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A INTERVENÇÃO DOS ENFERMEIROS ESPECIALISTAS EM ENFERMAGEM DE REABILITAÇÃO NO RISCO DE ÚLCERA POR PRESSÃO

THE INTERVENTION OF SPECIALIST NURSES IN REHABILITATION NURSING IN THE RISK OF PRESSURE ULCERS

LA INTERVENCIÓN DE LOS ENFERMEROS ESPECIALISTAS EN ENFERMERÍA DE REHABILITACIÓN EN EL RIESGO DE ÚLCERA POR PRESIÓN

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RESUMO

Introdução: As Equipas de Cuidados Continuados Integrados dão resposta a pessoas dependentes, que não se deslocam autonomamente. A mobilidade e a atividade são áreas de atenção do enfermeiro especialista em enfermagem de reabilitação e fatores relacionados com o risco de úlcera por pressão. Este estudo teve como objetivo avaliar a influência da intervenção dos enfermeiros especialistas em enfermagem de reabilitação na redução do risco de úlcera por pressão, avaliado através da escala de Braden, em utentes integrados numa Equipa de Cuidados Continuados Integrados em programa de reabilitação.

Metodologia: Estudo observacional, descritivo, exploratório, retrospetivo, realizado numa amostra de 60 utentes acompanhados numa Equipas de Cuidados Continuados Integrados do Norte de Portugal, referenciados para reabilitação, com alta no período compreendido entre 1 janeiro de 2021 e 31 de dezembro de 2022.

Resultados: Os participantes tinham em média 78 anos, com diagnósticos médicos mais frequentes: doença cérebro vascular, doenças do sistema nervoso e do sistema osteoarticular. Observou-se uma melhoria nos valores médios da escala de Braden, passando de 14,7 (alto risco) para 17,7 (baixo risco) (t(58) = 8,267, p<,001, d Cohen= 1,06) e da Tabela Nacional da Funcionalidade, passando o valor de 126 na admissão para 104 na alta. Verifica-se ainda uma relação estatística muito forte entre a melhoria no valor das subescalas de Braden atividade (r(58) = 0,867, p <,001) e mobilidade (r(58) = ,820, p <,001) com o valor final da Escala de Braden no momento da alta.

Discussão: Os resultados revelaram uma correlação muito forte e positiva entre a melhoria das subescalas atividade e mobilidade, áreas que foram alvo de intervenção do enfermeiro especialista em enfermagem de reabilitação, com o valor final da Escala de Braden.

Conclusão: Este estudo revelou que as intervenções implementadas tiveram influência na melhoria da funcionalidade, da mobilidade e da atividade, fatores intrinsecamente ligados à intervenção do enfermeiro especialista em enfermagem de reabilitação. Sendo a mobilidade e a atividade dois dos seis parâmetros avaliados pela escala de Braden, infere-se assim que se obteve ganhos na prevenção de úlceras por pressão, refletindo-se em ganhos para o utente, familiares, cuidadores e para o Serviço Nacional de Saúde.

Descritores: Úlcera por Pressão, Enfermagem em Reabilitação, Autocuidado, Risco

ABSTRACT

Introduction: The Integrated Continuing Care Teams respond to dependent people who do not move autonomously. Mobility and activity are areas of attention for nurses specialized in rehabilitation nursing and factors related to the risk of pressure ulcers. This study aimed to evaluate the influence of the intervention of specialist nurses in rehabilitation nursing in reducing the risk of pressure ulcers, assessed using the Braden scale, in patients integrated in an Integrated Continuing Care Teams in a rehabilitation program.

Methodology: Observational, descriptive, exploratory, retrospective study, carried out on a sample of 60 patients followed in an Integrated Continuing Care Teams from northern Portugal, referred for rehabilitation, discharged in the period between January 1, 2021, and December 31, 2022.

Results: The participants were on average 78 years old, with more frequent medical diagnoses: cerebrovascular disease, diseases of the nervous system and osteoarticular system. There was an improvement in the mean values of the Braden scale, from 14.7 (high risk) to 17.7 (low risk) (t(58) = 8.267, p<.001, d Cohen = 1.06) and in the National Table of Functionality, from 126 at admission to 104 at discharge. There is also a very strong statistical relationship between the improvement in the value of the Braden subscales activity (r(58) = 0.867, p <.001) and mobility (r(58) = .820, p <.001) with the final value of the Braden Scale at the time of discharge.

Discussion: The results revealed a very strong and positive correlation between the improvement of the activity and mobility subscales, areas that were the target of intervention by the nurses specialized in rehabilitation nursing intervention, with the final value of the Braden Scale.

Conclusion: This study revealed that the interventions implemented by the nurses specialized in rehabilitation nursing had an influence on the improvement of functionality, mobility and activity, factors intrinsically linked to the intervention of the nurses specialized in rehabilitation nursing. Since mobility and activity are two of the six parameters evaluated by the Braden scale, it is thus inferred that gains were obtained in the prevention of pressure ulcers, reflected in gains for the user, family members, caregivers and the National Health Service

Descriptors: Pressure ulcer, Rehabilitation Nursing, Self-care, Risk

RESUMEN

Introducción: Los Equipos Integrados de Atención Continuada responden a las personas dependientes, que no se desplazan de forma autónoma. La movilidad y la actividad son áreas de atención para los enfermeros especializados en enfermería de rehabilitación y factores relacionados con el riesgo de úlceras por presión. Este estudio tuvo como objetivo evaluar la influencia de la intervención de enfermeras especialistas en enfermería de

rehabilitación en la reducción del riesgo de úlceras por presión, evaluado mediante la escala de Braden, en pacientes integrados en un Equipo Integrado de Atención Continuada en un programa de rehabilitación.

Metodología: Estudio observacional, descriptivo, exploratorio, retrospectivo, realizado sobre una muestra de 60 pacientes seguidos en un Equipos Integrados de Atención Continuada en el norte de Portugal, remitidos para rehabilitación, dados de alta en el período comprendido entre el 1 de enero de 2021 y el 31 de diciembre de 2022.

Resultados: os participantes tenían una edad media de 78 años, con diagnósticos médicos más frecuentes: enfermedad cerebrovascular, enfermedades del sistema nervioso y del sistema osteoarticular. Hubo una mejora en los valores medios de la escala de Braden, de 14,7 (alto riesgo) a 17,7 (bajo riesgo) (t(58) = 8,267, p<,001, d Cohen = 1,06) y en la Tabla Nacional de Funcionalidad, de 126 al ingreso a 104 al alta. También existe una relación estadística muy fuerte entre la mejora en el valor de las subescalas de actividad de Braden (r(58) = 0,867, p <,001) y movilidad (r(58) = 0,820, p <,001) con el valor final de la Escala de Braden en el momento del alta.

Discusión: Los resultados revelaron una correlación muy fuerte y positiva entre la mejora de las subescalas de actividad y movilidad, áreas que fueron objeto de intervención de los enfermeros especializados en enfermería de rehabilitación, con el valor final de la Escala de Braden.

Conclusión: Este estudio reveló que las intervenciones implementadas influyeron en la mejora de la funcionalidad, la movilidad y la actividad, factores intrínsecamente ligados a la intervención de los enfermeros especializados en enfermería de rehabilitación. Dado que la movilidad y la actividad son dos de los seis parámetros evaluados por la escala de Braden, se infiere que se obtuvieron ganancias en la prevención de las úlceras por presión, reflejadas en ganancias para el usuario, los familiares, los cuidadores y el Servicio Nacional de Salud.

Descriptores: Úlcera por Presión, Enfermería en Rehabilitación, Autocuidado, Risco

INTRODUCTION

The demographic change associated with the ageing of the population and advances in healthcare has resulted in a significant number of elderly people living at home. Projections indicate that the elderly population in Portugal will grow by almost 25% by 2025 [1], which is associated with an increase in individuals with chronic illnesses and self-care dependency (1, 2, 3, 4). In this sense, the Integrated Continuing Care Teams (*Equipas de Cuidados Continuados Integrados* - ECCI), included in the National Network of Integrated Continuing Care (*Rede Nacional de Cuidados Continuados Integrados* - RNCCI), were created to respond to people in a situation of temporary or prolonged functional dependency, regardless of age, who are unable to move around independently [2]. Data from the RNCCI show that the majority (around 85%) of its users are seniors [2]. Therefore, we are faced with an elderly population in the home context, with several comorbidities, polymedicated [5], often with changes in the level of consciousness, malnutrition, dehydration, urinary and/or fecal incontinence, with functional dependence, spending most or all of the day sitting or lying down. All of these factors contribute to an increased risk of pressure ulcers (PU) [6, 7].

PUs are a public health problem and an indicator of the quality of care provided. They are a source of suffering, a reduction in the quality of life of users and their caregivers, and can lead to death [7, 8, 9, 10, 11, 12]. They are also responsible for high financial burdens for Health Services [7, 9, 10, 12, 13, 14, 15]. According to the European Pressure Ulcer Advisory Panel [EPUAP], treating a PU can cost up to 70,000 euros per year in hospitalization, additional medication, treatment products and rehabilitation [16], and the costs of preventing PU are proven to be lower than the costs of treatment [11, 14].

The European Wound Management Association (EWMA) and EPUAP strongly advocate PU prevention as a fundamental objective in health care and patient safety [11, 14], with evidence that around 95% of PUs can be prevented through early identification of the degree of risk. To this end, knowledge of the etiology and risk factors related to the development of PU are crucial to the success of a prevention plan [10], given that the incidence of PU at a national level in 2021 and 2022 in the RNCCI was 3.4% [17]. Ensuring the safety of users in healthcare is a challenge for European Union countries [10], with preventing PU occurrence being one of the strategic objectives of the National Plan for User Safety 2015-2020 [13] and 2021-2026 [18]. In this sense, it is important to adopt prevention strategies, the first step of which will be to identify risk factors, using one of the recommended assessment instruments [7, 10, 13, 18].

The Braden scale is a PU risk assessment instrument validated for the Portuguese population in 2007 by Ferreira, P. [et al] [19], and it is the instrument that is available in the SClínico Information System and in the National Network of Continuing Care Information System (SI-RNCCI) for people over 18 years old [10]. The Braden scale consists of six subscales, which assess the following dimensions: Sensory perception, Skin moisture, Activity, Mobility, Nutrition, Friction and Sliding Forces. The value attributed to each subscale varies between 1 and 4, with the exception of Friction and Sliding Forces, which has three levels, with the lowest value corresponding to a higher risk of developing PU. The Braden Scale presents two risk levels, in which the cut-off point is 16: a) High Risk of Developing PU in adults - final value ≤ 16; b) Low Risk of Developing PU in adults - final value ≥ 17. Of the various risk

factors for PU, the literature indicates that mobility and activity stand out for their relevance [7, 8].

The National Functionality Table (*Tabela Nacional de Funcionalidade* - TNF) was prepared in 2014 by the Portuguese Directorate-General for Health and implemented in the National Health Service (*Serviço Nacional de Saúde* - SNS) in 2018 with the aim of "...quantifying the degree of functionality and measuring the health gains obtained after therapeutic intervention." [20] It allows the classification of 38 items, which are grouped into five dimensions: Mobility and Self-Care; General Skills; Specific Skills; Sociability; Manipulation and Handling [20]. The TNF value varies between 0 and 152, which represent total independence and dependence, respectively.

The SNRN plays an important role in promoting the mobility and functionality of the user, since it is its responsibility to "...ensure the maintenance of the functional capacities of clients, prevent complications and avoid disabilities, as well as provide therapeutic interventions that aim to improve residual functions, maintain or restore independence in life activities, and minimize the impact of established disabilities..." [21].

Given the above, it is expected that the SNRN intervention will result in a reduction in the risk of PU, reflected in the improvement of the values of the Braden mobility and activity subscales. However, to the best of our knowledge, and based on the research carried out in different national and international databases, we were unable to find any evidence on the influence of the SNRN intervention in the prevention of PU.

Therefore, the aim of this study is to fill this gap and evaluate the influence of the SNRN intervention in the reduction of the risk of PU, assessed using the Braden scale, between the beginning and the end of the rehabilitation program in users who were discharged from an ECCI in the North of Portugal.

METHODOLOGY

An observational, descriptive, exploratory, retrospective study was carried out on a convenience sample of patients enrolled in an ECCI in the North of Portugal and discharged between January 1, 2021, and December 31, 2022. All patients referred to the ECCI who maintained a rehabilitation program from admission to discharge were included in the study. Patients referred to the ECCI for a rehabilitation program who presented only one Braden scale record or who suspended the rehabilitation program were excluded. Thus, all patients included in the study underwent a monthly Braden scale assessment, and the values corresponding to the assessment at the time of admission and discharge from the ECCI were considered for the present study. Given that almost all users were also subject to TNF assessment at the time of admission and discharge, this data was also considered in the analysis of the results. The patients included in the study were monitored in a rehabilitation program by an SNRN responsible for case management. The number of home visits was on average three per week. For each patient, an individual intervention plan was drawn up, with objectives and interventions, by professionals from the multidisciplinary team (rehabilitation nurse, doctor and social worker) together with the patient/caregiver, considering the needs identified for each patient.

To characterize the sample, the following variables were considered: Age, Sex, Caregiver, Medical Diagnosis, Length of Stay, Reason for Referral, Braden Scale values, Braden Scale Subscale values and TNF at the time of admission and discharge from the ECCI.

The data were collected through the SI-RNCCI platform and organized in a table created in Microsoft Excel®. The statistical program SPSS (Statistical Package for Social Sciences) 29 was used to analyze the results. Descriptive statistical analysis was performed by calculating the mean, frequency and percentage, and inferential analysis, the latter for a significance level of $p < .05$.

Data collection was authorized by the Clinical and Health Council of ACeS and by the Ethics Committee for Health of the Northern Regional Health Administration – opinion CE/2023/89 of 2023-10-19. This study was carried out in accordance with the required ethical and legal principles.

RESULTS

Of the 87 patients discharged from the ECCI during the study period, 62 (71%) were referred for rehabilitation. For data analysis, 60 patients (n=60) who were followed up in a rehabilitation program and discharged from the ECCI in 2021 and 2022 were included. Two patients were excluded, one for only having a Braden scale record and another for having changed the care plan, at the time of admission, to palliative care. Of the 60 patients assessed, there was an assessment of TNF at the time of admission and at discharge in 59 patients.

The average length of stay in the ECCI was 133 days, with the shortest hospitalization being 35 days and the longest being 463 days.

As previously mentioned, the type of patients referred to the ECCI due to the need for rehabilitation care presents a decrease in functional condition, with consequent impairment of activity and mobility. Therefore, the following nursing care focuses were identified in the 60 study users, according to the ICNP® taxonomy: pressure ulcer (user/caregiver knowledge about PU prevention, user/caregiver capacity about PU prevention), pain and management of the therapeutic regimen (nutrition, therapy and physical exercise). The specific SNRN care focuses on the users included in this

study were, according to the ICNP® taxonomy: muscle movement, joint stiffness, body balance, self-care (transferring, positioning, walking) and activity intolerance. The SNRN interventions focused on direct care to the user and on teaching, instruction and training to the user/caregiver so that continuity of care was possible. These were in line with the identified nursing diagnoses and the defined objectives. Nursing interventions were implemented within the scope of the specific SNRN competencies, which were: performing/teaching/instructing and training on articular muscle exercises, balance training, transfer and positioning techniques, walking, walking with a walking aid, climbing/descending stairs, adaptive strategies and prescribing support products. Interventions within the scope of general competencies were: assessment of nutritional status and referral to nutrition service whenever necessary, teaching user/caregiver about PU prevention and management of the therapeutic regimen.

CHARACTERIZATION OF PARTICIPANTS

The average age of the study participants was 78 years old and the median was 83.5 years old, with the youngest age being 23 years old and the oldest being 92 years old.

Table 1 presents the sociodemographic and clinical data of the participants.

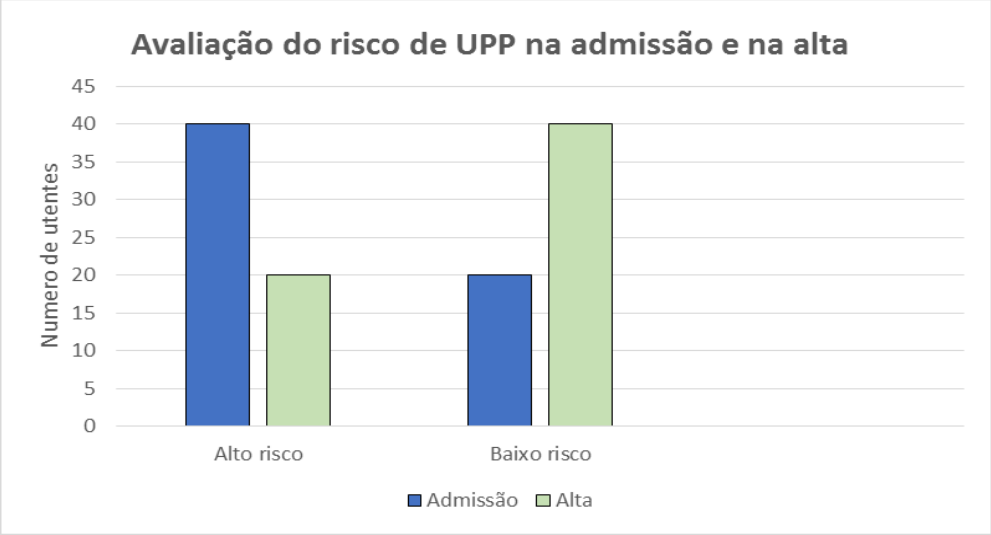
Table 1 - Sociodemographic and clinical data of participants

Variables	n	%
Gender		
Male	26	43%
Female	34	57%
Age range (in years)		
0-17	0	0%
18-49	4	6.50%
50-64	4	6.50%
65-79	9	15%
>=80	43	72%
Caregiver		
Children/daughter-in-law/son-in-law/nephew	26	44%
Spouse/sibling/brother-in-law	20	33%
Formal	8	13%
Mother/father	4	7%
No Caregiver	2	3%

Variables	n	%
Medical diagnosis		
Cerebrovascular disease	17	28%
Nervous System disease	17	28%
Osteoarticular System disease	16	27%
Cardiovascular disease	2	3%
Respiratory System disease	2	3%
Oncological disease	1	2%
Kidney disease	1	2%
Others	4	7%

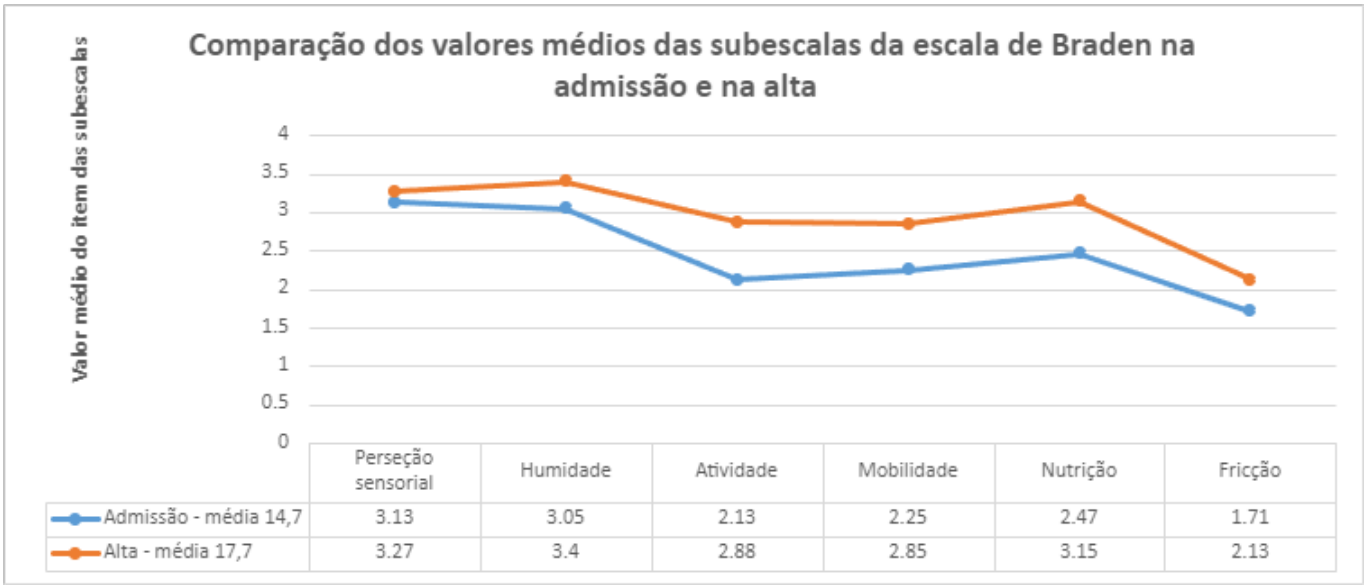
Graph 1 shows the comparison between the number of patients with high and low risk of PU at the time of admission and at discharge. At admission (n=40) were at high risk of PU and (n=20) were at low risk of PU. At the time of discharge, the values reduced by 50% in high-risk patients according to the Braden scale.

Graph 1 - Comparison between the number of users with high and low risk of PU at the time of admission and discharge



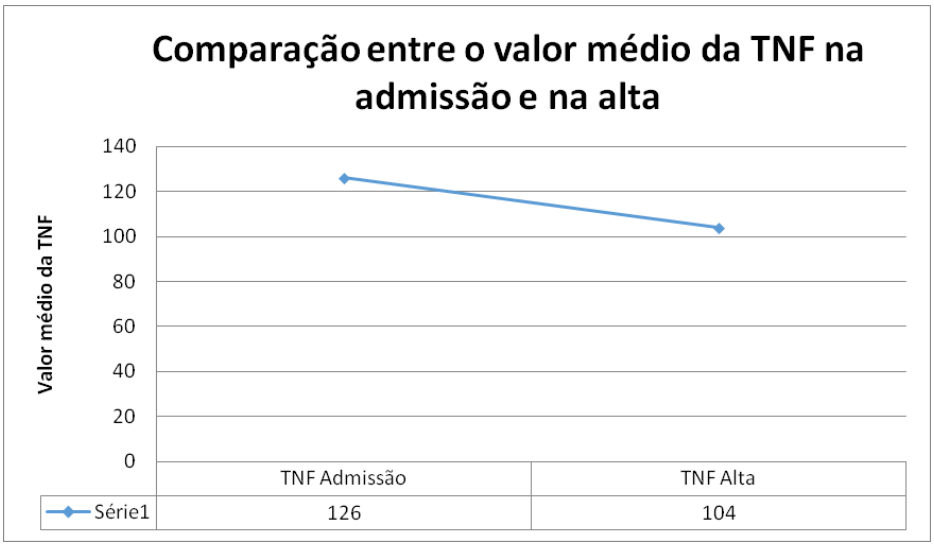
Graph 2 shows a comparison of the mean values of the Braden subscales at admission and discharge.

Graph 2 - Comparison of mean values of the Braden subscales at admission and discharge



Graph 3 shows the comparison of the values obtained by the TNF, at admission and discharge.

Graph 3 - Comparison between the mean TNF value at admission and discharge



INFERENTIAL ANALYSIS OF THE VARIABLES UNDER STUDY

In this sample women are older than men (Mwomen = 84,44; Mmen = 69.38); *t*(57) =

-3.541, *p*<.001, *d* Cohen= .102.

The data reveal statistically significant differences in the analysis of the overall value of the Braden scale between the time of admission (M = 14.72) and the time of discharge (M = 17.70); t(58) = 8.267, p<.001, Cohen's d= 1.06.

In this study, it was found that the shorter the length of stay, the higher the final value on the Braden scale r (58) = -.381, p =.003. It was also possible to observe that the higher the TNF value on admission and discharge, the lower the initial value on the initial Braden scale r (57) = -.654, p <.001 and final Braden scale r (57) = -.698, p <.001. Women have a higher overall Braden scale score than men (Mwomen = 18.56) and men (Mmen = 16.58); t(57) = -1.794, p=.0039, Cohen's d= -.467. Men have a higher TNF score at discharge (Men (M = 117.08)) than women (M = 93.42); t(57) = -1.794, p=.006, Cohen's d= .687.

The analysis of the data reveals a very strong statistical relationship between the improvement in the Braden activity subscale score r (58) = 0.867, p <.001; and the Braden mobility subscale score r (58) = .820, p <.001, with the final Braden Scale score at discharge. Linear regression showed that changes

in the activity subscale, in isolation, can explain 75.2% of changes in the final value of the Braden scale (Z (1.58) = 175.554; p <.001; R2= .752), and that changes in the mobility subscale, in isolation, can explain 68.4% of changes in the final value of the Braden scale (Z (1.58) = 125.506; p <.001; R2= .684).

DISCUSSION

The mean age of the study patients was 78 years old, and the median was 83.5 years old, corroborating other previous studies [1, 3]. It should also be noted that 72% of the patients were 80 years old or older and that advanced age should be considered as a potential risk for PU [6, 7, 11].

As in other studies [1, 3, 4], the participants were mostly women (57%), which may be related to life expectancy at birth in Portugal, which in 2021 was 78.1 years old for men and 83.5 years old for women [22]. In this study, the women were older, but at lower risk of PU and with greater functionality at the time of admission and discharge. These data are in line with data from the EWMA and EPUAP, which indicate that public health expenditure generally increases with a person's age: notably from the age of 55 for men and from the age of 60 for women, naturally coinciding with morbidity in old age [14]. A study carried out in 2017 at the RNCCI of Lisbon and Vale do Tejo also indicates that men have greater multimorbidity than women [4], however other studies indicate the opposite [23, 24].

With regard to the caregiver, it is worth noting that the combination of age characterization with the type of caregiver allows us to infer that a significant proportion of users (33%) are cared for by elderly people, given the degree of kinship in question (spouse/sibling/brother-in-law).

Regarding the main medical diagnosis, it can be seen that there are three large areas distributed evenly: cerebrovascular disease with 28%, diseases of the nervous system (degenerative) with 28% and diseases of the osteoarticular system with 27%. These diagnoses are also the most frequent in the previously cited study carried out by Gonçalves at the RNCCI [4]. It is worth noting that more than half of the users (56%) have neurological conditions, which are known to constitute an important risk factor for PU given the changes in mobility and sensitivity that they generally entail.

When analyzing the data from this study, it can be seen that there are statistically significant differences in the average value of the Braden scale, going from 14.7 (high risk) at the time of admission to 17.7 (low risk) at the time of discharge of the users integrated in the ECCI, in a rehabilitation program. It was also found that 66.6% (n=40) were at high risk of PU at the time of admission, and at the time of discharge this value reduced to 33.3% (n=20). In this study, it was found that the higher the TNF value, that is, the lower the functionality at the time of admission and discharge, the lower the value on the Braden scale, which is in line with existing evidence that states that lower functionality increases the risk of PU (3, 7, 9). The results obtained describe that there is a very strong statistical relationship between the improvement in the value of the Braden **activity** subscale, which alone can explain 75.2% of the changes in the final value of the Braden scale at the time of discharge, and the value of the Braden **mobility** subscale, which alone can explain 68.4% of the changes in the final value of the Braden scale at the time of discharge. These results are in line with the work of Salmerón et al, who reported that the activity and mobility subscales, by themselves, help classification models to discriminate between risk and non-risk of developing PU, providing reliable sensitivity and specificity values.[8]

These two subscales were areas of particular attention for the SNRN [9, 21] and are in line with the EWMA good practice recommendations, with strength of evidence (C), which highlight the importance of "implementing an early mobilization program that increases activity and mobility as quickly as tolerated" and of "teaching and encouraging people who spend long periods sitting to perform pressure relief maneuvers" [6].

CONCLUSION

In the research carried out, we were unable to find evidence on the influence of the SNRN intervention in reducing the risk of PU, which led us to carry out the present study in users who were the target of this intervention and who were discharged from an ECCI in the North of Portugal, between January 1, 2021, and December 31, 2022.

The data revealed that in these users there was a reduction in the risk of PU, expressed through the Braden Scale, with differences with statistical significance in the analysis of the overall value of the Braden Scale between the time of admission (M = 14.72) and the time of discharge (M = 17.70) from the ECCI. It is worth noting that the respective subscales that had the greatest influence on improving the final result were mobility and activity. At the same time, there was also a decrease in the average value of the TNF of the users between admission and discharge, which reveals a decrease in dependence. In view of the results described and taking into account the care provided by the SNRN (such as: performing/teaching/instructing and training articular muscle exercises, balance training, transfer and positioning techniques, walking, walking with a walking aid, climbing/descending stairs, adaptive strategies and prescribing support products), it can be concluded that, in this sample, the nursing interventions implemented within the scope of the SNRN's specific skills resulted in improved functionality (validated by the TNF) and mobility/activity (validated by the Braden scale). It can therefore be

inferred that gains were made in the prevention of PU, reflecting gains in the quality of life of users, family members, carers and for the economy of the NHS. We consider that the results obtained are an important contribution to highlighting the importance of the SNRN's role in promoting mobility, activity and functionality, offering evidence that their interventions are fundamental for reducing the risk of PU, particularly in the context of an ECCI. It is recommended that policies be adopted to encourage the integration of rehabilitation nurses into multidisciplinary continuing care teams, aiming to prevent PU and other complications associated with immobility, with a view to improving health care and user safety.

The limitations of this study include: sample size, the two-year time period, and the limitation of variables, in which data that may interfere with the results, such as comorbidities, the rehabilitation potential of users, nutritional status, and the knowledge and skills of caregivers, were not included. Therefore, the results of the study cannot be extrapolated to other populations or realities.

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Author(s) contribution:
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Data curation: RC
Formal analysis: RC
Investigation: RC;PA;CR;MS;GO
Methodology: RC;PA;CR;MS;GO
Project administration: RC
Supervision: RC
Visualization: RC
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