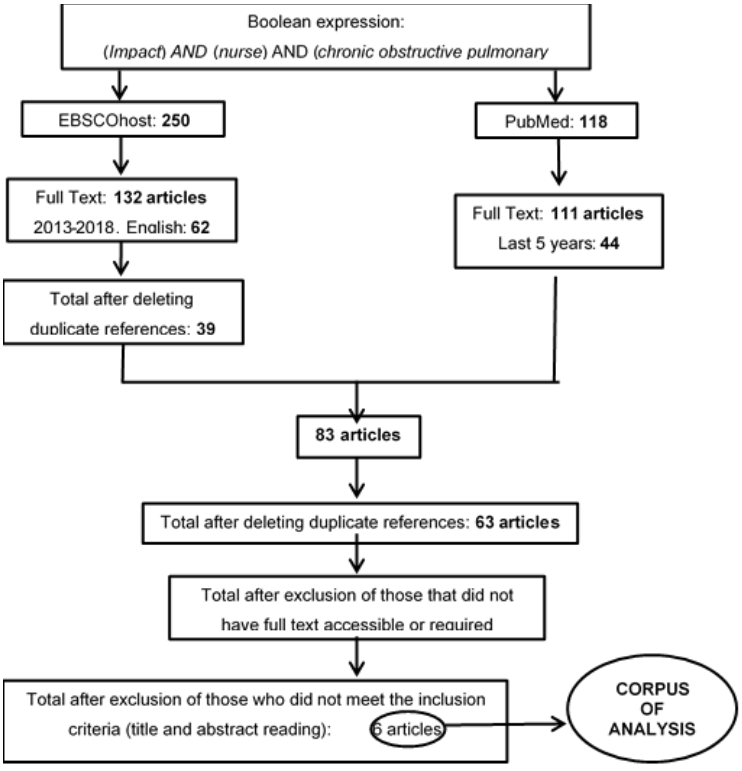
It should be noted that the choice of the publication period (last 5 years) was linked to the fact that the temporal updating of the references is one of the crucial points of its scientific rigor, intending to synthesize the most current evidence on the impact of the rehabilitation. At the same time, this limit is justified by the fact that concern about the impact of the rehabilitation nurse has emerged in recent years.

According to the systematic review purpose, it was defined as a Boolean expression (impact) AND (nurse) AND (chronic obstructive pulmonary disease). In April 2018, an electronic search was carried out in the EBSCOhost database (at CINAHL Plus, at MEDLINE, Academic Search Complete, Business Source Complete, MedicaLatina, Chrocrane Central Register of Controlled Trials), obtaining 250 articles. The 'Full Text' option (132 articles) was selected, within the 2013-2018 time limit, in English (there were no articles available in Portuguese), leaving 62 articles. Of these, duplicate articles were eliminated (by the database itself), resulting in 39 articles. At the same time, a new search was carried out in PubMed, with the same Boolean search (118 articles). 'Full text' (111 articles) and the time limit of the last 5 years were selected, leaving 44 articles. Also at PubMed there was no production of articles in Portuguese.

Selection criteria	Inclusion criteria	Exclusion criteria
Type of participants	Person with Chronic Obstructive Pulmonary Disease	Person with another pathology
Type of intervention	Intervention of the Rehabilitation nurse	What does not refer only to the intervention of the Rehabilitation Nurse
Type of results	Arising from intervention in any context	-----
Type of studies	Quantitative or qualitative research studies	Mixed, non-scientific and no-database abstract studies
Date of publishing	Between 2013-2018	Before 2013
Language	English or Portuguese	Another language, which is not English or Portuguese.

Table 2. Definition of Inclusion and Exclusion criteria

Out of the 83 articles in the 2 databases, duplicate references[20] were eliminated, leaving 63 articles. Articles who did not have a full text or required subscription were eliminated[17], leaving 46 articles. This was followed by reading title and abstract, in order to verify compliance with the inclusion criteria. 40 articles were excluded as they did not met the criteria, and 6 articles constituted the body of analysis, as shown in Flowchart 1.



Flowchart 1 - Identification of the Analysis Corpus

Methodological Quality Assessment

After obtaining 6 studies, which were part of the analysis body, there was an assessment of the methodological quality. For the evaluation of 4 articles, we used the Meta-Analysis of Statistics Assessment and Review Instrument critical appraisal tools Randomized Control/Pseudo-Randomized Trial, with 10 criteria[8]. For the evaluation of the other 2 articles, we used the Meta Analysis of Statistics Assessment and Review Instrument critical appraisal tools Descriptive/Case Series Studies with 9 criteria[6]. Table 3 shows that all studies with scores equal to or greater than 70% of the criteria (score equal to or greater than 7) were included, maintaining an analysis body of 6 articles. Table 3 also demonstrates the assessment of the levels of evidence for each article, according to Joanna Briggs Institute Levels of Evidence[8].

Studies	Instrument used	Ponctuation	Evidence Level
Champion, R., Hall, T., & Tori, K. (2015). Home oxygen therapy assessment for COPD patients discharged from hospital: Respiratory NP Model of Care.	*Meta Analysis of Statistics Assessment and Review Instrument critical appraisal tools Randomized Control/Pseudo-Randomized Trial*	8 / 10	E2
Kim, J., Park, E.-C., & Han, K.-T. (2016). Nurse Staffing and 30-day Readmission of Chronic Obstructive Pulmonary Disease Patients: A 10-year Retrospective Study of Patient Hospitalization.		7 / 10	E2
Bilington, J., Coster, S., Murrells, T., & Norman, I. (2015). Evaluation of a Nurse-Led Educational Telephone Intervention to Support Self-Management of Patients With Chronic Obstructive Pulmonary Disease: A Randomized Feasibility Study.		10 / 10	F1
Weldam, S. W., Schuurmans, M. J., Zanen, P., Heijmans, M. J., Sachs, A. P., & Lammers, J.-W. J. (2017). The effectiveness of a nurse-led illness perception intervention in COPD patients: a cluster randomised trial in primary care.		9 / 10	E1
Duangubpha, S., Hanucharurnkul, S., Pookboonmee, R., Orathai, P., & Kiatboonri, C. (April-June de 2013). Chronic Care Model Implementation and Outcomes among Patients with COPD in Care Teams with and without Advanced Practice Nurses.	*Meta Analysis of Statistics Assessment and Review Instrument critical appraisal tools Descriptive/Case Series Studies*	7 / 9	E1
Cox, K., Macleod, S. C., Sim, C. J., Jones, A. W., & Trueman, J. (2017). Avoiding hospital admission in COPD impact of a specialist nursing team.		7 / 9	E2

Table 3. Assessment of Methodological Quality and Study Evidence Level

RESULTADOS

After the methodological evaluation, the data extraction and synthesis were performed.

Some authors developed a study that aimed to assess the effectiveness of the nurse's intervention (Respiratory Nurse), in the context of primary health care[9]. They implemented a type of intervention, the Chronic Obstructive Pulmonary Disease-Guidance, Research on Illness Perception (COPD-GRIP). The authors performed a randomized controlled trial conducted in 30 general community practice settings and 5 home care centers in the Netherlands during 6 weeks of intervention and 9 months of follow-up. The study recruited 204 people with COPD, differentiating them into 2 groups: a control group (consisting of 101 people) and an intervention group (consisting of 103 people)[9].

In the intervention group, the COPD-GRIP was applied to each participant. This consisted of 3 extra consultations, lasting 30 minutes, 3 weeks apart. In the first consultation, the nurse addressed the perceptions of the person with COPD about the disease, using the Brief Illness Perception Questionnaire. Later, on the 2nd consultation, the relationship between the person's perceptions and the behavior was discussed, being invited to prepare the person´s own care plan. In the last consultation, the actions, perceptions and behaviors that the person with COPD changed were evaluated. After the implementation of the intervention, the results were analyzed using a mixed linear model[9].

The first study concluded that there was a change in the COPD Clinical Questionnaire after 9 months of intervention. At the same time, the intervention contributed to changes in the level of perceptions about COPD, in terms of quality of life related to health, in terms of activities of daily living and in terms of health education. In the intervention group, there was a significant increase in health-related behavior at 6 weeks ($p = 0.024$) and in personal control ($p = 0.005$) at 9 months. Still, there was no significant change between the control and intervention groups at 9 months.

Thus, the authors concluded that the COPD-GRIP intervention did not improve the health status of people with COPD at the primary care level. However, the intervention brought benefits by improving the ability to control disease and health-related behaviors in the short term[9].

The second study was carried out in Lincolnshire and aimed to assess the safety and effectiveness of a specialized acute respiratory assessment service for people with COPD, led by nurses (Respiratory Nurse Specialist)[10]. The authors analyzed the case notes, referring to people who had been referred to the unit, during a period of 12 months. Simultaneously, the application and analysis of questionnaires (on a Likert scale) was carried out in order to assess satisfaction with the service[10].

In this study, there were 128 patients with COPD, with acute exacerbation and who needed support to prevent hospitalization. These patients were forwarded to community nurses specialized in respiratory nursing. The specialized service included an initial respiratory assessment, developed by a nurse specialized in respiratory nursing (medical history, medication, inhalation technique, physical examination, objective assessments of temperature, heart rate, respiratory rate, blood pressure and arterial blood gas). It was followed by a discussion with each person with COPD, where a personalized plan was developed. Participants were monitored at home and by telephone (up to 14 days, depending on severity and need for support)[10].

The authors concluded that the respiratory nursing specialist can serve as an articulation and reference element for people with COPD to other services (e.g., occupational therapy, physiotherapy, social care, day hospital, smoking cessation programs, pulmonary rehabilitation programs)[10]. Consequently, they found that the skills of these specialists were a significant contributor to the success of the service, particularly their abilities to interpret blood gas values and to initiate emergent oxygen delivery as needed.

The authors also found that since the introduction of this type of service, the hospital admission rate has reduced significantly. Even so, they admit that it is difficult to attribute the reduction in admission only to this type of service[10]. Finally, another improvement in this service was the education provided on self-management, since people who took advantage of this type of service became more aware of the services existing in the community. This makes it possible to design adequate self-management plans in helping people with COPD when they look for a treatment at the first sign of disease exacerbation.

The research also attested that specialist nurses play a key role in avoiding hospital admissions, being able to care for people safely and effectively and being able to prescribe treatments that, if they're managed by generalist nurses, would require hospital admission[10].

This is followed by a third study, developed in Korea, which aimed to assess the association between the level of nursing teams and the readmission rate of people with COPD[11]. For this, they analyzed national health data from 2002 to 2012 and used a model equation to associate readmission to nurses (in Korea there are Registered Nurses or Certified Nursing Assistants). 1,070 hospitals participated and 339,379 cases of hospitalalizaton of people with COPD were studied. The authors divided the number of nurses by 100 beds and distinguished it into three groups according to the proportion of nurses: Group 1 (low), Group 2 (moderate), Group 3 (high). Subsequently, they identified the dates of the 1st hospitalization and discharge, followed by verification of the existence of readmission within a period of 30 days, each one being considered as a new hospitalization (after the 1st discharge).

The authors considered the variables of the person with COPD (main diagnosis, age, gender, respiratory distress, comorbidities, duration of oxygen therapy, length of stay in an intensive care unit,) and the characteristics of the hospital (structural, human resources, type of institution, number of beds)[11].

In this study, the results showed remarkable positive effects of nurses on the person with COPD. However, the magnitude of this impact differed depending on the size of hospitals. In fact, there was an increase in readmissions in hospitals with reduced numbers of nurses (more readmissions in group 1 than in group 3). Thus, a higher number of nurses per 100 beds was significantly associated with lower readmission rates (when compared to a lower number of nurses)[11].

Despite what was described, the authors recognized that the study had some limitations, such as not evaluating other characteristics of the person with COPD that could affect readmission (education, socioeconomic status, disease severity, current medical treatment, use of other health services, home visits...), the inability to assess the effects of specialist physicians on readmission, as well as changes in human resources (such as the turnover rate of nurses)[11].

Another study, resultant from the review carried out, aimed to assess whether a supportive intervention, via telephone, would increase the person's well-being and reduce the severity of symptoms, in the primary health context in London. This study aimed to: determine the feasibility of the study, the intervention, to determine the secondary effects of the intervention and its costs[12].

For this, the authors designed a randomized study with 2 groups (control and intervention) and applied the Chronic Obstructive Assessment Tool (CAT) questionnaires. A total of 71 people with COPD, living in the community, and followed up in a primary care setting participated (34 people in the intervention group and 35 in the control group). The Intervention group received the same treatment as the control group, having participated in an intervention for an additional 6 weeks. During this period, people in the intervention group were contacted twice (in the 3rd and 5th week) by an advanced nurse practitioner. Each call lasted about 25 minutes and addressed the following issues: living with the condition, use of the action plan for symptoms, use of medication, encouragement, and provision of support.

In addition, the nurse analyzed the information needed for self-management and answered questions about the self-management plan, symptom management and starting emergency medication. The nurse also assessed the person's self-perception of

their health, and suggested clinical visits when necessary. At the same time, the nurse evaluated all medical reports at the time of the telephone intervention, and used open questions in order to promote discussion[12].

To measure the results, the authors assessed the impact on symptoms through the CAT (at the beginning and at the end of 12 weeks), the number of self-reported exacerbations and the satisfaction with the service. In the intervention group, the CAT score decreased significantly, showing improvement between time 1 and time 2. In the control group, there were no changes. In the CAT score, there was a significant difference between the two groups, in the 2nd moment. However, there were no significant changes with regard to exacerbations in the second moment, as well as with regard to satisfaction (which did not differ significantly between the two groups). The authors concluded that the nursing intervention via telephone is valid, in the context of primary health care, and can help to improve people's health and well-being[12].

In turn, other researchers developed a study in Victoria, Australia, which aimed to: assess the impact of the introduction of a model of care (with advanced nurse practitioner in chronic respiratory disease - Chronic Respiratory Disease Nurse Practitioner, at the level of appreciation) of short-term oxygen therapy, in the provision of care and in the results for the person with COPD[11]. They carried out an uncontrolled retrospective study, through clinical audits, which were conducted in 2 moments (pre and post introduction of the model of care, in 2009 and 2011 respectively)[13].

301 people with COPD and acute respiratory infection/exacerbation participated in the study, and the data were collected from medical reports. The data collected were: oxygen saturation (48h before discharge), collection of arterial blood gas (48h before discharge) in cases of saturations less or equal to 90%, existence or not of functional gait test and oxygen saturations lower or equal to 88% (48 hours before discharge), eligibility of the person to receive short-term oxygen therapy, existence of recommendation for short-term oxygen therapy (at discharge) and existence of readmission, within 28 days, with a diagnosis associated with COPD[13].

The results revealed the existence of a significant increase in people evaluated with arterial blood gas to assess the need for short-term oxygen therapy, from 7.7% (2009) to 45% (2011). The study revealed that the need for short-term oxygen therapy increased from 26.7% to 44.4%[13].

At the same time, hospital readmissions in the 28-day post-discharge period in people with short-term oxygen therapy decreased from 25% to 12.5%. Thus, the authors concluded that, with the introduction of the care model, there was an increase in the number of people assessed for eligibility and receiving short-term oxygen therapy, a reduction in hospital readmissions, an improvement in performance protocols, as well as a improvement in health gains and financial savings for the hospital studied[13].

Lastly, a study carried out in hospitals in Thailand. This study aimed to explore the level of implementation of a care model in a COPD program and compare the difference in the results of teams without and with advanced nurse practitioner . The authors carried out a comparative descriptive study, through the application of questionnaires, the assessment of respiratory function and the performance of a pilot test (to assess the validity of the instruments)[14].

210 people with COPD participated who, 1 year before, had 80% adherence to COPD consultations and who were able to communicate. Participants were divided into a control group, which was cared for by teams without advanced nurse practitioner (105 people), and an intervention group, which was cared for by teams with advanced nurse practitioner (105 people)[14].

In the form of an interview, the authors applied the questionnaires in the following order: Personal Information Questionnaire, Self-Care Behaviors Questionnaire, Health-Related Quality of Life Questionnaire and Satisfaction with Care Questionnaire. They continued with the performance of the 6-minute walk test and respiratory function tests. Subsequently, they reviewed the number of visits to the emergency room, hospital admissions, length of stay and health care costs (recorded in medical reports) for the last year. Also during the process, the team's professionals were invited to jointly respond to the Assessment of Chronic Illness Care[14].

The study revealed that the intervention group had higher self-care behaviors and lung function, as well as lower hospital stay and health care costs. At the same time, the authors found that advanced nurses practitioner can lead and support multidisciplinary teams, by educating and developing skills that enable people to perform appropriate self-care (e.g., accurate use of inhalers, promotion of physical exercise and breathing adequate, smoking cessation, early recognition and prevention of exacerbations...)[14].

In addition, advanced nurse practitioner have integrated other components of the model, using clinical guidelines and providing effective care (through care planning, consultations, home visits and case management). The articulation of advanced nurses practitioner with community resources and with the other team members also enabled the creation of productive interactions, with the objective of functional improvement and the improvement of the person's quality of life. A positive example was the action of an advanced nurse practitioner, who developed a blow bottle to help people perform breathing exercises, facilitating their self-care, their knowledge about the disease and lung function. Finally, the study revealed that the intervention of these nurses in COPD programs resulted in gains, namely in the improvement of lung function/self-care

behaviors and in the reduction of costs with services and the length of stay[14].

DISCUSSION

The studies used showed a multiplicity in the ways in which the Rehabilitation Nurse works, namely COPD-GRIP, telephone intervention, models of care with respiratory nursing or the assessment of the need for short-term oxygen therapy. Even so, whatever the form of action, there was a preference for conducting randomized controlled studies (with intervention and control groups). This is in line with the literature, which highlights the comparison of results between people undergoing respiratory rehabilitation programs and people not undergoing them[15-16].

The results showed agreement on the impact in terms of the reduction of hospital (re)admissions[10-11,13], the increase in the perception of disease control and the surrounding environment[9-11,14]. At the same time, studies have shown a direct relationship between the role of the RN and the reduction in hospitalization time and financial burden for health institutions[13-14].

Thus, the results obtained seem to be in agreement with some authors. In fact, in a study, which sought to estimate the cost of exacerbations of people with COPD undergoing a Pulmonary Rehabilitation Program, the authors found that a longer stay in the program was directly related to a reduction in the number and severity of exacerbations, as well as in cost reduction[2].

In addition to the above, the results corroborate a study, where the authors, when comparing 2 groups (with and without the intervention of the rehabilitation nurse) concluded that the group that received the intervention of the rehabilitation nurse obtained gains in the two main dimensions of the SF Health Questionnaire-36, in physical performance, general health and vitality[15].

Comparing the results obtained with the state of the art, there was an agreement in the improvement of activity tolerance and quality of life. However, only one study was found to be in agreement with the improvement in dyspnea[17].

It is important to emphasize that although few countries have specialist nurses in rehabilitation nursing (with the same specific skills as the one legislated in the Portuguese context), many have advanced nurses in the field of chronic respiratory disease. These experts ("respiratory nurses") have training, knowledge and clinical experience, performing similar interventions in approaching people with COPD. In fact, the articles analyzed highlight the specialized "look" of rehabilitation nurses towards the person. This is in line with the literature that recognizes that rehabilitation nurses recognize the impact of context and environment, being essential to manage complex situations and intervene at any stage of life, establishing partnerships with people and communities and coordinating interdisciplinary care plans[18].

Finally, it is noteworthy that the studies converge in certain aspects on the gains of the Rehabilitation Nurse, reflecting on the reality of some contexts. Still, it is noteworthy that little research exists on intervention outcomes.

CONCLUSION

This systematic review proposed to answer the guiding question "What is the impact of the intervention of the Rehabilitation Nurse on the Person with COPD?", seeking to highlight the results of the intervention of the Rehabilitation Nurse. The studies highlighted diversity in the ways of acting of the Rehabilitation Nurse. The results were consistent with regard to the impact on reducing hospital (re)admissions and increasing disease control.

There was a direct relationship between the performance of the Rehabilitation Nurse and the reduction of hospitalization time and costs for organizations, which may have implications for decision-making by health managers. In addition, the studies converge in some aspects on the gains of the Rehabilitation Nurse, answering the initial question and reflecting on the reality of some health contexts.

This review has, therefore, implications at the level of education, as it demonstrates to students the importance of highlighting effective nursing care. Finally, it is suggested that investigations be carried out on the impact of the Rehabilitation Nurse on adherence to the therapeutic regimen (e.g. inhalation therapy) in people with COPD.

Limitations of systematic literature review

This systematic review has some limitations. The first is related to the limitation of articles to English or Portuguese, as this conditions the appearance of articles published in other languages. Another limitation is the fact that articles were excluded because they did not have a full text or because they require subscription to the journal in question, reducing the number of available articles. Finally, the third limitation is due to the fact that we chose to study the general impact of the Rehabilitation Nurse intervention, which may have excluded interesting evidence on the economic impact for the health institution, for the satisfaction of the person with COPD, or on specific interventions by the Rehabilitation Nurse. However, it is important to emphasize that the objective of this systematic review was never to study the results of specific interventions by the Rehabilitation Nurse, but rather to understand and deepen the impact that their approach and perspective can have on the person with COPD.

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PESO MÁXIMO DA MOCHILA RECOMENDADO PARA CRIANÇAS (6-12 ANOS) EM CONTEXTO ESCOLAR: PROTOCOLO DE *SCOPING REVIEW*

PESO MÁXIMO RECOMENDADO DE LA MOCHILA PARA NIÑOS (6-12 AÑOS) EN EL CONTEXTO ESCOLAR: UN PROTOCOLO DE REVISIÓN DEL ALCANCE

MAXIMUM RECOMMENDED BACKPACK WEIGHT FOR CHILDREN (6-12 YEARS-OLD) IN SCHOOL CONTEXT: A SCOPING REVIEW PROTOCOL

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RESUMO

Contexto: A utilização regular de mochilas escolares apresenta riscos, no período de crescimento da criança. A percentagem de peso da mochila recomendada não é unânime, sendo esta problemática multifatorial, que merece uma revisão de literatura mais aprofundada.

Objetivos: mapear a evidência em relação ao peso máximo da mochila recomendado para crianças dos 6 aos 12 anos em contexto escolar.

Método: sugerido pelo Joanna Briggs Institute. Incluir-se-ão estudos primários em fulltext em língua portuguesa, inglesa e espanhola publicados em bases de dados científicas, diretrizes internacionais e literatura cinzenta. A análise de relevância dos artigos, a extração e síntese dos dados desenvolver-se-á por dois revisores independentes.

Apresentação e discussão dos resultados: os dados extraídos apresentar-se-ão em diagrama PRISMA, permitindo a interpretação e disseminação da evidência disponível.

Conclusão: espera-se que os resultados sintetizem a melhor evidência sobre o peso máximo da mochila recomendado para crianças (6-12 anos) em contexto escolar.

Descritores: criança, suporte de carga, escolas, Serviços de saúde escolar, Enfermagem em Reabilitação

RESUMEN

Contexto: el uso regular de mochilas escolares presenta riesgos durante el crecimiento de un niño. El porcentaje de peso de la mochila recomendada no es unánime, y este problema multifactorial merece una revisión adicional de la literatura.

Objetivos: mapear la evidencia sobre el peso máximo de mochila recomendado para niños de 6 a 12 años en el contexto escolar.

Método: sugerido por el Instituto Joanna Briggs. Se incluirán estudios primarios de texto completo en portugués, inglés y español publicados en bases de datos científicas, guías internacionales y literatura gris. El análisis de la relevancia de los artículos, la extracción y la síntesis de los datos serán desarrollados por dos revisores independientes.

Presentación y discusión de los resultados: los datos extraídos se presentarán en un diagrama PRISMA, permitiendo la interpretación y difusión de la evidencia disponible.

Conclusión: se espera que los resultados resuman la mejor evidencia sobre el peso máximo de mochila recomendado para niños (6 a 12 años) en entornos escolares.

Palavras clave: Niño, Carga de peso, Escuelas, Servicios de salud escolar, Enfermería en Rehabilitación

ABSTRACT

Context: Regular use of school backpacks presents risks during a child's growth period. The weight percentage of the backpack recommended is not unanimous, and this multifactorial problem deserves further literature review.

Objectives: to map the evidence regarding the maximum backpack weight recommended for children from 6 to 12 years-old in school context.

Method: It is suggested by Joanna Briggs Institute. Primary fulltext studies in Portuguese, English and Spanish published in scientific databases, international guidelines and gray literature will be included. The analysis of the relevance of the articles, the extraction and synthesis of the data will be developed by two independent reviewers.

Presentation and discussion of the results: the extracted data will be presented in a PRISMA diagram, allowing the interpretation and dissemination of the available evidence.

Conclusion: The results are expected to summarize the best evidence on the maximum backpack weight recommended for children (6-12 years-old) in school settings.

Keywords: Child, Weight-Bearing, Schools, School Health Services, Rehabilitation Nursing.

INTRODUCTION

The evidence of the existence of degenerative changes in the spine, namely scoliosis, hyperkyphosis and hyperlordosis at various stages of growth, alerts to the importance and urgency of early intervention[2-3], through "School Health" with actions aimed at the school community towards the implementation of health promotion proposals[11].

Thus, it is considered that the school period is essential to work on health from the perspective of its promotion, where the discipline of Nursing, namely the specialist nurse in Rehabilitation, can develop actions for the prevention of diseases and for the strengthening of protective factors.

The National School Health Program (2015-2020) states that musculoskeletal injuries in students result from physical overload associated with excess weight in backpacks, the adoption of incorrect postures and due to inadequate sports activity[4].

The regular use of school backpacks, often heavy and/or unfit, which hold manuals and materials for the entire school day, presents a multiplicity of risks, including postural changes and back pain[1], especially during the period of growth of the child[12-13].

Since 1977, there has been scientific reference regarding the percentage of weight that a child must carry in the school bag, which should not exceed 10% of their body weight, ie, the maximum acceptable limit will be 1/8 of their body weight[5].

Since then, this value has been accepted by the scientific community[12-13], although there are studies that contrast this percentage, suggesting other values, such as 7.4%[6] or even a non-specific interval between 5 and the 15% depending on the child's gender[7], or even mentioning that it is not appropriate to suggest the same backpack weight limit for all children, that is, a single weight limit may not be suitable for all students[8].

Currently, in Portugal it is suggested by the General Directorate for Health that the weight of backpacks, briefcases and similar items and their contents should not exceed 10% of the child's body weight[4].

As seen, the percentage of weight of the recommended school backpack is not unanimous, and this problem involves a multifactorial complexity, transversal to several areas where knowledge about anatomy, biomechanics and pathophysiology of the spine provide ergonomic and postural guidance for the activities of the daily life[4], which should deserve the full attention of the school community and a more in-depth literature review, since after conducting preliminary research at the Joanna Briggs Institute (JBI) Database of Systematic Reviews and Implementation Reports, Cochrane Database of Systematic Reviews, in the Cumulative Index to Nursing and Allied Health Literature (CINAHL) via EBSCO, and in the Medical Literature Analysis and Retrieval System Online (MEDLINE), via PubMed, no literature reviews were found published in this thematic area.

In this sense, it is proposed to carry out this scoping review with the general objective of mapping the evidence in relation to the maximum backpack weight recommended for children aged 6 to 12 years in a school context, seeking to answer the question: what is the maximum backpack weight recommended for children (6-12 years-old) in a school setting?

MÉTHODS

In order to deepen the knowledge on this subject, this scoping review protocol will adopt the methodology suggested by (JBI), described by The JBI Reviewers' Manual[9]. This method is intended to provide a map of the scope of available evidence, when a specific issue is not clear.

Research strategy and identification of studies

Selection criteria will be defined and applied according to the Population, Concept, Context (PCC) methodology:

- Population (P): children aged 6 to 12 years-old, regardless of gender;
- Concept (C): maximum backpack weight recommended for children from 6 to 12 years-old;
- Context (C): Basic education schools (BE) (1st and 2nd cycles of studies), regardless of geographic location and educational system.

As for the types of sources, quantitative primary studies and international guidelines published in databases and gray literature, covering the subject studied, will be included. Only documents in English, Portuguese and Spanish will be considered for inclusion in this review.

In studies with children who present a different age range, studies in which the average age of the participants is less than 13 years-old will be

established as inclusion criteria. As exclusion criteria, opinion articles and news will not be included.

The search strategy will be divided into three stages: first, an initial search will be carried out in the CINAHL, MEDLINE, Mediclatina, Sportdiscus, Academic Searchcomplete databases, via EBSCO Host Online Research Databases, where the words will be analyzed contained in the title, abstract and keywords.

In a second search, the keywords and/or descriptors properly selected will be used: schoolbag OR backpack* AND load* AND safe weight OR load carriage AND child* AND school* NOT adult* NOT adolescen*.

Research will also be carried out in the Scientific Open Access Repository of Portugal (RCAAP).

Finally, a list of all publications found will be created, delimited to the last 5 years, for the sake of human resources and time management. However, to overcome this limitation, care will be taken to analyze the bibliographical references considered relevant to the topic in question, cited by the articles included, without a temporal boundary.

Data Extraction

Data will be extracted from the included articles, by two independent reviewers, using a table-type instrument (Table 1), developed specifically for this review, taking into account specific details about the relevant population, concept, context and research methods for the question and purpose stated in this scoping review, as indicated by the methodology developed by JBI. However, it may be refined during the review process.

ARTICLE ANALIZED	
Reviewer:	Extraction date: __/__/__
Database	
Article Code	Title
Authors	
Year	
Country	
Specialty	
Population/Sample	
Methodology	
Results/Details Recommended backpack weight	
Suggestions/Recommendations Reviewer Comments	
Bibliography cited	

***Table 1** – Data extraction instrument from the analyzed studies. Porto, Portugal, 2018*

Disagreements that may occur between the two reviewers will be resolved, if necessary, by resorting to a third reviewer.

Data Mapping

The extracted data will be presented in the form of a PRISMA diagram (figure 1).

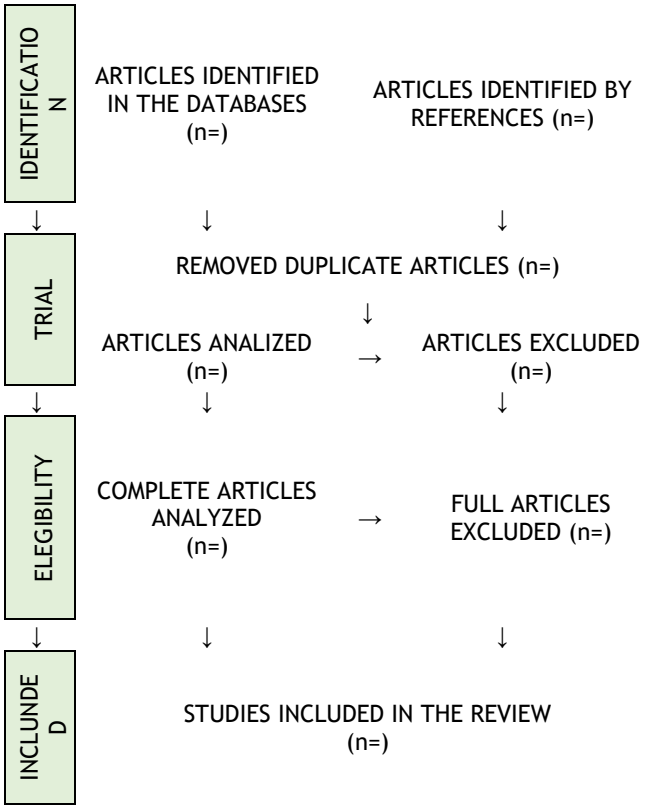

***Figure 1** – PRISMA diagram of the study selection process. Porto, Portugal, 2018*

PRESENTATION AND DISCUSSION OF RESULTS

A narrative summary will accompany the tabulated and/or diagram results and describe how they relate to the objectives and the starting question.

A data presentation table will be developed specifically for this mapping. However, it can be refined during the review process.

The mapping of the maximum recommended backpack weight for children aged 6 to 12 in a school context will contribute to the dissemination of available evidence on the subject.

CONCLUSION

The School, in addition to having a specific pedagogical function, has a social and political nature aimed at transforming society, related to the exercise of citizenship and access to development and learning opportunities, reasons that justify actions aimed at the school community, responding to health promotion needs[10].

Health promotion by specialist nurses in Rehabilitation Nursing in School Health should take as a starting point the real needs of the school population, developing teaching and learning processes that improve academic results, in order to contribute to raising the level of literacy in health and improving the lifestyle of the educational community[4].

With the synthesis of research results, through the scoping review methodology, it will be possible to see the percentage of maximum backpack weight

recommended for children (6-12 years-old) in the school context, in order to promote the incorporation of scientific evidence in professional practice of Nursing, more specifically in the Rehabilitation specialty.

With this literature review, it will allow the future transfer of knowledge by highlighting aspects inherent to the maximum backpack weight recommended for children aged 6 to 12 years-old in a school context, according to the scientific literature on the subject.

As a strategy of differentiation in the promotion of School Health, it is essential to link knowledge from research in clinical practice, so it is expected that this scoping review will constitute a preliminary exercise that justifies the development of systematic reviews on effectiveness of some practices in the promotion of healthy postural habits in the school context.

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REABILITAÇÃO DA FUNÇÃO RESPIRATÓRIA NA PESSOA COM PNEUMONIA BACTERIANA SECUNDÁRIA AO *INFLUENZA* A: ESTUDO DE CASO

REHABILITACIÓN DE LA FUNCIÓN RESPIRATORIA EN LA PERSONA CON NEUMONÍA BACTERIANA SECUNDARIA A LA *INFLUENZA* A: ESTUDIO DE CASO

REHABILITATION OF RESPIRATORY FUNCTION IN PERSON WITH BACTERIAL PNEUMONIA SECONDARY TO *INFLUENZA* A: CASE STUDY

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RESUMO

Introdução: Os meses de Outono e Inverno estão associados a um aumento da epidemia sazonal da gripe responsável por 3 a 5 milhões de casos de doença grave. A sobre-infeção bacteriana secundária assume-se como a complicação mais frequente, com elevados índices de internamento. Aos enfermeiros especialistas em enfermagem de reabilitação são reconhecidas capacidades mediante um conjunto de intervenções terapêuticas para proporcionar a recuperação da pessoa portadora de patologia respiratória.

Objetivo: Identificar os ganhos em saúde sensíveis aos cuidados de enfermagem de reabilitação na otimização da função respiratória numa pessoa com o diagnóstico de pneumonia adquirida na comunidade por streptococcus pneumoniae secundária à infeção por *Influenza* A.

Método: Estudo de abordagem qualitativa, tipo estudo de caso. Consiste na utilização do processo de enfermagem, com recurso ao Padrão Documental dos Cuidados da Especialidade de Enfermagem de Reabilitação. É apresentado o caso de uma pessoa idosa com alteração da função respiratória, necessitando de oxigenoterapia e capacidade de expetorar comprometida. Foram cumpridos os princípios éticos em investigação.

Resultados: Com a implementação do plano de intervenção constituído por quadro dias, foram verificados ganhos na redução da sensação de dispneia; redução do aporte de oxigenoterapia; redução da quantidade de secreções; melhoria na auscultação pulmonar do murmúrio vesicular.

Conclusões: Verifica-se que com a implementação de um plano de cuidados de enfermagem de reabilitação individualizado pode-se contribuir significativamente na promoção da recuperação da pessoa com patologia respiratória restritiva.

Descritores: Exercícios Respiratórios; Pneumonia Bacteriana; Enfermeiro Especialista em Enfermagem de Reabilitação; Relatos de Casos.

RESUMEN

Introducción: Los meses de otoño e invierno están asociados a un aumento de la epidemia estacional de la gripe responsable de 3 a 5 millones de casos de enfermedad grave. La sobre-infección bacteriana secundaria se asume como la complicación más frecuente, con altos índices de internamiento. A los enfermeros especialistas en enfermería de rehabilitación se les reconocen capacidades mediante un conjunto de intervenciones terapéuticas para proporcionar la recuperación de la persona portadora de patología respiratoria.

Objetivo: Identificar los resultados de salud sensibles a los cuidados de enfermería de rehabilitación en la optimización de la función respiratoria en una persona con el diagnóstico de neumonía adquirida en la comunidad por streptococcus pneumoniae secundaria a la infeción por *Influenza* A.

Método: Estudio de enfoque cualitativo, tipo estudio de caso. Consiste en la utilización del proceso de enfermería, con recurso al Padrão Documental dos Cuidados da Especialidade de Enfermagem de Reabilitação. Se presenta el caso de una persona anciana con alteración de la función respiratoria, necesitando de oxigenoterapia y capacidad de expetorar comprometida. Se han cumplido los principios éticos en investigación.

Resultados: Con la implementación del plan de intervención constituido por cuadro días, se verificaron beneficios en la reducción de la sensación de disnea; reducción del aporte de oxigenoterapia; reducción de la cantidad de secreciones; mejora en la auscultación pulmonar del murmullo vesicular.

Conclusiones: Se verifica que con la implementación de un plan de cuidados de enfermería de rehabilitación individualizada se puede contribuir significativamente a la promoción de la recuperación de la persona con patología respiratoria restrictiva.

Descriptores: Ejercicios Respiratorios; Neumonía Bacteriana; Enfermero Especialista en Enfermería em Rehabilitación; Informes de Casos

ABSTRACT

Background: The autumn and winter months are associated with an increase in the seasonal epidemic flu responsible for 3 to 5 million cases of serious illness. Secondary bacterial infection is the most frequent complication, with high hospitalization rates. The rehabilitation nurse is recognized for being specialist in therapeutic interventions to provide the recovery of the person with respiratory pathology.

Objective: To identify health outcomes from rehabilitation nursing care associated with the optimization of the respiratory function in a person diagnosed with streptococcus pneumonia community-acquired pneumonia secondary to *Influenza* A infection.

Method: Qualitative case study research type. The study highlights the nursing care using the Padrão Documental dos Cuidados da Especialidade de Enfermagem de Reabilitação in an elderly person with altered respiratory function is presented, necessitating oxygen therapy and with its ability to expectorate compromised. The ethical principles in research have been fulfilled.

Results: The implementation of the intervention plan constituted by four days revealed a reduction in the sensation of dyspnea; reduction of oxygen therapy; reduction of secretions; improvement in pulmonary auscultation of the vesicular murmur.

Conclusions: It is verified that the implementation of an individualized rehabilitation nursing care plan can contribute significantly to promote the recovery of the person with restrictive respiratory pathology.

Keywords: Breathing Exercises; Bacterial Pneumonia; Rehabilitation Nursing; Case Reports.

INTRODUCTION

Extreme and intense climatic phenomena are currently an increasingly frequent reality, with serious consequences for the health of the population, reflected in the increase in morbidity and mortality experienced in these periods[1]. The autumn and winter months are associated with an increase in the seasonal influenza epidemic, which despite being an acute respiratory disease and mostly benign, in some cases may have a more severe evolution (implying an increase in demand for health services) annually responsible for 3 to 5 million cases of severe disease and for 250,000 to 500,000 deaths worldwide[1,2]. In Portugal, epidemiological surveillance is carried out by the Sentinel Medical Network in collaboration with the National Reference Laboratory for the Influenza Virus and Other Respiratory Viruses in the Department of Epidemiology of the Ricardo Jorge Institute, issuing weekly surveillance bulletins. According to them, for the 2018/2019 season there was an increase in the incidence rate beginning on December 3, 2018, assuming epidemic flu activity between January 21 and 27, 2019, with an incidence rate of 89.3 per 100,000 inhabitants due to the circulation of subtype A[3].

Influenza virus infection, in addition to increasing the risk of exacerbating chronic diseases, presents as the most frequent complication secondary to bacterial overinfection, mainly caused by Streptococcus pneumoniae, Haemophilus Influenzae and *Staphylococcus aureus*[1,4].

Pneumonia is an infection of the lung parenchyma in which all or part of the alveoli are filled with fluid and erythrocytes, conferring the designation of pulmonary consolidation, replacing both the air available in the alveoli and the area available for gas exchange. This is a phenomenon that gives it a restrictive pattern due to the reduction in pulmonary compliance, reflected in an increase in respiratory rate, a reduction in tidal volume and in the ventilation-perfusion index[5].

Pneumonia (n=40345) is assumed in Portugal as the main cause of hospitalization for respiratory disease in 2016, followed by chronic obstructive pulmonary disease (n=7864) and lung cancer (n=5541)[6]. Pneumonia is responsible for 7% of hospital admissions, with an increased prevalence in patients aged 80 years-old and over, with high percentages of morbidity and mortality, the latter being at 20%[6].

Community-acquired pneumonia is one that has its origin in the community or that manifests within 48 hours after the person is hospitalized. Commonly, the person presents with chest pain, fever, dyspnea, cough, initially mucous and progressively purulent sputum, and chills. Pulmonary auscultation is marked by the presence of audible crackling ferns in both breaths, although more intense in the inspiratory phase and often in the posterior phase of the thorax at the level of the middle lung fields, simulating "hair squeezing between the fingers"[7,8]. The presence of consolidations is identified by a hyporesonance to percussion[9] and an increase in the thoraco-vocal shiver on palpation[5].

In situations of hospitalization of a person with community-acquired pneumonia, the person should undergo control by chest teleradiography and arterial blood gas. Chest teleradiography is an essential means of diagnosis in this area, providing information on the lung parenchyma, mediastinum, bone structures and soft tissues[5]. In community-acquired pneumonia, the image of pulmonary consolidation is frequently present in the lower lobes, as well as the presence of a diffuse interstitial infiltrate resulting from the inflammatory process[8]. Arterial blood gas analysis allows the assessment of oxygen concentrations, the effectiveness of gas exchange between the alveoli-capillaries and acid-base balance, being a method for controlling the clinical evolution and determining the need for additional oxygen[5].

Therapeutic treatment of community-acquired pneumonia is based on antibiotic therapy directed at the specific microorganism, and due to the need for an early start, it turns out to be empirical. In addition to antibiotic therapy, this treatment should be complemented with the administration of oxygen, nutritional support and prevention and treatment of possible associated metabolic disorders[7,8]. Inhalation therapy, as the preferred route, is also assumed to be effective in the treatment and prevention of secretion stasis. Given the situation, there is a wide variety of therapies such as saline, bronchodilators, anti-inflammatory drugs, mucolytics and antibiotics, with equal therapeutic effects compared to other routes of drug administration, in addition to a reduction in adverse effects[8].

The rehabilitation nurse (RN) is the health professional who is recognized for the ability to provide a set of therapeutic interventions (with emphasis on non-pharmacological ones) with the aim of improving residual functions, maintaining and recovering independence in life activities and minimize the impact of disabilities in terms of neurological, respiratory, cardiac, orthopedic, impairments and incapacities[10].

In this sense, respiratory rehabilitation, as a holistic process that gives the person a full physical, mental, emotional, social and professional state, has become a standard of care recommended to people with respiratory pathology in its chronicity and/or exacerbation[5], with the RN recognized as having specialized competences in the implementation of respiratory functional re-education programs, also called respiratory kinesitherapy[11].

Currently, it is shown that respiratory rehabilitation reduces the symptoms presented, improving limb muscle function, exercise capacity, emotional function, quality of life, knowledge and self-efficacy, being considered an essential component in the integrated care of patients supported by better cost-effectiveness, reduced hospitalizations and reduced health costs[12].

Respiratory functional re-education is a non-invasive therapy with no harmful adverse effects, encompassing a set of techniques based on breath control, positioning and movement aimed at better efficiency in gas exchange and symptom reduction, complementing the established pharmacological treatments[5, 12].

The intervention of respiratory rehabilitation in people with community-acquired pneumonia is dependent on the stage of the disease, and should be intervened after stabilization of severe hyperthermia and hemodynamic instability. In the initial phase, the intervention aims to reverse the volume reduction in the lung segments and prevent atelectasis and the consequent reduction in the ventilation-perfusion index, while as the disease progresses to its resolution, there is a reduction in the consolidation of lung fields and the occurrence of productive cough with secretions[5,8]. The objective of the RN intervention focuses on optimizing ventilation with lung reexpansion, with special attention to the prevention and correction of postural changes; in the permeability of the airways with the drainage of secretions and promotion of an effective cough; the reduction of respiratory work and effort re-education[5,8].

The intervention of the RN should be based on the initial assessment of the person and the symptoms presented, complemented by imaging and clinical observation[8]. The ventilation focus is compromised by its restrictive nature, providing hypoventilation patterns, decreased inspiratory muscle action and increased respiratory effort[5]. To enhance lung re-expansion, it is necessary to modify ineffective breathing patterns based on techniques that make the person aware of ventilatory dynamics and mechanics. Techniques for correcting ventilatory asynergy and optimizing alveolar ventilation should be established, such as the control and dissociation of respiratory times; abdomino-diaphragmatic breathing; exhalation with the lips half-closed; thoracic and joint mobilization; abdomino-diaphragmatic re-education; selective and global costal re-education; respiratory muscle training with emphasis on inspiration and controlled inspiratory flow exercise[11]. Within the focus expectorate, this shows a decrease in its effectiveness associated with pathophysiological changes in the airways, mucociliary system and the decrease in the strength of the inspiratory and expiratory muscles, also contributing to the impairment of ventilation and, consequently, of the respiratory function. A set of techniques such as effective coughing are included for this focus; drainage of secretions with accessory maneuvers; postural drainage; autogenic drainage; huffing and the forced expiration technique and active cycle of breathing techniques[11].

The bibliography refers to little scientific evidence about the real benefits of functional respiratory reeducation in people with pneumonia, although the intervention remains considerably applied[5]. In view of the above, this case study presents the guiding question: “What is the contribution of the Specialist Nurse in Rehabilitation Nursing in the respiratory function of a person with bacterial pneumonia secondary to viral infection by Influenza A?”.

This case study presents the general objective of evaluating the impact of the RN intervention, with the application of respiratory functional reeducation, in people with bacterial pneumonia secondary to viral infection by Influenza A.

For the purpose of the study, the following specific objectives are identified:

• To identify gains sensitive to functional respiratory re-education in ventilation and expectorate focuses;

• To list RN interventions in their respective focuses.

MATERIAL AND METHODS

The case study consists of a structured research method for knowledge of individual or group phenomena. For Yin, this is an empirical research when the limits between the phenomenon and context are not evident, with the objective of exploring, describing, and explaining the event[13]. In Nursing research, the case study allows that, through different sources of evidence, it is possible to study highly complex life phenomena[13].

This case study is structured according to the theoretical frameworks of Yin and Stake in six stages: Problem definition; Case definition; Theoretical foundation; Preparation of the study protocol; Data collection; Analysis and discussion of results[13].

In this case study, a person with Streptococcus pneumoniae Pneumonia secondary to viral infection by Influenza A is presented, addressing the rehabilitation program of the respiratory function during hospitalization in order to show the results obtained. Data collection was performed through anamnesis and consultation of the clinical file.

The respiratory rehabilitation program took place in February 2019 with the beginning of admission to hospital. The person was designated as an individual in order to safeguard data confidentiality and anonymity. In this way, due to the involvement of personal, non-transferable and confidentiality issues of the hospital clinic, it became essential to respect the ethical guidelines for nursing research, following the principles of Beneficiency; No Malefficiency; Loyalty; Justice; Veracity and Confidentiality, thus informing about the risks and benefits[14]. Informed consent was obtained prior to data collection.

The specific instruments for the assessment of respiratory function were based on the Guiding Guide for the Good Practice for Respiratory Rehabilitation of the Ordem dos Enfermeiros (Nursing Council). Thus, the assessment was incident on the Pathological Process, based on signs and symptoms of respiratory pathology: chest pain, measured by the Numerical Pain Scale; Dyspnea, measured by the Modified Borg Scale; coughing and sputum due to the macroscopic aspect and the Body Process, carrying out the assessment of respiratory function through physical examination (inspection, palpation, percussion and auscultation), arterial blood gas and chest teleradiography.

The results shown in this study approach a person who presented as selection criteria: elderly people, aged 65 years-old or over; absence of known personal respiratory history and Influenza A infection in the current hospitalization.

Case presentation

Anamnese

Resulting from the information obtained in the anamnesis, it directs the health professional towards the diagnosis and respective therapeutic plan. It should consist of information related to past history, family and socioeconomic history and current clinical history[9].

This case corresponds to an individual, 90 years-old, male, Caucasian and of Portuguese nationality, married, residing with his wife and child. Currently retired, having worked as an electrical engineer. Patient went to the emergency department on February 3, 2019 due to fever, dyspnea, productive cough with the presence of whitish sputum, rhinorrhea, chest pain in the infracostal region with pleuritic characteristics and myalgia with five days of evolution. Upon arrival at the emergency department, presented a fever peak of 39.2°C. Complementary exams were performed, verifying an arterial blood gas analysis performed with oxygen supply at 3L/min through nasal glasses with a pH of 7.45; pCO2 35mmHg; pO2 58mmHg; 3.5mml/L lactates and 24.3 mmol/L HCO3, a chest cephalogram described as "bilateral peri-hilar reinforcement. Permeable costus and cardiophrenic sinuses, without images suggestive of condensation", a nasal exudate positive for Influenza A and a positive antigenuria for Streptococcus pneumoniae.

He is transferred on February 4, 2019 to hospital and the oxygen supply is increased to 5L/min through nasal cannula.

The individual has known personal history of high blood pressure and Crohn's disease. Usual medication: Messalazine 100mg, twice a day; Rifaximin 200mg twice daily; Pravastatin 20mg/day. No allergies Known.

Regarding the performance of his activities of daily living, patient was independent until the date of hospitalization, practicing regular physical exercise three times a week in the gym. In terms of socio-family and housing, does not present with economic difficulties and resides on the 3rd floor of a building with an elevator.

Rehabilitation Nursing Assessment

For an efficient performance of the RN in the implementation of its performance, it is necessary to associate the data obtained through anamnesis with the observation of complementary diagnostic tests and a physical examination of the person with respiratory pathology, taking into account details that may go unnoticed[8,9]. The rehabilitation plan began on February 14, 2019, and the respective interventions were implemented until February 21, 2019. The individual was discharged from the clinic on February 22, 2019.

The physical examination, based on the four stages mentioned above, as well as the complementary means of diagnosis allow the identification of the stage of the disease and the consequent elaboration of nursing diagnoses, adapting the intervention and emphasizing the alterations presented by the person. These instruments, according to the scientific evidence recommended by the American Association of Cardiovascular & Pulmonary Rehabilitation, were applied before and after the implementation of the respiratory functional reeducation program, allowing the identification of sensitive gains in rehabilitation nursing care. In restrictive pathology, scientific studies reveal that the effectiveness of respiratory rehabilitation is scarce, essentially focusing on the functional status and reduction of dyspnea[5].

The interventions focused on aerobic and resistance exercises are currently considered as the modality that provides the most benefits to people with pneumonia[5]. Their monitoring was continuous, based on peripheral oxygen oximetry (SpO2) and heart rate values, in addition to the previously mentioned Modified Borg Scale.

Nursing diagnoses

According to the ICNP® language, and within the scope of the respiratory function rehabilitation program, four nursing diagnoses were identified related to the "ventilation" and "expectation" focuses:

- Compromised ventilation;
- Expectorate ineffectively;
- Potential to improve knowledge about coughing technique;
- Potential to improve ability to use coughing technique.

Respiratory Function Rehabilitation Program

Nursing interventions appropriate to the diagnoses defined by the assessment of respiratory function, based on what is recommended by the Documental Standard of Nursing Care of the Rehabilitation Nursing Specialty[15] and Guiding Guide for Good Practice of Respiratory Rehabilitation[5], are presented in table 1.

Through the set of nursing interventions presented, associated with a holistic look at the person targeted by the established care, other nursing diagnoses were also enunciated, such as intolerance to compromised activity and reduced muscle movement.

The interventions were ensured in the various sessions held, lasting between 30 and 45 minutes.

Nursing diagnosis	
Impaired ventilation, in a moderate degree	
Nursing interventions	- To observe chest [color, deformations, symmetry, before and after intervention]; - Auscultate the chest [identify breathing sounds and adventitious sounds, before and after intervention]; - To monitor ventilation [expansibility, type, rhythm, amplitude, inspiratory and expiratory times, rescue of accessory muscles, before and after intervention]; - To monitor [peripheral oxygen oximetry (SpO2)]; - To monitor respiratory rate; - To observe the exam [arterial blood gas and chest teleradiography]; - To encourage the use of breathing devices [incentive spirometer]; - To optimize ventilation through the positioning technique [resting position and relaxation techniques; Headboard at 30-45º; Postural correction]; - To perform breathing techniques [control and dissociation of breathing times; exhalation with semi-closed lips, 2 sets of 10 repetitions; abdominodiaphragmatic re-education with 1kg resistance; bilateral lower costal reeducation]; - To perform respiratory kinesitherapy [exercise of rotation of the humeral scapula; global costal opening with stick, 2 sets of 10 reps; selective costal opening; thoracic and joint mobilization with respiratory control and emphasis on inspiration – stretching, active chest mobilization with and without therapeutic ball, shoulder adduction/abduction in the horizontal plan and sagittal axis in the standing position; kinetic chain anterior flexion of the pelvis to the bottom of the bed, 1 series of 10 repetitions].
Ineffective expectorating	
Nursing interventions	- To evaluate cough reflex; - To encourage coughing; - To encourage fluid intake; - To perform inhalation therapy through an inhaler; -To perform respiratory kinesiotherapy [chest vibration technique, chest percussion technique,

	chest compression technique]; - To assist in coughing [assisted cough, directed cough]; - To watch over the sputum.
Potential to improve knowledge of cough technique	
Nursing interventions	- To assess knowledge about cough technique; - To teach about coughing technique [assisted cough: sitting or head-up position, with controlled diaphragmatic breathing and emphasis on deep breaths. Close the glottis and contract the abdominals. Vigorous manual compression assisted by a professional, at the beginning of the expiratory phase, on the hypogastric or lower costal region. The pressure applied is quick and applied 2 to 3 times, increasing chest compression, stimulating coughing; Directed cough: sitting position and feet flat, trunk leaning forward. Inhales through the nose as if to "smell the flower", compresses the abdomen with the upper limbs hugging a pillow, with the trunk bent and coughing; Huffing and forced expiration technique]
Potencial to improve capacity to emply cough technique	
Nursing interventions	- To assess ability to use the cough technique; - To instruct about cough technique [assisted coughing; directed cough; Huffing and forced expiration technique] - To train the cough technique

Table 1 – List of Nursing Diagnoses and Interventions [5,15]

RESULTS

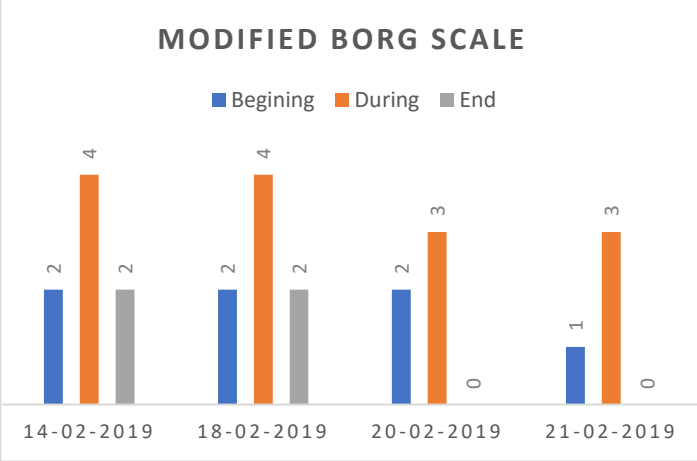
The individual's respiratory function rehabilitation program included a total of four sessions, all of which were alert and very participatory in the implemented interventions.

The evaluation of the results obtained from the interventions of the rehabilitation program took place as defined by the Guiding Guide for Good Respiratory Rehabilitation Practice, starting with the assessment of the pathological process, giving a subjective assessment of the respiratory function, through the signs and symptoms presented[5]. Pain assessment was performed using the Numerical Pain Scale (Table 2). The individual rated pain level 0, before and after the intervention.

Date (2019)	14/02	18/02	20/02	21/02
Pre-intervention intensity	0	0	0	0
Post-intervention intensity	0	0	0	0

Table 2- Results of the assessment using the numerical pain scale

Dyspnea is experienced as respiratory distress. This discomfort was continuously monitored by the individual, using the Modified Borg Scale. Its result was recorded throughout the sessions, before the intervention and after a period of rest. Its monitoring during the established plan did not limit the performance of the outlined exercises, verifying that there was a gradual improvement in effort tolerance (Graphic 1). In the first sessions, there is an explicit greater respiratory discomfort and tiredness expressed by the individual, which progressively diminished, stating "I don't feel tired at all" after a period of rest at the end of the session (Graphic 1).



Subtitle			
0	No one	**5**	Intense
0,5	Very, very light	**6**	
1	Very light	**7**	Very intense
2	Light	**8**	
3	Moderate	**9**	Very, very intense
4	Low intensity	**10**	Maximum

Graphic 1- Results of the modified Borg Scale assessment

Initially, the cough was productive and ineffective, failing to expel secretions. This data showed the need for an adjustment in the validation process of knowledge and ability to use the cough technique. Coughing became more effective in the 2nd session, with better mobilization of secretions, which despite being in small quantities, allowed their elimination (Table 4). The characteristics of the secretions were possible to be evaluated during the planned exercises, presenting themselves as thick and mucopurulent. With the acquisition of the ability to use the technique of assisted and progressively directed coughing, associated with nebulization with previous saline solution, there was better fluidity of the same, ending

up in the last session as there were only dry cough accesses (Table 3).

Nursing diagnosis	14/02	18/02	20/02	21/02
Potential to improve knowledge of cough technique	ND	D	D	D
Potential to improve ability to use cough technique	ND	D	D	D

Subtitle: D – Demonstrate; ND – Not demonstrate.

Table3 - Assessment of the knowledge and learning of skills dimension of the expector focus

As part of the assessment of the body process, a systematic assessment was carried out in order to identify pathophysiological changes during the evolution of the pathology, as well as the implemented interventions. This assessment consisted of a physical examination which included inspection, palpation, percussion and auscultation.

The inspection essentially focused on the evolution of the breathing pattern, the presence of respiratory distress and postural deformities.

It was found that, at first, the individual had the need to resort to the use of accessory muscles of breathing, which provide with greater muscle tension. Although there were no thoracic asymmetries and absence of spinal deformities, a constant elevation of the shoulders and shoulder blades was notable, which simultaneously conferred a stressful posture, reflected in the subjective perception of dyspnea. Progressively, with the measures adopted for postural correction and relaxation techniques, it stopped resorting to accessory muscles associated with a more regular breathing pattern and a type of breathing with emphasis on diaphragmatic excursion and, consequently, on the inspiratory phase. This fact was possible with the synchrony and collaboration obtained in the dissociation of respiratory times, in the 2nd session (Table 4).

Date	14/02/19		18/02/19		20/02/19		21/02/19	
	Start	End	Start	End	Start	End	Start	End
Oxygen supply (L/min)	5	5	3	3	2	2	2	1
Aerosol therapy	N	N	N	N	S	N	S	N
Chest symmetry	S	S	S	S	S	S	S	S
Chest deformations	N	N	N	N	N	N	N	N
Breath Type	M	M	M	M	AD	AD	AD	AD
Rhythm	I	I	I	R	R	R	R	R
Amplitude	D	D	D	D	D	NO	NO	NO
Accessory muscles	S	N	S	N	N	N	N	N
Coughing	IN/P	IN/P	IN/P	EF/P	EF/P	EF/P	SE	SE
Secretions	NA	MP	NA	MP	NA	MP	NA	NA
Viscosity	NA	ES	NA	ES	NA	ES	NA	NA

Subtitle: S - Yes; N - No; NO - Normal; D - Decreased; R - Regular; I - Irregular; M - Mixed; AD - Abdominodiaphragmatic; MP - Mucopurulent; ES - Thick; IN- Ineffective; EF - Effective; P - Productive; SE - Drought; AU - Absent; NA - Not evaluated.

Table 1- Inspection Evaluation Results

Constant weaning from oxygen supply, through follow-up and medical prescription, was tolerated, not limiting both the number of sets and repetitions in the following sessions, as well as in the assessment using instruments such as the Modified Borg Scale. Through palpation, a bilateral evaluation of the chest and diaphragm was performed, essential for the follow-up of the evaluation of chest elasticity, which was found to be slight. During the sessions, the thoraco-vocal tremor showed an increase felt in the later phase, more incident in the bases, not registering a significant reduction with the accompanying expulsion of secretions (Table 5).

Percussion showed results aimed at different densities of lung fields. In the four sessions carried out, it was verified that the sound was never compromised at the apical level. On the other hand, and in a characteristic way in this pathology, dullness was found bilaterally installed in the bases and only in the last two sessions was there a slight clear pulmonary sound (Table 6).

Date	14/02/19		18/02/19		20/02/19		21/02/19	
	Start	End	Start	End	Start	End	Start	End
Centralized trachea	S	S	S	S	S	S	S	S
Elasticity	D	D	D	D	D	M	M	M
Thoraco-Vocal Fremit:	Anterior face of the chest							
1/3 Superior Right	M	M	M	M	M	M	M	M
1/3 Middle Right	M	M	M	M	M	M	M	M
1/3 Bottom Right	M	M	M	M	M	M	M	M

1/3 Top Left	M	M	M	M	M	M	M	M
1/3 Middle Left	M	M	M	M	M	M	M	M
1/3 Bottom Left	M	M	M	M	M	M	M	M
Thoraco-Vocal Fremit:	Posterior face of the chest							
1/3 Superior Right	M	M	M	M	M	M	M	M
1/3 Middle Right	A	A	A	A	A	A	M	M
1/3 Bottom Right	A	A	A	A	A	A	A	A
1/3 Top Left	M	M	M	M	M	M	M	M
1/3 Middle Left	A	A	A	A	A	A	M	M
1/3 Bottom Left	A	A	A	A	A	A	A	A

Subtitle: S - Yes; N - No; AU - Absent; M - Kept; D - Decreased; A - Incresead.

Table 2- Results of palpation assessment

Digit-digital thoracic percussion - Anterior face of the chest								
Date	14/02/19		18/02/19		20/02/19		21/02/19	
	Start	End	Start	End	Start	End	Start	End
1/3 Superior Right	SP	SP	SP	SP	SP	SP	SP	SP
1/3 Middle Right	HO	HO	HO	HO	HO	SP	SP	SP
1/3 Bottom Right	M	M	M	M	M	M	M	M
1/3 Top Left	SP	SP	SP	SP	SP	SP	SP	SP
1/3 Middle Left	HO	HO	HO	HO	HO	HO	HO	SP
1/3 Bottom Left	M	M	M	M	M	M	M	M
Digit-digital thoracic percussion - Posterior surface of the chest								
Date	14/02/19		18/02/19		20/02/19		21/02/19	
	Start	End	Start	End	Start	End	Start	End
1/3 Superior Right	SP	SP	SP	SP	SP	SP	SP	SP
1/3 Middle Right	SP	SP	SP	SP	SP	SP	SP	SP
1/3 Bottom Right	HO	HO	HO	HO	HO	HO	HO	HO
1/3 Top Left	SP	SP	SP	SP	SP	SP	SP	SP
1/3 Middle Left	SP	SP	SP	SP	SP	SP	SP	SP
1/3 Bottom Left	HO	HO	HO	HO	HO	HO	HO	HO

Subtitle: SP - Clear Pulmonary Sound; M - Massive; HO - Hyposonority; HE - Hyperactivity.

Table 3- Percussion Evaluation Results

Specialized care in respiratory rehabilitation was guided by auscultation performed at the beginning of the intervention and when necessary during the session, providing important data for the dynamics of the nursing intervention statement. Based on the analysis of the data obtained, the almost general decrease in vesicular murmur was evident in the previous auscultation up to the 3rd session. On the posterior face, the best recordings were obtained with a clearly audible vesicular murmur. The crackling rattles, in the inspiratory phase, were the only adventitious sounds present in this study, having been audible bilaterally in the middle and lower thirds. With the performance of promotional exercises for airway cleaning in conjunction with the ability to use expectoratoin techniques, in the fourth session, crackling ferns were found only present in both bases at a lower intensity (Table 7 and 8).

Data		14/02/19				18/02/19				20/02/19				21/02/19			
		Start		End		Start		End		Start		End		Start		End	
Pulmonary Bilaterality		D	E	D	E	D	E	D	E	D	E	D	E	D	E	D	E
Vesicular murmur	1/3 Sup	D	D	D	D	D	D	M	M	M	M	M	M	M	M	M	M
	1/3 Med	D	D	D	D	D	D	M	M	M	M	M	M	M	M	M	M
	1/3 Inf	A	A	A	A	A	A	D	A	D	D	D	D	D	D	D	D
Adventitious sounds	1/3 Sup																
	1/3 Med		FC														
	1/3 Inf	FC	FC	FC	FC	FC	FC		FC		FC						

Subtitle: M - Kept; D - Decreased; A - Absent; FC - Crackling ferns.

Table 7- Results of the evaluation by previous consultation

Date		14/02/19				18/02/19				20/02/19				21/02/19			
		Start		End		Start		End		Start		End		Start		End	
Pulmonary Bilaterality		D	E	D	E	D	E	D	E	D	E	D	E	D	E	D	E
Vesicular murmur	1/3 Sup	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
	1/3 Med	D	D	M	M	M	M	M	M	M	M	M	M	M	M	M	M
	1/3 Inf	D	D	D	D	D	D	D	D	M	M	M	M	M	M	M	M
Adventitious sounds	1/3 Sup																
	1/3 Med	FC	FC												FC		
	1/3 Inf	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC

Subtitle: M - Kept; D - Decreased; A - Absent; FC - Crackling ferns.

Table 8 – Results of posterior auscultation evaluation

Vital parameters never conferred limitations or even contraindications to the intervention. From this analysis, regular recording of heart rate (Table 9) should be highlighted, not suggesting exercise intensity conditioning. SpO2 always remained above 95% with the beginning of the rehabilitation sessions, taking into account that weaning from oxygen therapy was performed from session to session. With no worsening of dyspnea after rest, the last session was the only one in which SpO2 was recorded with a supplemental intake lower than at the beginning, reflecting only 1% less (Table 9).

Date	14/02/19		18/02/19		20/02/19		21/02/19	
	Start	End	Start	End	Start	End	Start	End
Blood Pressure (mmHg)	135/65	106/65	105/63	119/63	142/81	112/70	113/63	124/75
Heart Rate (Bpm)	94	80	91	98	96	96	96	95
Respiratory Rate (Cycles/min)	25	20	22	20	19	18	20	18
Temperature (˚C)	36.4	36.5	35.6	36.0	37.0	36.6	36.5	36.7
Peripheral Oximetry (%)	92	95	95	95	96	98	96	95

Table 4- Assessment of vital signs and peripheral oxygen oximetry

Complementary diagnostic tests are essential for the assessment of the individual's respiratory pathology, as well as its evolution.

Figure 1 shows the imaging evolution by means of teleradiography of the individual's chest. The three cephalograms present a central image that expresses a global parenchymal infiltrate. The greatest consolidation remained at the level of the pulmonary bases bilaterally. In the last image (2/21/2019), there is a maintained alignment of the diaphragmatic hemicupulas and a slight increase in hypertransparency of both lung fields.

Arterial blood gas reflect the exchange of gases between alveoli and the pulmonary blood stream, being an integral part of the study of respiratory function[5].

Date (2019)	O2 (l/min)	pH	pCO2 (mmHg)	pO2 (mmHg)	Lact (mmol/L)	spO2 (%)	HCO3 (mmol/L)
14/02	5	7.490	39.0	52.0	1.60	85.2	29.7
18/02	3	7.450	47.0	55.0	1.90	90.3	34.7
20/02	2	7.440	39.0	52.0	1.20	89.9	26.5
21/02	1	7.450	41.0	65.0	1.20	94.5	28.5

Table 10 – Arterial Blood Gas Results

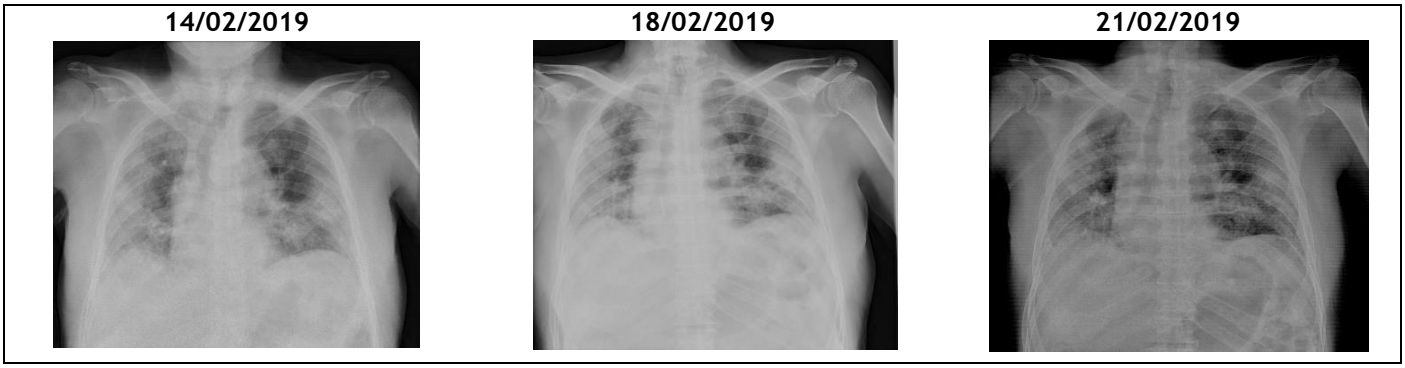


Figure 1- Chest teleradiography

By analyzing the values obtained in arterial blood gas, it can be seen that the first 3 sessions are marked by considerable hypoxemia, which had no observable repercussions in the recording of SpO2 or heart rate. These records were obtained in sessions performed with a longer time interval. In the last session there is a general stabilization of parameters within the limits established by the literature and a slight improvement in hypoxemia.

DISCUSSION

The results obtained during the evaluation of the rehabilitation sessions demonstrate that the specialized care of rehabilitation nursing plays an important role in the re-education of the respiratory function of the person with restrictive respiratory pathology, namely bacterial pneumonia.

The approach to the hospitalized person with respiratory pathology is multidisciplinary, involving the medical team, health technicians, operational assistants, and it is only possible for nurses, who maintain direct contact with the person on a daily basis, to carry out systematic monitoring of the health condition and thus establish diagnoses of rehabilitation nursing that allow the most appropriate intervention and in an individualized way, accelerating recovery in situations of acute illness, already demonstrated with level of evidence A by the last update of the ATS/ERS document in 2013[5].

Respiratory rehabilitation programs include a holistic view of the person receiving care, providing individualized aspects of care that must meet the person's preferences and expectations[16]. Based on the results obtained, the symptoms associated with the acute episode were minimized, being considered one of the objectives to be achieved with a program of this type[5].

The initial assessment with the target person was essential to collect information both subjectively and through physical examination and allowed for the adaptation of interventions following the stage of the disease. This assessment is enriched if complemented by the analysis of complementary means of diagnosis.

The selection of assessment instruments such as the Modified Borg Scale and its ability to directly measure dyspnea by the person at different times allowed for the adaptation of the intensity and frequency of the exercises to the person's condition and expectations; the importance of training with moments of pause and recovery is also highlighted, as well as the evaluation of symptoms after sessions. The implementation of techniques to relieve muscle tension and awareness of respiratory times at an early stage, complemented with exercises to re-educate the respiratory function, showed reductions in the perception of dyspnea felt, ending up with no report of perceived tiredness after rest in the last sessions, with a rating of 0 out of 10 possible on the Modified Borg Scale.

Acting on the dimension of knowledge and on the ability to learn the cough technique enabled the person to perform it independently and more directed to their needs, provided gains in the mobilization and elimination of secretions in the various sessions carried out, ending in the last session only in the presence of dry cough. In addition to this intervention, in a characteristic way.

The program established and defended by the guiding bibliographic evidence based on the opinion of experts[5,8-9] showed efficacy in the results obtained in the pathological process, however, it was not equally evident in the monitoring of the body process.

In the physical examination, consisting of four stages, percussion and palpation were not by themselves a record of significant and/or defining changes in the staging of the disease evolution process. The benefits recorded focused on inspection for improved breathing pattern, being more regular with respiratory rates between 12 and 20 cycles/min, relaxation of accessory muscles of breathing and auscultation of the posterior phase of the thorax, with a overall increase in vesicular murmur and an absence of the sizzling ferns felt in the bilateral middle third. At the last assessment, these adventitious sounds were still present in the lung bases, although at a lower intensity, which coincided with the best ability to cough.

Together with the exercise program for diaphragmatic and costal re-education, the techniques performed at the level of rest, postural correction and associated thoracic mobilizations allowed for better tolerance to exertion and reduced oxygen supply. The SpO2 evaluation method, non-invasive and easy to apply using a portable oximeter, allowed this evaluation to be carried out continuously with the necessary safety for the person. It was possible to verify that the possibility of allowing visual contact of the SpO2 result

obtained during the exercises worked as a positive stimulus for their motivation.

Incentive spirometry was important not only in the training of respiratory muscles[8] but also in the motivation and commitment to complying with the sessions due to its ability to establish visual goals to be achieved. Its use may occur before the session and after the rest, with improved results in this second evaluation compared to the first.

Chest radiography confirmed pulmonary involvement, as well as the location and extent of lobar consolidation[8]. The appearance of hypertransparency was slightly evident on the last day, not following the evolution presented by data such as SpO2, Modified Borg Scale monitoring, pulmonary auscultation and the reduction in sputum upon coughing. However, the imaging changes may not immediately translate current changes[8].

This case study reflects the importance of the RN in developing and improving its respiratory function assessment techniques in order to carry out a systematic assessment, if necessary, readjust its intervention based on the data obtained.

In this research, it would have been beneficial to carry out sessions with a shorter time interval, because a greater evolution between the 20th and 21st of February. According to gasometric values obtained, the reversion of the marked hypoxemia occurred only in this period and was not limited by the reduction of oxygen supply, which was initially at a rate of 5L/min and which at the end of the program was administered at 1L/min. This situation is not in line with what Cordeiro & Menoita defend in their bibliography, when state that the people as the target of this study, that is, without previous respiratory pathology, in a situation of bacterial pneumonia, regular arterial blood gas analysis is not justified, except in low SpO2[8].

It is relatively frequent that people with Influenza A who are overinfected with bacterial pneumonia develop severe hypoxemia conditions difficult to reverse. In this case study, both focuses were addressed with the appropriate interventions directed towards their resolution, supported by the most updated bibliography. The lack of other similar studies did not make it possible to establish a comparison of the increase in pO2 associated with a respiratory rehabilitation intervention plan.

FINAL THOUGHTS

This case study highlighted the benefits of the respiratory function, in the ventilation and expectoration focuses, resulting from the specialized intervention of the specialist nurse in rehabilitation nursing.

In respiratory functional reeducation, it is essential to perform a subjective assessment of respiratory function, complemented by physical examination and complementary diagnostic data, such as chest teleradiography and gasimetric data. It results in a set of data that allow the rehabilitation nurse to analyze the information obtained, identify problems and plan the respective interventions, supported by reliable and valid instruments.

Thus, the gains obtained by the functional respiratory reeducation centered on the perception of dyspnea by the Modified Borg Scale, with a reduction from 2 to 0; on breathing pattern with absence of recruitment to accessory muscles, decrease in respiratory cycles per minute accompanied by a more regular pattern with diaphragmatic excursion; on auscultation, essentially of the posterior thorax, with an overall increase in vesicular murmur and reduction in crackling sounds; on chest X-ray with the appearance, although slight but progressive, of hypertransparency in both lung fields; in cough, with training to use directed cough, ending the sessions with an essentially dry cough; in gasimetric results showing the beginning of reversal of hypoxemia in the last session; in the weaning from the supplemental oxygen supply, starting with 5L/min and ending with 1L/min.

To obtain the abovementioned gains, it was essential to use specialized techniques directed to the different focuses, including the ventilation focus: interventions such as the resting position, massage of accessory muscles, control and dissociation of respiratory times, expiration with semi-closed lips, rotation of the humeral scapula, global opening with a stick, bilateral lower costal and abdominodiaphragmatic re-education, thoracic mobilization exercises and incentive spirometry. In the spectorate focus, techniques such as accessory maneuvers (vibration, percussion and compression), assisted/directed coughing, huffing and the forced expiration technique are evidenced, supported by the previous use of nebulizers with saline solution.

Based on the epidemiological data obtained, bacterial pneumonia as a possibility of secondary infection resulting from Influenza A is an increasingly growing fact. It is hoped that this case will contribute to giving visibility to the importance that rehabilitation nursing can have in reducing the comorbidities resulting from these episodes. It would be beneficial to develop more studies on this pathology, which despite being characteristically restrictive, suffers from seasonal influence.

It is suggested in future studies the possibility of performing earlier and more regular sessions (or even preferably daily) in order to contribute to a better clarification of the importance that the intervention of respiratory functional reeducation by RN can obtain in sustained severe hypoxemia and thus reduce the length of hospital stay, culminating in an increased level of evidence. Intervention plans with greater emphasis on aerobic exercises using cycle ergometers and thoracic mobilizations are also suggested, allowing the ventilation-perfusion index. In some cases, intervention plans of shorter duration and/or divided into two daily moments will be considered.

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MODULAÇÃO CARDÍACA PELO EXERCÍCIO FÍSICO NA PESSOA COM INSUFICIÊNCIA CARDÍACA DESCOMPENSADA – RELATO DE CASO

MODULACIÓN CARDÍACA POR EJERCICIO EN LA PERSONA CON INSUFICIENCIA CARDÍACA DESCOMPENSADA - REPORTE DE CASO

CARDIAC MODULATION BY EXERCISE IN A PATIENT WITH DECOMPENSATED HEART FAILURE - CASE REPORT

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RESUMO

Introdução: Os doentes com insuficiência cardíaca descompensada caracterizam-se por apresentar elevada intolerância à atividade, associada a dispneia e edemas. O treino de exercício físico permite promover um aumento da tolerância ao esforço, assim como melhoria da função cardíaca.

Objetivo: Identificar sinais de modulação cardíaca e consequente melhoria da capacidade funcional após a implementação de um plano de exercício físico estruturado.

Método: Relato de caso de abordagem quantitativa. Pessoa com insuficiência cardíaca descompensada de etiologia isquémica e valvular, manifestando elevado grau de intolerância à atividade assim como descompensação hemodinâmica.

Foram avaliados parâmetros fisiológicos como FC, TA, PSE pela escala de Borg e a sua tolerância à atividade, no momento da admissão e ao longo das sessões de treino. O T6MM foi aplicado em 2 momentos distintos: ao 4º dia de internamento e à data da alta, como forma de avaliar a evolução da capacidade funcional. O doente em questão encontra-se inserido num ensaio clínico randomizado onde se pretende avaliar a eficácia e segurança do exercício físico, sendo utilizados como instrumentos de avaliação a escala de LCADL, o Índice de Barthel, assim como do T6MM.

Resultados: Verificou-se uma melhoria da capacidade funcional da pessoa, avaliada pelo teste dos 6 minutos de marcha (T1: 210m, T2: 295m), assim como uma redução da frequência cardíaca em repouso (85 bpm vs 68 bpm) e de treino (145bpm vs 94bpm). Não foram verificados eventos adversos durante as sessões de treino.

Conclusões: A intervenção implementada nesta situação clínica revelou-se segura, sendo igualmente eficaz na melhoria da capacidade funcional e modulação da frequência cardíaca em repouso e durante o treino.

Descritores: Treino Aeróbio, insuficiência cardíaca, reabilitação cardíaca; Enfermagem de Reabilitação

RESUMEN

Introducción: Los pacientes con insuficiencia cardíaca descompensada se caracterizan por una alta intolerancia a la actividad asociada con disnea y edema. El entrenamiento físico permite una mayor tolerancia al ejercicio y una función cardíaca mejorada.

Objetivo: identificar signos de modulación cardíaca y la consiguiente mejora de la capacidad funcional después de la implementación de un plan de ejercicio estructurado.

Método: Relato de caso de enfoque cuantitativo. Paciente con insuficiencia cardíaca descompensada de etiología isquémica y valvular, que manifiesta un alto grado de intolerancia a la actividad, así como descompensación hemodinámica.

Los parámetros fisiológicos como frequenica cardiaca, tensión arterial, percepción subjetiva del esfuerzo evaluada por la escala de Borg y la tolerância del paciente a la actividad en el momento de la admisión y durante las sesiones de entrenamiento. El T6MM se aplicó en dos momentos diferentes: en el cuarto día de hospitalización y en la fecha de alta, como una forma de evaluar la evolución de la capacidad funcional. El paciente en cuestión es parte de un ensayo clínico aleatorizado que tiene como objetivo evaluar la eficacia y la seguridad del ejercicio físico, y se utiliza como herramientas de evaluación en la escala LCADL, el índice de Barthel y el T6MM.

Resultados: Hubo una mejora en la capacidad funcional de la persona, evaluada mediante la prueba de caminata de 6 minutos (T1: 210m, T2: 295m), así como una reducción en la frecuencia cardíaca en reposo (85 lpm frente a 68 lpm) y entrenamiento. (145bpm vs 94bpm). No se encontraron eventos adversos durante las sesiones de entrenamiento.

Conclusiones: La intervención implementada en esta situación clínica demostró ser segura e igualmente efectiva para mejorar la capacidad funcional y modular la frecuencia cardíaca en reposo y durante el entrenamiento.

Descriptores: Insuficiencia cardíaca, ejercício, reabilitacion cardíaca, enfermeira de rehabilitación

ABSTRACT

Introduction: Patients with decompensated heart failure are characterized by low exercise tolerance associated with dyspnea and edema. Exercise training promotes exercise tolerance as well as an improvement in ventricular function.

Objective: To identify signs of cardiac modulation and consequent improvement of functional capacity after the implementation of a structured exercise plan.

Method: It is a quantitative approach case report, about a patient with decompensated heart failure of ischemic and valvular etiology, manifesting a high degree of activity intolerance as well as hemodynamic decompensation.

Physiological parameters such as Heart Rate, Blood Pressure, Subjective perception of effort evaluated by the Borg scale and the tolerance of the patient to activity at baseline and throughout the training sessions. The 6MWT was applied at two different moments: on the 4th day of hospitalization and at discharge, as a way to evaluate the evolution of functional capacity. This patient is enrolled on randomized clinical trial that aims to evaluate the feasibility and safety of exercise, being used as assessment tools the LCADL scale, the Barthel Index, as well as the 6MWT.

Results: There was an improvement in the patient's functional capacity, assessed by the 6-minute walk test (T1: 210m, T2: 295m), as well as a reduction in resting heart rate (85 bpm vs 68 bpm) and training heart rate (145bpm vs 94bpm). No adverse events occured during training sessions.

Conclusions: The intervention implemented in this clinical situation proved to be safe and equally effective in improving functional capacity and modulating heart rate at rest and during exercise training.

Keywords: Breathing Exercises; Bacterial Pneumonia; Rehabilitation Nursing; Case Reports.

INTRODUCTION

Heart failure (HF) is a syndrome characterized by signs and symptoms such as dyspnea, fatigue and edema, which lead to decreased exercise tolerance, greater functional dependence and impaired performance in activities of daily living (ADL), as well as limitations in social life and, consequently, decreased quality of life[1-5].

HF has a significant economic impact due to the high cost of treatments, the person's disability and lack of productivity, as well as high mortality rates[6,7]. It affects an estimated 20 million people worldwide, with a predicted 25% increase in prevalence by 2030, and a doubling of the inherent costs is expected[8]. It represents in Portugal more than 50,000 hours of hospitalization, corresponding to about 12% of in-hospital deaths[9].

HF is classified according to the patient's functional status using the New York Heart Association (NYHA) scale[10,11] into 4 classes, according to table 1.

The treatment of HF is multifactorial, including a wide variety of pharmacological therapies and non-pharmacological interventions, such as cardiac rehabilitation (CR). CR can be defined as a sum of activities that favorably influence the underlying causes of cardiovascular disease, so that the patient can effectively manage their therapeutic regimen and achieve functional, psychological and social maximization, in order to resume their role in society [12-14].

Parameters	
Class I	Absence of symptoms, tolerance to normal physical activity
Class II	Asymptomatic at rest; ADL's cause symptoms such as dyspnea and/or tiredness
Class III	Asymptomatic at rest, less intense activities than ADL's cause symptoms
Class IV	Symptomatic even at rest

Table 1 – Functional classes NYHA

Physical exercise (PE) is a safe, afordable and viable therapeutic resource, being a crucial component of CR. According to the recommendations of the European Society of Cardiology, patients with HF should be included in aerobic training programs, in order to promote their functional capacity (FC) and improve the characteristic symptoms of HF[1,4,13]. The performance of regular physical activity in people with stabilized chronic HF is directly related to the decrease in cardiovascular mortality, improvement quality of life, decrease hospitalization rates and even reduced intolerance to physical exercise itself, being essential its inclusion in the daily clinical practice of all centers that provide care to patients with HF [4,13,15]. Aerobic training (AT) is the best-founded training typology for the treatment of people with chronic HF[1,10,11], and there is no minimum beneficial limit for it, that is, the minimum amount of exercise performed by the patient will always benefit from not performing any type of training or physical activity[1]. The beneficial effects of PE are related to the

improvement of cardiovascular and respiratory function, that is, increased maximum oxygen consumption, decreased myocardial oxygen consumption, decreased blood pressure (BP) and heart rate (HR) at rest, increase in the threshold of anginal symptoms and lameness, as well as control and reduction of cardiovascular risk factors (CRF)[16,17].

The PE prescription is based on Frequency, Intensity, Time and Type of exercise (FITT), which must be adjusted according to the type of care (inpatient or outpatient), the stage of the disease (acute or chronic) and the limitations or motivation of the person[10,17]. Despite all the benefits and recommendations for its application in an inpatient context, PE training is however largely underused[10], and there is still not enough reasoning to prove its level of effectiveness and safety when implemented in people hospitalized for decompensated HF.

Some of the factors that lead to this underutilization are related to the physiological limiting mechanisms characteristic of the disease, namely the decrease cardiac output, decrease contractility, diastolic impairment, increase peripheral vascular resistance, mitral regurgitation, chronotropic incompetence, inadequate distribution of the blood flow to skeletal muscle and endothelial dysfunction. All these physiological characteristics of HF compromise the performance and effectiveness of PE training; however, it is known that regular PE training promotes the reversal of most of these mechanisms by the autonomic modulation it produces, contributing not only to promote an increase in PE tolerance but also to improve the patient's prognosis[18,19].

During the training session, there are numerous physiological responses that must be monitored in order to ensure the patient's safety. Thus, the following situations constitute clinical risk criteria: 1) diastolic blood pressure (DBP) ≥110 mmHg; 2) decrease in systolic blood pressure (SBP) > 10 mmHg during PE with an increase in its intensity; 3) significant ventricular or atrial arrhythmias, with or without associated signs/symptoms; 4) second or third degree atrioventricular block; 4) signs/symptoms of PE intolerance, such as subjective perception of effort (SPE) greater than 8 on the modified Borg scale, angina, severe dyspnea and changes in the electrocardiogram (ECG) suggestive of myocardial ischemia[15,17,20]. In addition to these recommendations, the existence of falls and any muscle damage, such as adverse events resulting from PE training, should also be considered.

Thus, it is understood the importance of PE training in promoting the patient's FC and also as a supporting mechanism to the treatment and clinical stabilization, and it should be implemented whenever possible and using adequate monitoring.

The purpose of this case study is to assess the safety and effectiveness of an exercise training plan targeted at a complex cardiac patient.

METHODOLOGY

Case study based on the guidelines of CAse REport (CARE), since they allow the design of a more logical and clear case study structure, presenting a proposal for its organization in several relevant items. The items were fulfilled and the necessary adaptation was made to the case in question[21].

The data presented refer to a person admitted due to decompensated heart failure in a hospital in the northern region of the country, belonging to the District of Porto; which was part of a longitudinal study of the randomized experimental type. The patient in question proved to be a particular case of interest as, during the initial training sessions, his HR always exceeded the defined safety limits. However, according to a team consensus, it was decided to keep training with adequate surveillance, in order to assess its effectiveness in cardiac modulation and increase in functional capacity. In an initial phase, this patient quickly reached HR values of around 140 bpm, which is an indication to interrupt training, however we understand that if we did so, we would greatly limit the progression in training and compromise the functional gain expected from the performance of physical exercise training. In the aforementioned study in which the patient is inserted (ERIC-HF: Early Rehabilitation in Cardiology – Heart Failure), the participants are submitted to an aerobic training protocol with progressive levels of intensity, during the hospitalization period. Functional capacity is assessed at admission using the Barthel Index (BI) and London Chest of Daily Living Activities (LCADL) and at discharge with the same instruments, plus the 6-minute walk test (P6MM). The progression through the physical exercise program is evaluated based on the recording of the training volume performed, namely the number of laps performed on the trademill, the number of meters walked and the number of steps covered, according to the training protocol (Table 2) with the time spent in each training session also being registered.

Stage	Designation
I	Breathing and calisthenic exercises in the standing or supine position
II	5-10 min of cycling
III	5-10 min of gait
IV	10-15 min of walking
V	Stage IV + 5 minutes of stairs

Table 2 – stages of the ERIC-HF protocol

The criteria for inclusion in the study are 1) being over 18 years-old; 2) hospital admission for decompensated heart failure and 3) ability to provide informed consent.

As this is an intervention in patients in the clinical stabilization phase, exclusion criteria for the implementation of the training program were defined. These criteria are manifested as temporary, that is, if the clinical condition that determines the non-start of the training program is resolved, the person can restart the training protocol again: 1) osteoarticular

pathology compromising exercise performance; 2) inotropic drugs in perfusion; 3) dysrhythmias and/or precordial pain in the last 24 hours; 4) acute pulmonary edema in the last 12 hours; 5) SBP > 180 mmHg or <80 mmHg; 6) need for continuous oxygen therapy > 3 l/min; 7) glycemic decompensation in the last 12 hours.

All data protection rules and obtaining free and informed consent were complied with. The aforementioned study is authorized by the ethics committee of the hospital where it is decorated and is registered on the clinicaltrials.gov platform with the identification number: NCT03838003.

To describe the data, the Microsoft Excel program was used, namely to build the tables and graphs.

CASE PRESENTATION

Anamnesis

Mr. F.S. is a 60-year-old male, Caucasian, married and with 2 children. There are no known previous cardiovascular events, presenting as CRF: Hypertension, Diabetes Mellitus, Dyslipidemia, Sedentary lifestyle, Stress and active smoking with about 40 units/pack/year.

The patient was admitted to hospital with severe dyspnea (characteristic of patients with decompensated HF, resulting from the accumulation of pleural exudate, which generates a limitation in chest expansion - compromised ventilation, as well as in alveolar hematosis, generating dyspnea) with about 1 week of evolution, referring to progressive loss of functional capacity and was no longer able to climb and descend stairs normally, due to the feeling of shortness of breath she had. He had edema up to the region of the knees bilaterally, having been diagnosed with inaugural heart failure. He was in NYHA class III and cardiac echocardiographic examination revealed severe depression of left ventricular function (ejection fraction of 23%).

Patient reported being previously autonomous in ADL, carrying out his work function without difficulties.

Patient also did not demonstrated knowledge about safety precautions regarding his health status, did not take any type of medication – did non-adherence to the therapeutic regimen, did not have dietary care or any type of physical activity.

Regarding the anthropometric data relevant to the determination of cardiovascular risk, Mr. F.S. had a weight of 58 Kg and a height of 1.68 meters with a BMI of 20.5. The abdominal perimeter was 91cm and the hip was 83cm.

The hospitalization lasted 13 days. After a diagnostic study, a Severe Aortic Stenosis was identified, associated with 2-vessel ischemic coronary disease, corresponding to the etiology of the HF manifested by the patient. Valvular and ischemic diseases had surgical resolution and the patient was proposed for revascularization surgery and aortic valve replacement.

A benign arrhythmia – difficult to control atrial fibrillation – was also identified. The administration of any negative chronotropic drug (decrease in heart rate) provoked a bradycardic response, and it was not possible to maintain this therapy. This problem was solved with the implantation of a definitive Pacemaker on the last day of hospitalization, before the patient was reffered to the cirgical centre.

Rehabilitation Nursing Assessment

In order to assess the functional status and degree of management capacity of the therapeutic regimen of Mr. F.S: 4 instruments were used at different times, namely: BI, LCADL, T6MM and Heart Failure Self-Care Scale (EAIC).

The LCADL scale is assessed on admission and every 2 days until discharge, in order to measure the impact that dyspnea – the main symptom of HF – has on the person's ADL performance[22,23].

The BI was assessed at admission and at discharge, allowing for the identification of other self-care limitations not resulting from HF[24.25].

The T6MM was implemented as soon as the patient presented aerobic capacity to perform it, being repeated at the time of discharge, in order to assess the evolution of their functional capacity. This is an easy-to-administer, cheap and safe test that allows you to assess submaximal functional capacity. The person should walk at the maximum possible speed[26,27]; however, since ADL are not performed at maximum speed, in an inpatient context, the person can walk at their usual speed, as some researchers have tested[28 -30]. It should be noted that gait ability is a reliable indicator of functional capacity[26, 31].

The EAIC was only assessed on admission as it allows understanding the degree of knowledge that the patient has about their clinical condition as well as the strategies use to keep themselves as healthy as possible, ending with an assessment of the person's perception of their ability to assess their overall health status. The use of this instrument allows the rehabilitation nurse to identify which areas of Knowledge and Learning Skills should be worked on[32].

Since the main rehabilitation intervention in this clinical situation focuses on aerobic exercise training, hemodynamic parameters are also evaluated allowing the assessment of the degree of clinical safety for performing the various exercises, as well as determination of the intensity of the training to be performed. These parameters correspond to the safety indicators previously mentioned, namely: systolic and diastolic blood pressure (before and immediately after the end of the training session), heart rate HR at rest and during training (with special attention to the maximum value of HR reached), SPE at rest, during training and at the end of it. In addition to these parameters, it was also verified in all training sessions the existence of some of the previously defined exclusion criteria.

Rehabilitation Nursing Diagnoses

The rehabilitation nursing diagnoses inherent in this clinical case were defined respecting the language of the International Classification for Nursing Practice (ICNP®) version 2015[33]; however some of the focuses used are not yet parameterized, so the inherent interventions they are not fully described according to CIPE. The following are focuses of attention and respective rehabilitation nursing diagnoses:

- Compromised ventilation
- Intolerance to the activity present in a high degree
- Self-care: compromised physical activity
- Exercise (integrated into self-care: physical activity)
- Moderate dependence on self-care: hygiene, toilet use and walking (due to activity intolerance)
- Potential to improve knowledge about CRF and health precautions: HF – teaching about complications of the pathological process, strategies to adopt for the effective management of the therapeutic regimen (fluid management, control of salt intake, adjusted medication, oedema surveillance, early detection of signs of impending clinical worsening).

Rehabilitation Nursing Interventions - aerobic exercise training protocol

The interventions described below refer mostly to the training plan carried out by Mr. F.S., as well as the evolution data throughout it. Several identified diagnoses (Table 3) result from the person's physical deconditioning and, as such, their resolution is largely related to the improvement in functional capacity resulting from exercise training.
The identified focuses of attention, namely 1) ventilation, 2) activity intolerance and 3) Self-care physical activity, are closely linked to each other and the resolution of formulated diagnoses, producing health gains sensitive to rehabilitation nursing care, are essentially due to the exercise plan implemented. The ventilation focus is the most relevant at an early stage, since if ventilation is compromised it will not be possible to progress in the intensity of the training plan, as oxygen supply is essential for good exercise performance and how such resolution of the diagnosis "compromised ventilation" requires immediate attention, resorting to functional respiratory re-education. After optimizing ventilation, it is possible to progress in the training plan, promoting the resolution of the diagnosis "high degree of activity intolerance", since the person will be able to obtain better physical conditioning by performing the ADL in an increasingly autonomous and unrestricted manner. , being later possible to reach higher levels of aerobic capacity, contributing to the resolution of the diagnosis "compromised physical activity self-care", whose functional content is related not only to physical capacity but also to the promotion of knowledge about exercises and their benefits .
The implementation of an exercise plan necessarily implies its planning, in accordance with internationally defined prescription criteria[17]. In this way, the planning of the implemented training protocol is presented (Figure 1):

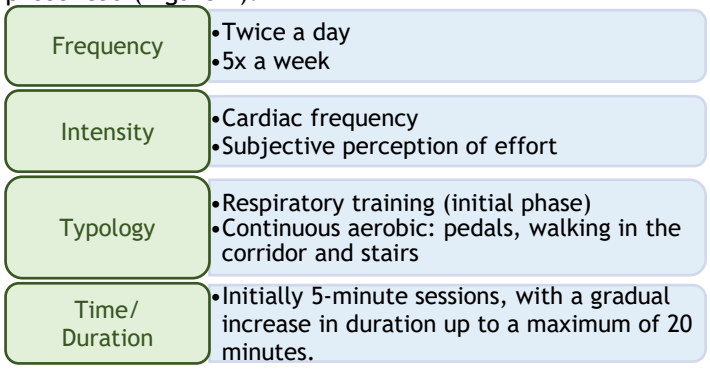


Figure 1 – Training protocol implemented

The implementation of the exercise protocol took place after the first 24 hours of hospitalization, and the patient signed an informed consent for this. In each session, the clinical safety criteria were always verified, as well as the criteria previously defined as exclusion. As this is a training program that takes place during the clinical stabilization phase, it was not always possible to implement the 2 sessions daily for clinical reasons, namely fasting for diagnostic exams or even refusal by the person on certain days.

It should be noted that the relevance of this clinical case is centered on the fact that Mr. FS has performed most of the training sessions with HR values usually outside the parameters defined as standard, however the implementation of this training protocol was targeted of consensus of the multidisciplinary team (nurses, specialist nurse in rehabilitation nursing and assistant physician) and with its implementation, the modulating effect of physical exercise on HR was notorious.

Focus: Ventilation	
Diagnosis	Interventions
Compromised ventilation	• To evaluate ventilation • To position the person • To optimize ventilation • To perform respiratory kinesitherapy (emphasis on inspiratory time) • To train the use of devices (incentive spirometer)
Evolution data	The person demonstrated the ability to perform the various techniques, improving ventilation and, consequently, their ability to subsequently start the defined aerobic training plan.

Focus: Activity intolerance	
Diagnosis	Interventions
High degree of activity intolerance (Self-care hygiene, use of the toilet and walking compromised, due to intolerance to the activity)	• To assess activity intolerance • To plan activity (training protocol + ADL) • To plan rest • To teach about energy conservation strategies • To encourage the use of breathing technique and effort re-education
Evolution data	The person showed an improvement in the level of intolerance to the activity during hospitalization, performing self-care progressively more autonomy and with less sensation of dyspnea.
Focus: Self-care: physical activity	
Diagnosis	Interventions
Self-care: compromised physical activity	• To assess self-care: physical activity • To implement aerobic training protocol • To monitor blood pressure • To monitor heart rate • To monitor oxygen saturation • To monitor heart rate • To monitor subjective perception of effort • To evaluate 6-minute walking test
Evolution data	The person complied with the training plan throughout the hospitalization, managing to progress in intensity, obtaining significant functional improvement.

Table 3 – Rehabilitation Nursing Interventions

RESULTS

The implementation of the aerobic training protocol, integrated in the aforementioned research study, allowed the sick person to improve their functional capacity and, consequently, resolve the altered nursing diagnoses. Concomitantly, and this being one of the most relevant aspects of this clinical case, the effect of cardiac modulation by exercise was noticeable. The importance of this effect is linked to the fact that the maladjusted chronotropic response is a limiting factor to the continuity of exercise, namely, a HR value above 30 bpm compared to the value at rest is an indication to discontinue the exercise. In this clinical situation, the intention is precisely to modulate the HR by exercise, since the pharmacological measures would not be fully effective, in order to allow the sick person to improve their FC.

The planning of the sessions with the respective volume of training performed is presented below, as well as the vital parameters evaluated - important in determining the intensity of the training and its safety (Table 4).

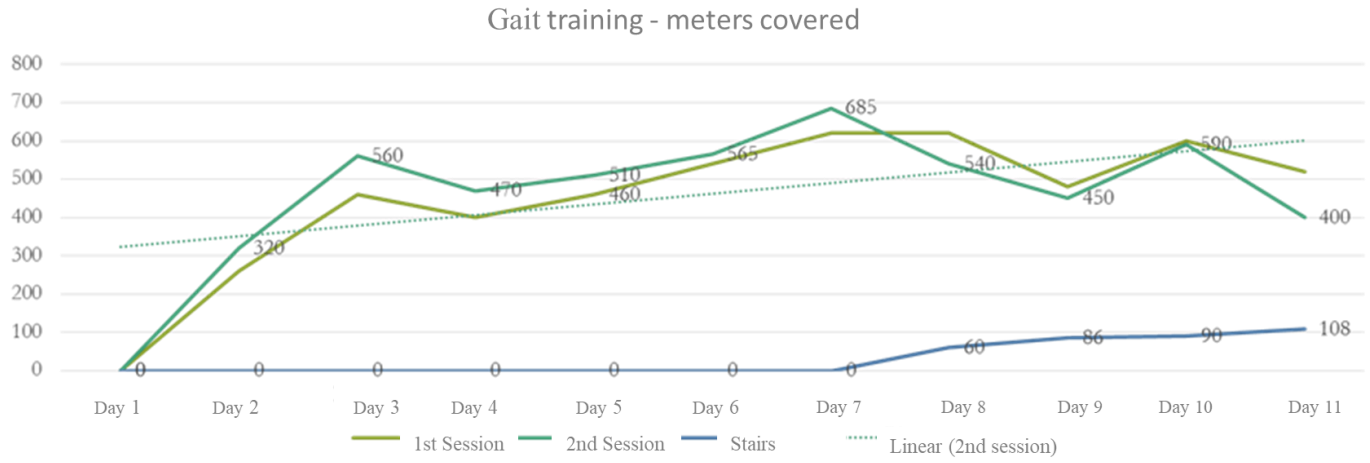
According to the data presented in Table 4, it is verified that Mr. FS performed bidaily training on most days, reaching a progressively greater training volume and exercise time in each session, maintaining a speed of about 3km/h on the march. Regarding the hemodynamic parameters directly related to training safety - BP and HR - there is a tendency for the SBP values to decrease after training, as well as the maximum HR during exertion. It should be noted that the patient in question was not on negative chronotropic medication. The subjective perception of exertion measured by the modified Borg scale is manifested in a range of values considered as mild to moderate (0 to 4).

For a better interpretation of the results, two graphs representing the volume of training performed are presented below, namely the number of meters covered (Graphic 1) and the variation in HR at rest and during effort (Graphic 2).

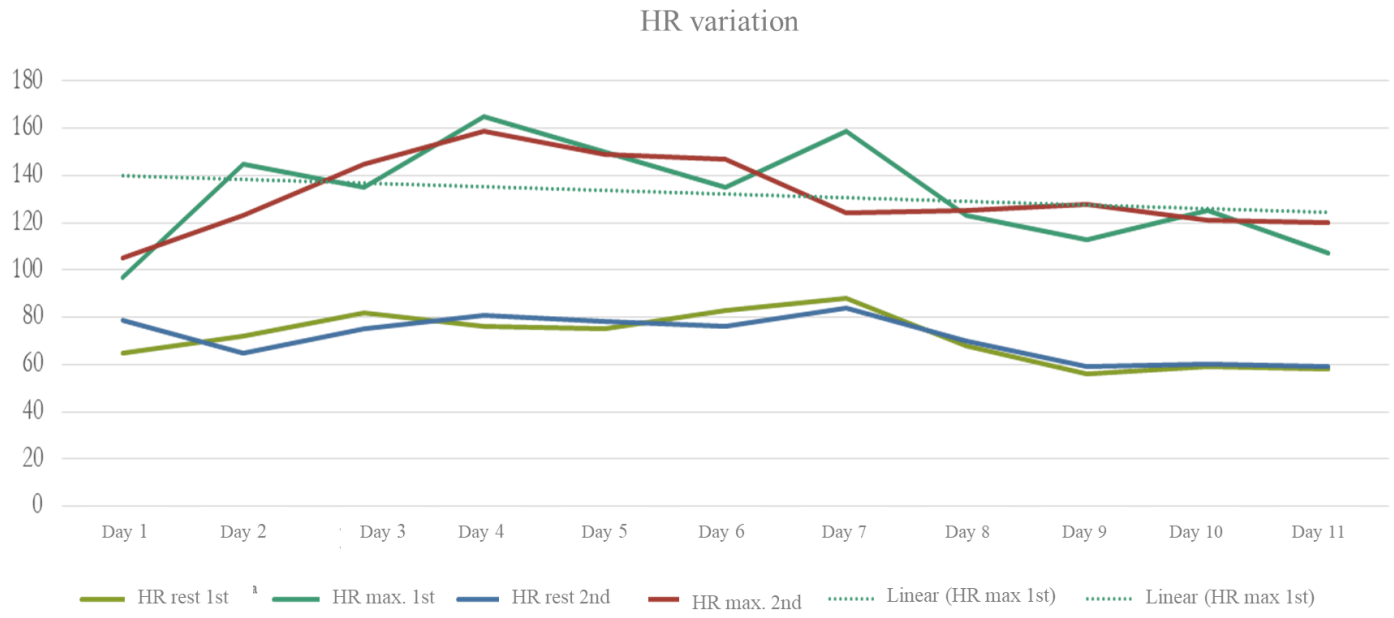
Date	Stage	Duration	TA rest	CF rest	TA effort	CF maximum	Borg	Turns	Meters	Degrees
1st hospitalization week										
25-09	II	5	116/59	85	158/67	107	1	324		
25-09	II	10	121/57	79	144/72	105	1	713		
27-09	III	5	116/57	72	140/63	145	1		260	
27-09	III	7	107/59	85	125/68	123	2		320	
2nd hospitalization week										
01-10	IV	10	125/60	82	149/65	135	2		480	

01-10	IV	12	100760	73	120/67	145	5		560	
03-10	IV	7	117/65	76	141/100	165	2		400	
03-10	IV	10	96/60	75	131/62	150	1		460	
04-10	IV	12	120/56	83	107/61	135	2		540	
04-10	IV	13	119/76	76	148/76	147	4		565	
06-10	IV	12	120/62	89	137/58	159	3		620	
06-10	IV	14	98/59	84	104/64	134	2		685	
3rd hospitalization week										
07-10	IV	15	111/54	68	137/65	129	2		620	
07-10	IV	14	112/55	61	139/65	138	3		480	
08-10	IV	15	97/53	56	143/77	130	3		620	
08-10	V	20	99/51	62	121/67	127	2		645	100
10-10	V	18	106/74	59	116/73	125	2		600	120
11-10	V	17	101/66	65	109/56	107	1		400	108
11-10	IV	13	88/54	68	112/66	94	2		470	

Table 4 – Session planning, training volume performed, and vital parameters assessed



Graphic 1 - meters covered during training.



Graphic 2 – HR variation at rest and maximum

Observing the above graphics, a positive progression in training volume can be seen: progressively higher number of meters covered, adding stair training, also with a positive trend. By analyzing the second graphic, it is possible to identify two important findings: the decrease in HR on exertion and the approximation of this value to the value at rest, revealing a smaller range of values.

During hospitalization, the patient underwent 2 gait tests, one on the 1st day, being able to walk for 6 minutes, occurring on the 4th day of hospitalization and the second on the date of discharge. The results are shown in Table 5:

	Distance	Initial TA	CF Initial	Initial Borg	Final TA	CF Maximum	Borg final
1st test	210	116/67	79	1	125/68	105	4
2nd test	295	100/59	59	0	112/70	84	2

Table 5 – Results for the T6MM

It can be verified, by analyzing Table 5, a positive difference between the 2 tests, of 85 meters, as well as a negative difference in the subjective perception of effort of 2 values. Also HR and TA values show a decrease between the 2 tests.

DISCUSSION

Based on the results presented, it is clear that the implementation of the ERIC-HF training protocol in Mr. F.S. may have been decisive in the modulation of HR, also promoting an improvement in his functional capacity measured by the T6MM.

The effect of aerobic training on the autonomic nervous system translates into a modulation of HR, that is, an adaptation of muscle fibers and sympathetic stimulation during activity, so that an unreasonably high HR is not reached, thus compromising the cardiac function and consequently the effectiveness of training[34]. Several studies have analyzed this modulating effect of exercise in patients with stabilized HF; however, there is no evidence in relation to patients undergoing clinical stabilization. However, we can verify that this effect is also likely to occur in patients in an inpatient context, contributing this as another factor that corroborates the beneficial effect of exercise training.

Clearly, the pharmacological therapy implemented during hospitalization allows contributing to the patient's clinical stabilization; however the drugs administered to this person have no potential effect in terms of HR modulation, since were not prescribed beta-blockers or other drugs with negative chronotropic effect.

Regarding functional capacity, the difference of 85 meters in the distance walked between the 2 tests performed by the patient translates into a considerable improvement, which we can classify as clinically significant[35-38]. Walking ability is accepted as an excellent indicator to infer autonomy in performing ADL and consequently infer about their functional capacity.

The joint analysis of these hemodynamic and functional parameters, such as HR and FCmeasured by the T6MM, are fundamental to understand that even in a phase of clinical instability, the specialized and differentiated intervention of the rehabilitation nurse can be decisive, especially in patients with pathologies that limit self-care such as HF.

Despite the evidence of a significant gain in functional capacity and the verified cardiac modulation, it is important to carry out the analysis of other similar clinical cases in patients included in the aforementioned study, so that it is possible to verify whether it is in fact a trend or whether these results may be associated with specific individual characteristics of Mr. FS

FINAL CONSIDERATIONS

This case study allowed us to validate the effectiveness of the rehabilitation nursing interventions in this patient, within the scope of the planning and implementation of physical exercise training aimed at cardiac patients undergoing clinical stabilization. Since the competence in physical exercise is included in the profile of the specialist nurse in rehabilitation nursing, it is essential to develop more rehabilitation programs in this direction and with evidence of health gains for the patient, sensitive to nursing care.

Throughout the implemented program, it was essential to assess the patient's progress in terms of exercise tolerance and autonomy to perform activities of daily living, due to a reduced sensation of dyspnea. It was essential to monitor these gains through the various functional assessment instruments, and it was also essential to strictly record the various training sessions, with regard to the volume, frequency and type of training performed by the patient, as a way of confirming the rigor of the planning of the exercise.

No adverse events arising from the implementation of the training protocol were recorded, thus revealing the safety of the implemented rehabilitation care, according to the previously defined planing.

More studies are needed and with more numerous samples, in order to unequivocally validate the impact that physical exercise training can have on cardiac modulation and on the promotion of functional capacity.

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FUNCIONALIDADE E QUALIDADE DE VIDA EM IDOSOS SUBMETIDOS A ARTROPLASTIA TOTAL DO JOELHO

FUNCTIONALITY AND QUALITY OF LIFE IN ELDERLY PEOPLE SUBMITTED TO TOTAL KNEE ARTHROPLASTY

FUNCIONALIDAD Y CALIDAD DE VIDA EN ANCIANOS SOMETIDOS A ARTROPLASTIA TOTAL DE RODILLA

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RESUMO

Objetivo: Avaliar a perceção da funcionalidade do joelho e a qualidade de vida relacionada à saúde (QVRS) em idosos submetidos a artroplastia total do joelho (ATJ).

Métodos: Estudaram-se 40 pacientes em dois momentos de avaliação: no pré-operatório e oito semanas após cirurgia. A QVRS foi avaliada através do MOS SF-36 v2 (Medical Outcomes Study 36-Item Short-Form Health Survey) e a perceção da funcionalidade do joelho através do KOOS (Knee injury and Osteoarthritis Outcome Score).

Resultados: Amostra (71,6±8,1 anos) maioritariamente feminina (62,5%). Os resultados do MOS SF-36 v2 revelam uma melhoria em todas as dimensões da saúde física na segunda avaliação (p <0,05). No domínio da saúde mental também houve melhoria em todas as dimensões, à exceção da vitalidade. A funcionalidade do joelho melhorou nas subescalas: sintomas (p=0,015), dor (p <0,001) e qualidade de vida (p <0,001).

Conclusão: Pacientes avaliados oito semanas após ATJ revelaram melhorias na saúde autopercebida, qualidade de vida, desempenho físico e dor.

Descritores: Qualidade de Vida; Osteoartrite do Joelho; Artroplastia do Joelho.

RESUMEN

Objetivo: Evaluar la percepción de la funcionalidad de la rodilla y la calidad de vida relacionada con la salud (CVRS) en ancianos sometidos a artroplastia total de rodilla (ATR).

Métodos: Se estudiaron 40 pacientes en dos momentos de evaluación: en el preoperatorio y ocho semanas después de la cirugía. La CVRS se evaluó utilizando el MOS-SF-36 v2 (Medical Outcomes Study 36-Item Short-Form Health Survey) y la percepción de la funcionalidad de la rodilla a través del KOOS (Knee injury and Osteoarthritis Outcome Score).

Resultados: Muestra (71,6 ± 8,1 años) en su mayoría mujeres (62,5%). Los resultados del MOS SF-36 v2 sugieren mejoras en todas las dimensiones de la salud física en la segunda evaluación (p <0.05). En la salud mental también ha habido mejoras en todas las dimensiones, excepto la vitalidad. La funcionalidad de la rodilla mejoró en las subescalas: síntomas (p = 0.015), dolor (p <0.001) y calidad de vida (p <0.001).

Conclusión: Los pacientes evaluados ocho semanas después de ATR revelaron mejoras en la salud percibida, la calidad de vida, el rendimiento físico y el dolor.

Descriptores: Calidad de vida; Osteoartritis de la Rodilla; Artroplastia de Reemplazo de Rodilla.

ABSTRACT

Objective: To evaluate perception of knee functionality and health-related quality of life (HRQL) in elderly patients submitted to total knee arthroplasty (TKA).

Methods: 40 patients were studied at two moments of evaluation: in the preoperative period and eight weeks after surgery. HRQL was assessed using the MOS-SF-36 v2 (Medical Outcomes Study 36-Item Short-Form Health Survey) and Knee Injury and Osteoarthritis Outcome Score (KOOS).

Results: Sample (71.6 ± 8.1 years), mostly female (62.5%). The SF-36 v2 MOS results show an improvement in all dimensions of physical health in the second evaluation (p <0.05). In the field of mental health there has also been improvement in all dimensions, except vitality. The functionality of the knee improved in the subscales: symptoms (p = 0.015), pain (p <0.001) and quality of life (p <0.001).

Conclusion: Patients evaluated eight weeks after TKA showed improvements in self-perceived health, quality of life, physical performance and pain.

Keywords: Quality of Life; Osteoarthritis Knee; Arthroplasty Replacement Knee.

INTRODUCTION

Osteoarthrosis (OA) is defined as a degenerative clinical condition characterized by the progressive loss of articular cartilage, which may affect the subchondral bone and compromise the entire joint[1]. OA is one of the most frequent chronic diseases of our time and its incidence is expected to continue to increase at the same time as the increase in average life expectancy. It was the most common joint disease in the world and one of the main causes of chronic incapacity, especially in the elderly population[2]. Age is the main risk factor for the development of OA since the changes that occur at the cellular and tissue level during the aging process make the joints more susceptible to damage and unable to maintain homeostasis[3].

As the largest and most requested load joint in the human body, the knee is responsible for most OA situations, symptomatically affecting 45% of elderly people[4]. As a load joint, the knee is quite susceptible to aging changes that enhance the development of arthrosis, of which we can highlight: changes in proprioception and balance, sarcopenia and increased fat mass, osteoporosis, meniscal degeneration and less joint hydration[3].

On a symptomatic level, knee OA causes joint pain and stiffness, edema, progressive varus or valgus deformity and slow and limp gait[3,4]. Limitations in walking, climbing and descending stairs and squatting seriously interfere with life and leisure activities. Furthermore, it impairs other aspects of elderly people's lives, such as social interaction, physical and mental functioning and sleep quality[5]. In general, musculoskeletal problems interfere with the quality of life (QL), which can be a cause of early disability or absence from work due to illness[6].

The symptoms and limitations caused by the pathology have a significant impact on health-related quality of life (HRQOL)[5], so it is essential to relieve pain and control symptoms by medical or surgical treatment, varying according to with the degree of the disease, the level of disability, occupation, age, among other factors.

In addition to arthroscopy, osteotomy and partial arthroplasty, surgical treatment for knee OA includes total knee arthroplasty (TKA). In elderly people with no work activity, and with advanced OA, this last alternative was the most adequate, economical and safe treatment[7].

The main objectives of TKA are to reduce pain complaints, improve joint range and gait capacity, allowing patients to autonomously acquire their mobility earlier and improve their QL. Thus, after surgery, it is important to quantify these health gains through research, either by analyzing the available scientific evidence or by carrying out new studies.

A study carried out with 52 elderly women interviewed at 3 and 6 months after TKA concluded that, in both postoperative evaluations, the parameters that improved the most were body pain, physical function, vitality and social function[8]. On the contrary, mental health and emotional performance still did not reach normal values at 6 months after surgery.

A recent systematic review analyzed 31 studies on QL after TKA, concluding that TKA provides a better QL early after the surgical procedure, essentially by reducing pain and increasing functionality[9]. The preoperative factors that correlate most positively with QL in the postoperative period were lss claudication, better sleep quality, levels of physical activity practiced before the procedure and adequate family and social support[9].

Several studies were carried out using specific instruments to assess the functionality of the knee, namely the KOOS. One of them had 39 patients undergoing TKA as participants, who were evaluated through measures of functional performance, namely using the 6-minute walk test, Timed Up and Go and KOOS[10]. Participants were evaluated before surgery and at three subsequent times (1, 3 and 6 months after TKA). The investigation revealed worse results in the 6-minute walk test and in the Up and Go test after one month, with the results having improved significantly afterwards at 3 and 6 months. As for the KOOS values, the investigation concluded that there was an increase in knee functionality at all moments of follow-up, except for the subscale related to sports and leisure activities, whose improvement was only noticeable after 3 months[10]. The authors mention that self-reported measures are overrated by users at 30 days, probably due to improvements in pain relief, but that this is not reflected in the functional performance assessed by the 6-minute walk and the Timed Up and Go test[10].

Taking into account the above, we developed an investigation that aimed to evaluate the perception of functionality/problems in the knee and HRQL in elderly people undergoing TKA. They constituted our specific goals. (i) Characterize patients according to sociodemographic variables (gender, age) and body mass index (BMI); (ii) Compare the results obtained in the preoperative period and eight weeks after surgery in relation to the perception of the patients' QL (iii) Compare the results obtained in the preoperative period and eight weeks after surgery in relation to the perception of the degree of knee functionality.

METHOD

Taking into account the objectives of the investigation, a quantitative and prospective longitudinal study was designed, with two evaluation

moments: before the surgery and 8 weeks after the surgical procedure.

The sample consisted of all elderly people diagnosed with knee OA who consecutively underwent TKA at the Hospital Terra Quente (HTQ) for a period of 6 months. The study excluded patients for knee prosthesis review, patients undergoing partial knee prosthesis, patients who underwent TKA whose underlying pathology was not knee OA, and patients who had the following postoperative complications: infection, wound dehiscence surgery and joint effusion. It should be noted that all patients who participated in the study had, during hospitalization, rehabilitation nursing care, namely in terms of positioning of the intervened limb, getting up from bed for the first time after surgery, recovery of joint range and teaching and preparation for discharge.

In addition to the gender, age and BMI variables, the following constructs were included in the study: (i) Health-related quality of life, assessed through the Medical Outcomes Study 36-Item Short-Form Health Survey (MOS SF-36 v2) ; (ii) Perception of functionality/knee problems, assessed using KOOS.

The MOS SF-36 v2 is used to investigate the quality of life of individuals with or without disease and is structured into 36 items. Its completion time is in average 10 minutes and can be completed by the individual or by interview. Its quality of life measures are considered the gold standard in health-related studies[11]. The SF-36 v2 assesses quality of life in the physical and mental component. The physical component includes the following dimensions: Physical function (FF), Physical performance (PP), Body pain (BP) and Health in general (HG). In turn, the mental component integrates the following dimensions: Vitality (VT), Social Function (SF), Emotional Performance (EP) and Mental Health (MH).

Regarding the KOOS questionnaire, it aims to measure the perception of functionality/knee problems. Its average filling time is 10 minutes and aims to assess five dimensions that are scored separately: pain (9 items) symptoms other than pain (7 items), activities of daily living (7 items), sports and leisure activities (5 items) and quality of life related to knee functionality (4 items). Dimension scores are presented on a positive orientation scale where 0 corresponds to extreme problems and 100 corresponds to no knee problems.

Several studies show that the KOOS questionnaire has good evidence of reliability and construct validity[12,13].

The study project was approved by the HTQ administration and all users agreed to participate in the investigation in a free and informed way, signing the informed consent. To avoid biases, data were collected by the same investigator in both evaluation moments.

To process the information, the statistical program Statistical Packhage for the Social Sciences (SPSS) was used. The classic procedures of descriptive and inferential statistics were followed. The t-test for paired samples was used for a reference level of significance of $p < 0.05$.

RESULTS

The sample consisted of 40 elderly people, mostly female (62.5%). We found an average age close to 72 years and an average BMI of 27.2Kg/m2. The subjective health status was assessed by the first question of the SF-36 v2, a question that does not integrate any dimension of the instrument and is considered an item of global assessment of self-perceived health. As shown in Table 1, there was a more favorable trend of responses during the second assessment moment (M2), where 55% of respondents reported that their health was Good, a value that compares with the 35% obtained in the first assessment (M1). On the other hand, there was a decrease between M1 and M2 in the Fair (52.5% vs 37.5%) and Poor (7.5% vs 2.5%) health categories.

	Sample	
Gender		
Female, *n (%)*	25 (62.5)	
Male, *n (%)*	15 (37.5)	
TOTAL, *n (%)*	40 (100.0)	
Age, (M±DP)	71,6±8,1	
IMC, (M±DP)	27.2±3.9	
In general, I would say that your health is:	Moment 1	Moment 2
Great, *n (%)*	1 (2,5)	1 (2,5)
Very good, *n (%)*	1 (2,5)	1 (2,5)
Good, *n (%)*	14 (35.0)	22 (55.0)
Reasonable	21 (52.5)	15 (37.5)
Weak, *n (%)*	3 (7,5)	1 (2,5)
TOTAL, *n (%)*	40 (100.0)	40 (100.0)

Table 1- Study participants distributed by gender, mean age and mean BMI values. Results obtained for the subjective state of health

Table 2 compares the means obtained in the physical component of the SF-36 v2 (FF, DF, DC and SG) in the two evaluated moments. There were statistically significant improvements ($p < 0.05$) in all dimensions of the physical component at the second time of evaluation.

	Moment 1 *(M±DP)*	Moment 2 *(M±DP)*	*p*
Physical function (FF)	48.8±7.0	53.6±11.1	0.005
Physical performance (PP)	52.5±11.0	58.4±11.2	0.001
Body pain (BP)	42.2±12.4	71.6±12.0	<0.001
Health in general (HG)	61.9±11.2	67.8±10.0	<0.001

M- Average; DP-Standard deviation; p- Significance t test for paired samples

Table 2- Averages obtained in the two evaluation moments for the dimensions Physical function, Physical performance, Body pain and Health in general

Regarding the mental component of the SF-36 v2, and analyzing the variations in the means recorded in M1 and M2 in the different subscales (VT, SF, EP, MH) through the t test for paired samples (Table 3), we concluded that there was a significant improvement (p <0.05) in quality of life in all dimensions, except vitality (VT) (p=0.062).

	Moment 1	Moment 2	p
	(M±DP)	*(M±DP)*	
Vitality (VT)	58.9±7.2	62.0±8.3	0.062
Social function (SF)	54.3±13.4	69.2±9.7	<0.001
Emotional performance (EP)	54.5±14.0	66.5±12.6	<0.001
Mental health (MH)	55.3±11.0	64.0±7.5	<0.001

M- Average; DP-Standard deviation; p- Significance t test for paired samples

Table 3- Averages obtained in the two evaluation moments for the Vitality, Social Function, Emotional Performance and Mental Health dimensions

The comparison between the mean values of the first and second assessments related to the KOOS questionnaire (Table 4) reveals statistical significance in the symptoms, pain and quality of life dimensions. The difference in means observed for activities of daily living and sport/leisure activities did not show statistical relevance.

	Moment 1	Moment 2	p
	(M±DP)	*(M±DP)*	
Symptoms	62.4±15.4	66.5±11.9	0.015
Pain	58.6±12.5	71.8±15.6	<0.001
Activities of Daily Life	61.7±13.2	64.0±11.1	0.060
Sports/leisure activities	13.6±3.0	13.9±11.4	0.885
Quality of life	43.8±11.4	49.9±11.4	<0.001

M- Average; DP-Standard deviation; p- Significance t test for paired samples

Table 4 - Comparison of the means obtained in the two evaluation moments in the KOOS questionnaire

DISCUSSION

The first topic of discussion refers to the fact that the sample studied is mostly made up of female elements. In epidemiological terms, this result is corroborated by studies that found a higher prevalence of OA in women, namely 72%[14] and 88.5%[15]. These results may be explained by postmenopausal osteoporosis and by the fact that women have less muscle mass than men[16,17].

Regarding the BMI, an average value of 27.2 kg/m2 was obtained. Excess weight, due to the increase in intra-articular pressure it causes, is considered an increased risk factor for the development of knee OA. The results of the Framingham study show that women who lost about 5 kg of their weight had a 50% reduction in the risk of developing symptomatic OA of the knee[18]. On the other hand, weight loss has been associated with improved physical function and pain reduction in multiple studies[19,20].

As for the SF-36 v2, we obtained significant changes in the direction of improving health status and QL, at the second time of assessment, in relation to all dimensions of the physical component, and to all dimensions of the mental component, except for vitality. Fracasso and Kaipper (2012) studied the perception of functionality in activities of daily living and QL in patients undergoing TKA and verified, through the application of the MOS SF-36, that there was an improvement in symptoms, as well as in functional limitations with a tendency to improvement in quality of life 15 days after surgery[21]. A systematic review concluded that TKA improves QL especially with regard to pain and functionality[9].

In our study, the analysis of the perception of functionality/problems in the knee was performed using KOOS, concluding that there was a significant improvement in symptoms, pain and QL. Our results are in line with those reported by a study that evaluated 13 patients preoperatively and at 4 weeks after surgery, concluding that there was a significant decrease in pain over this period of time[22]. Stevens-Lapsley and collaborators developed a study with 39 patients undergoing TKA, evaluated at three different times (1, 3 and 6 months after surgery) through measures of functional performance, namely using the 6-minute gait test, Timed Up and Go and KOOS questionnaire[10]. As for the KOOS results, the investigation concluded there was an increase in knee functionality at all times of follow-up, with the exception of the subscale related to sports and leisure activities, whose improvement was only noticeable after the assessment at 3 months[10].

CONCLUSION

Regarding the QL assessed by the MOS SF-36 v2 it was concluded that there were statistically significant improvements (p<0.05) in all dimensions of the physical component (physical function, physical performance, body pain and health in general) at the second moment of evaluation. In the mental component there was improvement (p<0.05) in all dimensions (social function, emotional performance and mental health), except for vitality (p=0.062).

For the dimensions of the questionnaire used to assess the perception of functionality/knee problems (KOOS), it was found that in the second assessment there was a tendency to decrease pain and improve symptoms.

Taking into account that the concept of quality of life is related to the person's health status and that the pain and functional limitation caused by OA negatively

influence the well-being and performance of activities of daily living, it can be concluded that TKA contributes to the improvement of the person's physical quality and performance. It was also observed that TKA, in addition to revealing an improvement in physical performance, also contributed significantly to the improvement of the participants' emotional and social activity.

Our study has several limitations, of which we highlight those arising from a non-probabilistic sampling process with a small number of participants, which hinders the generalization of the results. However, the data we present may serve as comparative values in rehabilitation programs for patients undergoing TKA. On the other hand, and given the small number of studies carried out in Portugal that used the KOOS questionnaire, this study may encourage the use of this tool in the assessment of knee functionality, at the level of specialized practice in rehabilitation nursing. It is suggested to carry out further studies with larger samples and with different follow-up time intervals. It is also suggested, in future studies, the inclusion of other variables related to the rehabilitation process, namely if it was continued after discharge from the hospital unit.

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