Original Article

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DISCHARGE PLANNING CARRIED OUT BY NURSES TO INCREASE CAREGIVERS' COMPETENCE: A CLINICAL TRIAL

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ABSTRACT

Objective: to evaluate the effect of discharge planning conducted by nurses for informal caregivers of dependent people in increasing competence to care and reducing hospital readmissions.
Method: a simple, randomized clinical trial conducted with two groups. Ninety-one dyads of informal caregivers–dependent people allocated to the Intervention Group (n=46) and Control Group (n=45) participated. Data collection, carried out in 2021, lasted eight months. The caregivers' outcomes (competence and hospital readmissions) were measured using the COPER-14 instrument at the following moments: pre-/post-intervention; and first, fourth and eighth week after discharge.
Results: the informal caregivers' competence for care was 38% (p<0.001) higher in the Intervention Group. Competence was related to the caregiver's previous experience with care (18% higher, p<0.001) and to the experience of readmissions (11% higher, p<0.001). The Intervention Group had more readmissions (24%), whereas the Control Group showed more readmissions within seven days of discharge (13%).
Conclusion: the intervention was effective in increasing the competence of informal caregivers of dependent people in the dehospitalization process; however, it did not reduce the number of readmissions. Brazilian Clinical Trials Registry: RBR-5rzmzf.

DESCRIPTORS: Patient discharge. Patient care continuity. Education in health. Caregivers. Patient readmission. Nursing assistance plan.

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PLANEJAMENTO DE ALTA REALIZADO POR ENFERMEIROS PARA O AUMENTO DA COMPETÊNCIA DE CUIDADORES: ENSAIO CLÍNICO

RESUMO

Objetivo: avaliar o efeito do planejamento de alta conduzido por enfermeiros a cuidadores informais de pessoas dependentes, no aumento da competência para cuidar e na diminuição das readmissões hospitalares.
Método: ensaio clínico randomizado, simples, conduzido com dois grupos. Participaram 91 díades de cuidadores informais–pessoas dependentes alocadas ao Grupo Intervenção (n=46) e Grupo Controle (n=45). A coleta de dados, realizada em 2021, perdurou por oito meses. Os desfechos dos cuidadores (competência e readmissões hospitalares) foram mensurados pelo instrumento COPER 14, nos momentos: pré/pós-intervenção, primeira, quarta e oitava semana após a alta.
Resultados: a competência para cuidar de cuidadores informais foi 38% (p=<0,001) maior no Grupo Intervenção. A competência relacionou-se à experiência prévia do cuidador com o cuidado (18% maior, p=<0,001) e a vivência de reinternações (11% maior, p=<0,001). O Grupo Intervenção apresentou mais reinternações (24%), enquanto o Grupo Controle demonstrou mais reinternações em até sete dias após a alta (13%).
Conclusão: a intervenção foi efetiva para aumentar a competência de cuidadores informais de pessoas dependentes no processo de desospitalização, contudo não reduziu o número de reinternações. Registro Brasileiro de Ensaios Clínicos RBR-5rzmzf.

DESCRITORES: Alta do paciente. Continuidade da assistência ao paciente. Educação em saúde. Cuidadores. Readmissão do paciente. Plano de assistência de enfermagem.

PLANIFICACIÓN DEL ALTA HOSPITALARIA A CARGO DE ENFERMEROS PARA MEJORAR LA COMPETENCIA DE LOS CUIDADORES: ENSAYO CLÍNICO

RESUMEN

Objetivo: evaluar el efecto de la planificación del alta hospitalaria dirigida por enfermeros para cuidadores informales de personas dependientes sobre el aumento en la competencia de los cuidadores y la reducción en la cantidad de reinternaciones.
Método: ensayo clínico de aleatorización simple y realizado con dos grupos. Los participantes fueron 91 díadas de cuidadores informales–personas dependientes asignadas al Grupo Intervención (n=46) y al Grupo Control (n=45). Realizado en 2021, el procedimiento de recolección de datos duró ocho meses. Los resultados de los cuidadores (competencia y reinternaciones) se midieron con el instrumento COPER 14, en los siguientes momentos: antes/después de la intervención; y a la semana uno, cuatro y ocho después del alta hospitalaria.
Resultados: la competencia para cuidar en los cuidadores informales fue 38% (p<0,001) superior en el Grupo Intervención. La competencia estuvo relacionada con la experiencia previa de los cuidadores en dicha actividad (18% superior, p<0,001) y con haber vivido procesos de reinternación (11% superior, p<0,001). El Grupo Intervención presentó más reinternaciones (24%), mientras que en el Grupo Control se registraron más reinternaciones hasta siete días después del alta hospitalaria (13%).
Conclusión: la intervención fue efectiva para aumentar la competencia de cuidadores informales de personas dependientes durante el proceso del alta hospitalaria, aunque no logró reducir la cantidad de reinternaciones. Registro Brasileño de Ensayos Clínicos RBR-5rzmzf.

DESCRIPTORES: Alta del paciente. Continuidad de la asistencia provista al paciente. Educación en salud. Cuidadores. Reinternación del paciente. Plan de asistencia de Enfermería.

INTRODUCTION

Dehospitalization is characterized as a period of transferring responsibilities for caregiving, mainly in relation to dependent people, who are frequently assisted by a family member at their homes, identified as their informal caregiver[1]. An informal caregiver is the individual, with or without family ties to the dependent person, responsible for helping them with their daily needs. However, informal caregivers do not have professional training or specialization to provide care[1].

In the dehospitalization process, discharge planning is comprised by a set of actions understood as care anticipation, health education consisting of guidelines and training aimed at the sick person and their family members and communication between the services that make up the health care network, ensuring health care continuity[1–3].

Dehospitalizations are complex and related to an increase in hospital readmissions, adverse events, costs and mortality[4]. Returning home implies facing a new reality, requiring caregivers to develop skills related to care that involve more complex technical tasks, which they need to deal with without prior preparation, in addition to the continuous supervision involved in caring for dependent people during the first month after discharge, considered a critical period[1,5–6].

Competence is defined as the individual's capacity, skill and preparedness to perform tasks related to home-based care, coupled with the ability to make decisions to anticipate health-related risk situations[7]. Consequently, competence in home-based care becomes the focal point in care continuity after hospital discharge.

In this aspect, nurses are fundamental because they act in providing caregivers with tools to safely care for dependent people at home[8]. Nurses coordinate discharge planning, are responsible for identifying needs and existing resources, from admission to hospital discharge, coordinating the hospital with the health unit and, thus, enabling home-based care continuity[9–10].

Simply transferring the responsibility for care to families without due professional support is a risky practice, as it subjects dependent people to functional decline, leading to unnecessary readmissions or premature death, which increases costs[2,6]. Discharge planning from hospital to home is also little reported in the Brazilian literature, generating fragmentation in post-discharge care. When it does occur, it typically takes place in an initial or rudimentary manner[3], causing caregivers to not feel supported and lack sufficient information about their family member's health condition and treatment[8–9,11–13].

It is important to welcome the concerns of caregivers and sick people alike and identify possible inhibiting factors in the dehospitalization process that can be characterized as barriers to maintaining self-care and/or care upon returning home[2,11]. From this perspective, this study aims at evaluating the effect of discharge planning carried out by nurses for informal caregivers of dependent people, on increasing competence to provide home-based care and reducing hospital readmissions.

METHOD

This is a randomized, simple random, pre- and post-test clinical trial, not blinded for the main researcher and the participants, but with blinded outcome assessment, conducted with two groups (Control Group and Intervention Group). Usual hospital discharge care was compared to a discharge plan with monitoring by the dependent person's informal caregiver from hospitalization until the eighth week after discharge. A pilot study was carried out and, based on the results found, the eligibility criteria, intervention period and evaluation points of this clinical trial were modified[5].

The population of interest consisted of informal caregivers recruited based on identification of the dependent person hospitalized (patient) at two general public hospitals in a municipality from the Northwest of the state of Paraná. Recruitment took place for six months and the intervention for two months after hospital discharge, totaling eight follow-up months, between February and October 2021.

For eligibility of the hospitalized patients, the following were selected: patients aged 18 years old or over; admission to one of the medical clinic, surgical clinic and/or COVID-19 clinic sectors of the aforementioned hospitals; for a maximum of three days (in order to guarantee adequate time for allocation and interventions); and with global *Barthel* index scores of 10 to 30[14] assessed at the time of the research recruitment.

The inclusion criteria for the caregivers were as follows: they had to be 18 years of age or older, serve as primary informal caregiver, live within the municipalities and districts comprising the metropolitan area of the respective hospitals, possess literacy, have no intentions of relocating during the research period, and scores between 22 and 26 in the Mini-Mental State Examination (MMSE), based on their schooling level[15]. They also needed to have at least one active phone number, own a mobile device running either on *Android* or on *iOS* with *WhatsApp*, and have Internet access. The skills in sending and receiving messages were tested by the researcher before initiating the study.

Exclusion criteria: patient – people in palliative care or who underwent palliative care during hospitalization were excluded (due to the low probability of completing the follow-up period), transfers to another hospital or care institution, other than home-based care, or being in need of specialized health care assistance. Caregiver – not speaking Portuguese, not answering the telephone calls after three attempts on consecutive days. The discontinuation criteria were as follows: dependent person's death prior to completing the educational interventions during hospitalization and phone number change without informing the researcher.

The Daily Bulletin, a document that allows identifying dependent people accompanied by their caregivers, was used to recruit the participants. Such information was made available by the nurse responsible for each sector.

The sampling method used was probabilistic random sampling, which is based on a meta-analysis study of the outcomes in patients who underwent the educational interventions developed by the Nursing team[16]. Based on this, a positivity difference of 40% was established between the exposed and non-exposed groups, with 30% of non-exposed individuals testing positive and 70% of exposed individuals testing positive. A 95% confidence level, 80% statistical power and a proportion of exposed and unexposed people of 1:1 were assumed. The *Fleiss* sampling method with continuity correction was used, totaling 29 participants per group. Furthermore, an additional 20% loss correction rate was assumed, based on the data found in the pilot study[5]. In this way, 35 participants per group were established, totaling 70 participants in the study. The calculation was made using the *OpenEpi* open source program, version 3.0.1.

The process to allocate and randomize the participants took place in a simple random manner. From the list of eligible participants (baseline), the statistician conducted a randomized draw using the *R* software, version 4.0.2, randomly assigning participants either to the Intervention group (n=46 dyads) or to the Control group (n=45 dyads) Each participant was assigned a code in a spreadsheet, with access only limited to the main researcher.

The primary outcome consisted of the performance regarding the informal caregivers' competence to assist dependent people at their homes, assessed using the COPER-14[17] instrument. This instrument has internal validity and reliability (Cronbach's α of 0.82), consists of 14 items (named in this study as COPER 1 – 14) and allows assessing the family caregiver's cognitive, psychomotor, emotional

and relational competences (social interaction) to perform the care task at home. The questionnaire shows satisfactory results to be used in the Brazilian context at all care levels, in order to assist health professionals in assessing informal caregivers' skills, thus contributing to the guidelines and training aimed at the specificities of each informal caregiver and their dependent family member[17]. COPER was administered at the pre-intervention moment (baseline) and in the eighth week for both Control and Intervention group participants. Additionally, it was applied at the post-intervention moment, in the first, fourth and eighth weeks after discharge, exclusively for the participants allocated to the Intervention Group.

The readmission rate was considered as a secondary outcome. If a patient was readmitted unplanned within eight weeks of discharge, the time, place and reason for readmission would be recorded. Hospitalizations after discharge (primary), during the study period and in any tertiary care institution, were considered readmissions. The readmission rate was estimated based on the information available in the literature, with a mean of 14%[18], and compared to data from the Control and Intervention groups after eight follow-up weeks.

The interventions adopted in this study were educational, consisting of verbal health guidelines and training in techniques necessary for home-based care. The research team was comprised by the main researcher (a nurse who is a PhD candidate), a nurse (technical scholarship holder), and with the support of undergraduate Nursing students from second and fourth years, all of whom received prior training.

The Intervention Group participants underwent interventions in the hospital environment (during hospitalization) and at the patients' homes (after hospital discharge). The Control Group participants only received the usual information offered by health institutions (delivery of a summary of hospitalization, medical prescription and referrals for consultations and return visits) at the time of hospital discharge.

The outcomes were evaluated in different ways between the groups, namely: 1) Intervention Group: inter-group assessment at pre-intervention (hospital environment), post-intervention (hospital environment), first week, fourth week and eighth week after hospital discharge (home environment), totaling five assessments; and 2) Control Group: inter-group assessment and assessment at the eighth week after hospital discharge, totaling two assessments. Each group consisted of the informal caregiver-dependent person dyad, with interventions only aimed at the caregivers. The protocol adopted is described below:

Hospital environment

Identification of the participants (pre-intervention) (Intervention Group and Control Group) – The researcher and the assistant nurse identified the eligibility criteria and applied the socioeconomic stratification survey proposed by the Brazilian Association of Research Companies (*Associação Brasileira de Empresas de Pesquisa*, ABEP)[19] and the COPER-14[17] instrument (baseline).

Procedural guidelines and training (post-intervention) (Intervention Group) – The researcher and the assistant nurse detected each caregiver's Nursing problems, the resources available to the family (e.g.: hospital bed or wheelchair, among others), and knowledge about home-based care.

With this information, the main researcher prepared the discharge plan based on each caregiver's needs, consisting of health the necessary guidelines and training on procedures for care. The interventions took place in two meetings: one immediately after the problems were detected and the second scheduled for the following day. The health instructions were verbal, lasted a mean of 120 minutes each and took place in the hospital room.

In the second meeting, what had already been taught was reinforced, the caregivers' doubts that arose after the first meeting were solved and the educational material prepared by the Ministry of Health, entitled *Practical Guide for Caregivers*, was handed in. The manual encompassed all the topics covered in the guidelines and addressed to caregivers according to their needs, namely: warning signs of the disease (malnutrition, dehydration, reduced level of consciousness, bronchoaspiration, as well as pulmonary embolism and deep vein thrombosis for individuals who had COVID-19), feeding, drug administration, pressure injury prevention, post-COVID-19 care, information on social assistance and requests for resources made available by the government (e.g.: Assistance Benefit for People with Disabilities), resource management (family and community), disposal of sharps and points in the Health Care Network (*Rede de Atenção à Saúde*, RAS) for treatment/monitoring continuity.

Concomitantly with the verbal instructions, the main researcher trained the informal caregivers to carry out procedures related to home-based care, such as hand hygiene, position changes and transfers, body and oral hygiene, pain relief techniques, tracheostomy, oxygen concentrator, gastrostomy or nasoenteral tube, ostomy care, orotracheal aspiration and insulin administration. The training followed a checklist with 13 verification items related to home-based patient safety, as provided by the Ministry of Health[20].

In addition to this, all Intervention Group participants were provided with video links from a *YouTubeBR* channel called "Innovation Portal – Innovation in the Management of the Unified Health System" within the "Home-based Care" playlist. This playlist consists of 20 videos covering caregiving techniques for caregiver training, which the participants could access at their convenience via their mobile phones or computers. At the end of this stage, the assistant nurse applied the COPER-14 instrument again (post-intervention).

Home environment

Home visit (1st and 4th weeks) (Intervention Group) – The researcher and the research team *carried out* a home visit (HV) to the caregivers until the seventh day after hospital discharge and a member of the assistant team applied COPER-14. From the first HV, the others were scheduled according to the days and times available and lasted a mean of 60 minutes each. The participants were contacted by phone through calls and/or text messages sent via *WhatsApp*, during the third, fifth and seventh weeks after hospital discharge. A minimum of three contact attempts were made at 72-hour intervals, during the weeks agreed upon.

Home visit (8th week) (Intervention and Control groups) – All caregivers in both groups received an HV eight weeks after hospital discharge, and a member of the assistant team applied the COPER-14[17] instrument on the same occasion. The participants allocated to the Control Group were provided with the *Practical Guide for Caregivers*.

The intervention stage, carried out by the main researcher and the participants, was not conducted blindly. However, the research team (technical nurse and undergraduate assistants) that applied the questionnaires and collected the information at all stages was masked regarding the participants' allocation to the groups. In addition, the team of hospital professionals and the statistical professional conducted the study blindly. In this way, it was sought to minimize possible sources of post-randomization bias, such as co-interventions and evaluations influenced by the outcomes addressed.

The tabulation was carried out by transcribing the data from the instruments into electronic spreadsheets, a process performed solely by the study main researcher. After completing the intervention evaluations, the spreadsheet was anonymized and sent to the statistician responsible for the analysis.

The caregiver characterization variables analyzed included the following: sociodemographic factors – age, gender, marital status, income (considering the minimum wage in Brazil for 2021: R$ 1,100.00), consumer class (ABEP categories A, B1, B2, C1, C2, DE), occupation, schooling level, degree of kinship, health-related characteristics (comorbidities, continued medication use), and caregiving-related aspects: years as a caregiver, caregiving hours per week, prior caregiving experience, presence of other caregivers, and leaving job activities to devote themselves to caregiving.

The caregiver characterization data were described using absolute and relative frequencies. All numerical variables were categorized for the descriptive analysis, allowing for a better identification of the sample. Fisher's Exact and Pearson's Chi-square tests were performed, following the theoretical parameters of each test, to identify differences between the sample groups included in the study.

To evaluate the outcome, analyzed using COPER-14[17], medians and interquartile ranges were described, as the data followed non-normal distribution according to the Shapiro-Wilk test and the histogram analysis. Intra- and inter-group differences were tested, as follows: (1) The intra-group differences were assessed across all five intervention moments, with significance estimation using the Mann-Whitney test. $i = \frac{Vfinal - Vinitial}{Vinitial} X\ 100\%$ was used to calculate the percentage increase. (2) The inter-group differences were evaluated by comparing the pre-intervention moment and eighth post-discharge week for both groups, with significance estimation using the Wilcoxon test.

Subsequently, a regression model was fitted to identify factors associated with the caregiving competence. The regression was carried out using the generalized linear mixed-models method, which takes into account changes over time, allowing for a more reliable modeling based on the presence of interventions at five different moments. Poisson distribution was employed for model fitting because the data consisted of counts on a summative scale.

The variables were tested individually to identify associations with *p-values* < 0.20, and subsequently included in the multivariate model. In this case, the variables with *p-values* < 0.05 remained. For the model fit analysis, the temporality random effects, presence of multicollinearity and residual analysis were emphasized. The Prevalence Rate Ratio (PRR) was estimated with a 95% confidence interval (95% CI) to interpret the results. The data were processed and analyzed in the *R* software, version 4.0.2, using the dplyr, data.table, ggplot2, nlme, lme4 and profileR packages. A 95% confidence level was considered in all analyses.

The study was approved by the Ethics Committee and registered on the Brazilian Clinical Trials Registry (*Registro Brasileiro de Ensaios Clínicos*, ReBEC) platform with code RBR-5rzmzf. All participants signed the Informed Consent Form, in two copies with identical content.

RESULTS

Among the 616 individuals assessed for eligibility, 91 informal caregivers were included in the study: 45 randomized to the Control Group and 46 to the Intervention Group, as shown in Figure 1.

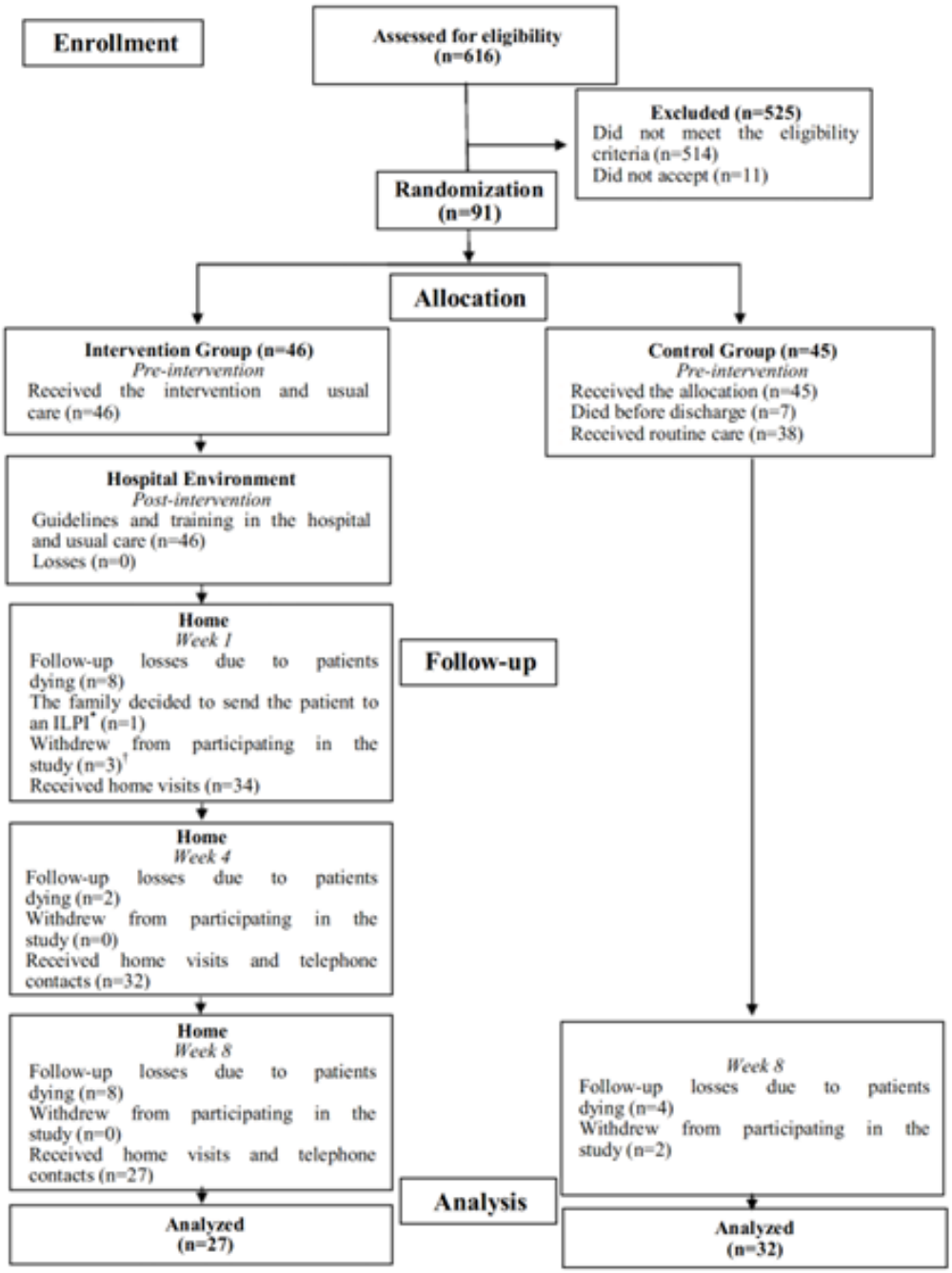

Figure 1 – Flowchart corresponding to the study participants. Maringá, PR, Brazil, 2021.
**Instituição de Longa Permanência para Idosos* (Long-Term Care Facility for Older Adults); †The family caregivers refused to receive the researchers in their homes due to fear of COVID-19 transmission to their relatives.

The variables characterizing the informal caregivers did not show any statistically significant difference between the groups, indicating homogeneity of the sample (Table 1). Among the participants, 82% (n=75) were female, aged between 18 and 79 years old (46±12.6), and with 11% (n=10) over 60. Their time as informal caregivers varied from one day to eight years, with 80% having performed the activity for less than a year. The participants devoted between eight and 24 hours a day to caring for their dependent family member (17±4.2), and only a small percentage had help from other people.

Table 1 – Characterization of the informal caregivers according to socioeconomic, health-related and caregiving process variables. Maringá, PR, Brazil. 2021. (n=91)

Variable	Intervention Group		Control Group		p-value
	N	%	N	%	
Sociodemographic variables					
Gender*					0.1052
Female	41	89.13	34	75.56	
Male	5	10.87	11	24.44	
Age group†					0.2819
≤50 years old	29	63.04	27	60.00	
≥50 years old	17	36.95	18	40.00	
Marital status*					0.7007
Married	30	65.22	30	66.67	
Single	11	23.91	10	22.22	
Divorced	2	4.35	4	8.89	
Widowed	3	6.52	1	2.22	
Schooling†					0.9015
≤8 years	20	43.48	18	40.00	
≥8 years	26	56.52	27	60.00	
Race/Skin color*					0.9149
White	15	32.61	17	37.78	
Brown	14	30.44	11	24.44	
Black	16	34.78	16	35.56	
Asian	1	2.17	1	2.22	
Occupation†					0.8234
Retired	5	10.87	6	13.33	
Unemployed	10	21.74	11	24.44	
Paid activities	26	56.52	21	46.67	
Others	5	10.87	7	15.56	
Income*‡					0.346
≤1 minimum wage	20	43.48	25	55.56	
≥1 minimum wage	26	56.52	20	44.44	
Consumer class*					0.9191
B2	13	28.26	16	35.56	
C1-C2	31	67.39	27	60.00	
D-E	2	4.35	2	4.44	
Health-related characteristics					
Comorbidities†					0.9098
No	22	47.83	20	44.44	
Yes	24	52.17	25	55.56	
Continued use medications†					1
No	23	50.00	23	51.11	
Yes	23	50.00	22	48.89	
Characteristics related to the caregiving process					
Time as a caregiver*					1
≤1 year	37	80.44	36	80.00	
1-2 years	3	6.52	4	8.89	
>2 years	6	13.04	5	11.11	

Table 1 – Cont.

Variable	Intervention Group		Control Group		p-value
	N	%	N	%	
Hours devoted to caregiving†					0.6074
≤12	16	34.78	19	42.22	
≥12	30	65.22	26	57.78	
Left their job to work as caregivers†					0.7278
No	27	58.70	29	64.44	
Yes	19	41.30	16	35.56	

Notes: **p*-value estimated by means of Fisher's Exact Test; †*p*-value estimated by means of Pearson's Chi-Square Test; ‡Minimum wage in Brazil in 2021.

During the period analyzed, the Intervention Group had 11 (24%) readmissions, whereas the Control Group had ten (22%); however, there was no significant difference between the groups (p=0.844). Among the readmissions within seven days after discharge, three (7%) took place in the Intervention Group and six (13%) in the Control Group, indicating nearly twice as many occurrences, although not reaching statistical significance (p=0.074). The hospitalization time for the readmissions varied from one to 37 days (mean of 7 days).

In the intra-group analysis of the Intervention Group, estimated through the Mann-Whitney test, there was a significant difference in the informal caregivers' care competence across all the assessment moments (p<0.001). 58% and 200% percentage increases were observed in the median scores of the informal caregivers' competence between the assessment moments before and after the intervention (median of 19–30, p<0.001), and before the intervention and at the eighth week (median of 19–57, p<0.001), respectively.

When comparing the care competence at the pre-intervention stage, the Control and Intervention groups presented similar levels, classified as from low to good (scores between 14 and 38, median of 18). After eight follow-up weeks, the Intervention Group displayed good to excellent competence (scores between 37 and 70, median of 57), with 78% classified as having excellent competence (>53 points). In the Control Group, eight weeks after hospital discharge, the caregivers' competence varied from poor to good (scores between 23 and 39, median of 31). In this group, 84% were classified as having poor care competence (scores between 18 and 35), as shown in Figure 2.

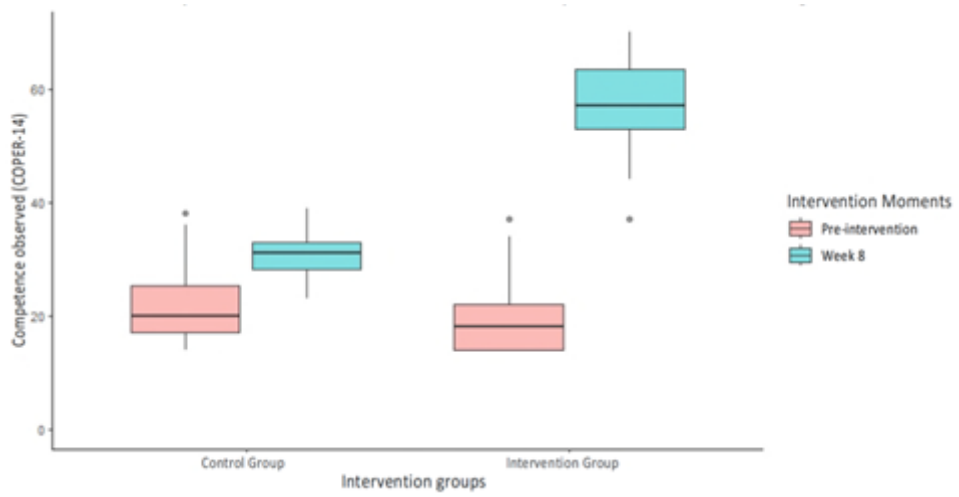

Figure 2 – Inter-group comparison of the informal caregivers' competence as a function of time, at the pre-intervention and in the eighth week. Maringá, PR, Brazil, 2021. (n=91)

Table 2 identifies the differences found between the groups at the pre-intervention moments and in the eighth week, based on each item assessed by the COPER scale and the general score of the instrument.

Table 2 – Inter-group assessment of the competence observed in informal care at the pre-intervention moment and in the eighth week. Maringá, PR, Brazil, 2021. (n=91)

Variables	Pre-Intervention					Week 8				
	Intervention Group		Control Group		*p*-value	Intervention Group		Control Group		*p*-value
	M*	IQR†	M	IQR		M	IQR	M	IQR	
COPER 1‡	1	1	2	1	0.069	4	1	2	0.75	<0.001
COPER 2	1	0	1	0	0.717	4	1	2	0	<0.001
COPER 3	1	0	1	0	0.715	4	1	2	0.75	<0.001
COPER 4	1	0	1	0	0.075	3	1	1	1	<0.001
COPER 5	1	0	1	0	0.087	4	0.5	2	0.75	<0.001
COPER 6	2	1	2	1	0.377	4	1	3	0	<0.001
COPER 7	1	0	1	1	0.600	4	1	2	0	<0.001
COPER 8	1	0	1	1	0.182	4	1	2	0	<0.001
COPER 9	1	0	1	1	0.186	4	0.5	2	0	<0.001
COPER 10	1	0	1	1	0.115	4	0.5	2	1	<0.001
COPER 11	1	0.75	1	1	0.049	4	1	2	1	<0.001
COPER 12	1	1	2	1	0.030	4	1	3	1	<0.001
COPER 13	2	2	2	1	0.100	4	1	3	0	<0.001
COPER 14	1	1	2	1	0.130	4	2	2	1	<0.001
Overall score	18	8	20	8.25	0.056	57	8	31	4.75	<0.001

Note: *M: Median; †IQR: Interquartile Range; ‡COPER: Questions from the COPER instrument[17].

From the multivariate analysis, it is asserted that the informal caregivers' care competence was 38% higher in the Intervention Group when compared to the Control Group. When the caregivers had previous experience with home-based care, competence increased by 18%. Readmissions also exerted a positive impact on increasing the informal caregivers' competence, with an estimated 11% increase, as shown in Table 3.

Table 3 – Multivariate analysis of the mixed-effects generalized linear regression for the informal caregivers' competence model, assessed after eight follow-up weeks. Maringá, Paraná, Brazil, 2021. (n=91)

Variables	PRR*	95% CI†	p-value‡
Intervention Group	1.38	1.28 – 1.49	<0.001
Previous experience with care	1.18	1.05 – 1.32	<0.001
Readmission§	1.11	1.02 – 1.20	<0.001

*PRR: Prevalence Rate Ratio; †CI: Confidence Interval; ‡Significance level estimated using Poisson regression; §Readmission during the research period.

DISCUSSION

Considering the data found in this study, it is asserted that the educational interventions in discharge planning carried out by nurses increased the competence to care in informal caregivers of dependent people, although they did not reduce the number of readmissions. The factors that exerted a positive influence on competence included receiving the educational intervention (discharge planning and home-based follow-up conducted by nurses), prior caregiver experience, and undergoing readmissions.

The data from this study showed that the most significant increases in the care competence occurred after the guidelines and training provided in the hospital environment and at the end of follow-up in the Intervention Group. It is known that the educational strategies aimed at instrumentalizing informal caregivers described in the literature were successful[4,7–8,12,21]. However, the results of this clinical trial, supported by data from the pilot study[5], reinforce that providing health guidelines only in the hospital without proper monitoring at home is not sufficient to sustain the caregivers' competence after discharge.

An initial and ongoing assessment of the dyad is essential for planning and implementing strategies to support clients and their family[22–23] and, thus, promote care continuity. Such moment provides time and support for discharge planning, anticipating conditions that may occur at home, enabling those involved to deal with the functional decline of their family members, in addition to determining the caregiver's psychological readiness to promote active involvement in decision-making and ease the education required for health self-management[12,23]. Secondly, in the home environment, the interventions should be based on experiences and difficulties adapting to the role of caregiver[1].

Another aspect that exerted a positive impact on performance of the competencies and which showed statistical significance consists of the caregivers' previous experience with tasks related to care, contrasting with the results found in the pilot study[5]. In general, the existing studies fail to address the caregivers' previous experience with care and are limited to time as a caregiver and to the hours devoted to caregiving[7,13,23,24,25]. These results suggest that, over time and/or because they have already experienced successes and mistakes in daily care, informal caregivers acquired the necessary skills to manage home-based care.

Regarding the readmissions, similar data were detected in the literature[26]. A research study carried out in the United States of America (USA), which evaluated the implementation of transitional care for hospital discharge, found that the benefits of this service are more significant in reducing readmission rates 60 (x^2=5.40, p=0.02) and 90 days (x^2=4.21, p=0.04) after discharge[2].

In this study, the number of readmissions was higher than previously reported in the literature[2,18,27] and slightly higher in the Intervention Group, whereas there were more readmissions within seven days after discharge in the Control Group. It is suggested that the competencies developed by the informal caregivers from the Intervention Group were effective in early identifying warning signs and/or deterioration in the dependent family member's health status, resulting in greater demand for health services.

The readmissions that occurred in the Control Group are partly associated with the fact that the participants do not have the competencies required to assist the dependent family member during the dehospitalization process, in its most critical period, which consists of the first seven days after discharge, which may have exerted an impact on the greater demand for specialized tertiary-level health services. Similar data were verified in a study conducted in Denmark, whose patients readmitted within 30 days received less information/guidance for discharge (p=0.03)[27].

It is noted that, although readmission is an important indicator for evaluating the dehospitalization process, the instability and complexity of dependent people's health conditions, which is the case of those assisted in this study, can also contribute to returning to the hospital. The increased number of hours devoted to caregiving and the physical strain due to caregiving, as well as the effectiveness of care coordination in the health system, can exert impacts on the patients' return to the hospital[18,25,28–29].

It is recognized that nurses' qualified performance fundamental for the effective implementation of dehospitalization, in addition to contributing to visibility and appreciation of Nursing care[8–10]. However, nurses' training has been shown to be insufficient for the development of competencies to carry out the discharge process, which is aggravated by high turnover and rush to free up beds, negatively compromising the time and quality given to guidelines. It becomes important for nurses to actively engage in the discharge planning process, collaboratively with the multiprofessional team, taking into account the unique needs of each caregiver and dependent individual, as well as fostering improved communication between services and referrals in the health system[12].

The limitations refer to the small sample size and the significant loss of participants, which was associated with the fact that the target population is made up of caregivers of people with high dependence levels, whose clinical condition severity and instability are inevitable. In addition to these individuals' vulnerability to illness and death due to COVID-19, which exerted direct impacts on follow-up losses due to the death of dependent individuals, there was also certain fear that the health professionals/researchers could be a contamination source when entering their homes. This fear was the sole reason cited for discontinuing this research.

There is also the fact that the instructions were only verbal and took place in collective rooms at hospitals. For future research and clinical practice designs, it is suggested to provide caregivers with a written document containing everything that was discussed during their family member's hospitalization and that the guidelines and training take place in a private environment. As this is a specific population segment, the results found in this clinical trial should be interpreted with caution.

CONCLUSION

The intervention proposed was effective in increasing the competence of informal caregivers of dependent people in the dehospitalization process. However, no effects were observed on reducing the number of readmissions. The factors associated with increased competence included receiving educational interventions, which encompassed educational actions to empower caregivers, starting from hospitalization of their family member and continued through subsequent home-based follow-up visits. These interventions involved home visits and telephone contacts that extended for up to eight weeks after hospital discharge. The outcome was related to the fact that the caregivers had previous experience with care and had undergone the period of readmissions. These results reinforce the importance of actions articulated to the RAS, which, in essence, are sensitive to Nursing, for promoting care continuity after hospital discharge, early detecting factors that either ease or hinder the informal caregivers' experiences. These factors should be incorporated into discharge plans to mitigate negative burdens that can deteriorate the health of those involved, thus fostering good quality and patient-centered care.

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NOTES

ORIGIN OF THE ARTICLE

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CONTRIBUTION OF AUTHORITY

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APPROVAL OF ETHICS COMMITTEE IN RESEARCH

The study was approved by the Committee of Ethics and Research with Human Beings of *Universidade Estadual de Maringá*, under opinion No.2,698,239/2018, Certificate of Presentation for Ethical Appraisal No. 89274518.4.0000.0104 and Brazilian Clinical Trials Registry Code U1111-1236-9156.

CONFLICT OF INTEREST

There is no conflict of interest.

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