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Original Article

Modified Hospital Elder Life Program in the emergency department of a public university hospital: a multicomponent intervention program for preventing delirium[1]

Hospital Elder Life Program na unidade de urgência e emergência de um hospital público universitário: um programa de intervenção multicomponente para prevenção de delirium

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Abstract

Objective: To evaluate the feasibility of implementing an adaptation of the Hospital Elder Life Program (HELP) with the participation of family caregivers in a public university hospital. **Method:** Descriptive exploratory pilot study developed with 30 hospitalized patients and their caregivers. Registration Forms were applied to identify risk factors for delirium, to select intervention protocols, and track implementation. Participants' level of satisfaction and barriers to implementing the program were assessed through qualitative interviews. Secondary results were collected from medical records. Descriptive statistical analysis was performed to characterize the sample and content analysis was used to analyze qualitative data. **Results:** Most patients were female (60%), with a mean age of 74.3 years, incomplete elementary school (60%), widowed/divorced (56.7%) and living with family members (83.3%) at home (93.3%). 56.7% had been hospitalized in the last year and 93.3% had at least one risk factor for delirium. Food assistance and fluid replacement was the protocol with the highest adherence (96.2%) and guidance (76.5%) with the lowest. Participants were satisfied and believe that

[1] The study is part of the research project "Implementation of the *Modified Hospital Elder Life Program* in the Hospital das Clínicas of the Federal University of Minas Gerais", which received approval from the Hospital Research Council and the University's Ethics Committee (certificate number: 15527819.2.0000.5149). All ethical procedures were followed and the participants signed the Free and Informed Consent Form.

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HELP contributed to improving patient outcomes. The reasons for not performing the proposed intervention were related to the hospital structure or organization, the patient and the companion. **Conclusion:** Our results suggest that having family members act as "volunteers" is a viable strategy to implement HELP. This strategy can promote its implementation in public hospitals in low and middle-income countries.

Keywords: Healthcare Models, Caregivers, Health Education, Delirium, Elderly.

Resumo

Objetivo: Avaliar a viabilidade da implementação de uma adaptação do Hospital Elder Life Program (HELP) com a participação de cuidadores familiares em hospital público universitário. **Método:** Estudo piloto descritivo exploratório desenvolvido com 30 pacientes internados e seus cuidadores. Os Formulários de Registro foram aplicados para identificar fatores de risco para delirium, selecionar protocolos de intervenção e acompanhar a implementação. Nível de satisfação dos participantes e barreiras para implementar o programa foram avaliados por meio de entrevistas qualitativas. Resultados secundários foram coletados dos prontuários médicos. Análise estatística descritiva foi realizada para caracterizar a amostra e análise de conteúdo foi usada para analisar dados qualitativos. **Resultados:** A maioria dos pacientes era do sexo feminino (60%), com idade média de 74,3 anos, ensino fundamental incompleto (60%), viúvo/divorciado (56,7%) e morava com familiares (83,3%) em casa (93,3%). Haviam sido hospitalizados 56,7% no último ano e 93,3% tinham pelo menos um fator de risco para delirium. Assistência alimentar e reposição de líquidos foi o protocolo com maior adesão (96,2%) e orientação (76,5%) com menor. Os participantes ficaram satisfeitos e acreditam que o HELP contribuiu para melhorar os resultados dos pacientes. Os motivos para não realização da intervenção proposta estavam relacionados à estrutura ou organização hospitalar, ao paciente e ao acompanhante. **Conclusão:** Nossos resultados sugerem que ter membros da família atuando como "voluntários" é uma estratégia viável para implementar o HELP. Essa estratégia pode promover sua implementação em hospitais públicos de países de baixa e média renda.

Palavras-chave: Modelos de Atenção à Saúde, Cuidadores, Educação em saúde, Delírio, Idosos.

Introduction

Delirium is an acute confusional state often seen in hospitalized older adults and is strongly associated with short and long-term adverse outcomes (Marcantonio, 2017; Oh et al., 2017). It is constantly related to increased risk of death, hospital complications and length of stay in all inpatient units such as geriatric units, intensive care units (ICU) and emergency services (Inouye et al., 2014). It is a condition present in up to 30% of seniors in emergency services (Gower et al., 2012) and it costs more than US$164 billion (2011 USD) per year in the United States (Oh et al., 2017). Delirium is associated with a substantial increase in mortality, 37% vs. 14% (with and without delirium, respectively), and may persist for up to 6 months after discharge from

the emergency department (Han et al., 2010). Kennedy et al. (2014) observed an increase in hospital stay by a median of 2 days. Even after discharge, these patients are more likely to have worse cognitive and functional recovery, as well as a higher risk of death (Marcantonio, 2017).

Kennedy et al. (2014) defined advanced age, history of dementia, transient ischemic attack and ischemic stroke, tachypnea, suspected infection, and history of intracranial hemorrhage as predictors of delirium in emergency departments. Poor vision and hearing, multiple comorbidities, depressive symptoms, as well as exposure to risk or precipitating factors such as psychoactive drugs, pain, and sleep deprivation are also involved in the etiology of delirium (Marcantonio, 2017; Inouye et al., 2014). Integrated care targeted at modifiable precipitating factors, with the support of a multidisciplinary team and oriented family, can offer substantial benefits (Inouye et al., 2014; Marcantonio, 2017).

The Hospital Elder Life Program (HELP), developed in 1993, is one of the first multicomponent intervention programs for delirium (Inouye et al., 1999). This program involves interventions that address six previously identified risk factors for the condition and are implemented by volunteers trained by an interdisciplinary team (Inouye et al., 1999). In addition to improving the quality of care for the elderly, HELP is effective in reducing delirium, falls, costs, length of stay, and the occurrence of institutionalization after discharge (Hshieh et al., 2018). A comprehensive evaluation of the HELP model was recently carried out through a systematic review with meta-analysis (Hshieh et al., 2018), which demonstrated a significant reduction in the incidence of delirium (odds ratio [OR] = 0.47, 95% confidence interval [CI]: 0.37-0.59). The incidence of falls in the hospital setting decreased by 42% among patients in the intervention group (OR = 0.38, 95% CI: 0.35-0.95). The cost-effectiveness of care has decreased by about US$1,600 to US$3,800 in hospital costs per patient (Hshieh et al., 2018). Evidence was also found in the reduction of hospitalization time and institutionalization rates after discharge among HELP participants (Hshieh et al., 2018).

HELP has been successfully replicated in several countries and is currently employed in over 200 hospitals worldwide (Hshieh et al., 2018). However, most of the HELP adaptation studies were carried out in high-income countries, with different economic and cultural characteristics from Brazil and other Latin American countries.

Considering the increased risk among hospitalized elderly people, the high cost of care, and the preventable nature of delirium, educating family members can have positive outcomes for patients and caregivers (Carbone & Gugliucci, 2015). A recent randomized clinical trial conducted in China found that performing HELP with family involvement was effective in reducing postoperative delirium in elderly patients after a noncardiac surgical procedure, maintaining or improving their physical and cognitive function and reducing length of stay (Wang et al., 2020). HELP has been adapted to local circumstances in China and has been shown to be effective in the Chinese healthcare system. However, a study investigating the adaptations of HELP in Latin American countries has not yet been carried out.

The objective of the present study was to evaluate the feasibility of implementing an adaptation of the Hospital Elder Life Program (HELP) with the participation of family caregivers in an Urgent and Emergency Unit (UUE) of a public university hospital.

Engaging caregivers as HELP volunteers can be a strategy for implementing the program in low and middle-income countries, such as those in Latin America.

Methods

This exploratory descriptive pilot study was developed at the UUE of a public university hospital with 504 beds in Brazil. Data were collected from June to August 2019. The study received approval from the hospital's research board and the university's ethics committee (certificate number: 15527819.2.0000.5149). All participants signed the Free and Informed Consent Form.

Participants

About 15% of the 56 beds in the hospital's UUE are occupied by elderly people, who spend an average of three to seven days in this department. This length of stay is higher than that reported in the study by Kennedy et al. (2014), which reflects the lack of beds for admission in other public units. As a consequence, there is an overcrowding in the UUE, with the occurrence of numerous disturbances and frequent stress.

As inclusion factors, the following were considered:

- presence of at least one specific risk factor for delirium (memory problem, need for assistance with self-care in the last 24 hours and/or mental confusion during hospitalization or previous illness) identified through self-report or caregiver report;
- presence of a companion (family member or a caregiver) at admission to the UUE with approach by the research team within the first 24 hours. Caregivers should be 18 years of age or older, able to read and write in Portuguese, and to provide written informed consent.

As exclusion factors, we considered elderly people who were discharged early or transferred to other sectors of the hospital within the initial 24 hours of admission, presence of inability to communicate verbally (for example, severe aphasia, profound dementia, coma or mechanical ventilation), being in palliative care, presenting delirium on admission and manifestation of refusal by the patient or caregiver.

Intervention procedures

The intervention strategy for this study is an adaptation of the HELP (HELP, © 1999 Sharon K. Inouye) and the HELP program adapted for family involvement (Rosenbloom-Brunton et al., 2010) to be carried out in the UUE environment. This study adapted the aforementioned HELP protocols for a context of UUE in Brazil and for the implementation of interventions by family caregivers. The HELP protocols implemented by trained family members were: guidance, therapeutic activities, early mobilization, sleep improvement, hearing and vision protocol, food assistance, and fluid replacement (Inouye et al., 1999). Each protocol may have more than one intervention recommended for the patient. The interdisciplinary team (geriatricians, clinical pharmacist, speech therapists, nutritionist, occupational therapist and physical therapist) provided consultancy and support to the program. Residents (one

occupational therapy [OT] and two physical therapy residents [PT]), previously trained in HELP, provided guidance to the caregiver. PT residents performed assessment, planning and training of caregivers for the mobility protocol. For all other protocols, the OT resident provided recommendations for intervention and caregiver training. Booklets on delirium, bed mobility exercises, and sleep enhancement were developed to assist caregivers in the training process. Caregivers received all the necessary material to carry out the recommended interventions. Glasses, sound amplifiers and assistive devices such as walkers and canes were loaned to patients if necessary.

Due to the physical environment of the UUE in that hospital, the recommendations for each protocol were adapted considering the set of activities already performed by patients in the hospital and their physical requirements. For example, as for most patients the toilets are located far from the bed, each trip to the toilet involves walking approximately 50 meters.

Applied instruments

Upon admission to the study, elderly and their caregivers were interviewed using the Participant Registration Form, which was translated and adapted from the HELP Organizational and Procedures Manual (Hospital Elder Life Program, 1999). This form was used to identify risk factors for delirium and select appropriate intervention protocols. The evaluation addressed the following topics: sociodemographic information; past and current medical history; pain using the Visual Analog Pain Scale (Huskisson, 1974; Martinez et al., 2011), ranging from 0 (no pain) to 10 (severe pain - maximum); visual impairment, using the Jaeger test; hearing impairment by the Whisper test (MacPhee et al., 1988; Labanca et al., 2017); nutritional status; sleep condition; level of performance in activities of daily living a month ago and now, using the Katz Index (Katz et al., 1963); mobility level, considering a month earlier and the present moment; cognition, using the Mini-Mental State Examination (Folstein et al., 1975; Brucki et al., 2003); mood and behavior; hobbies and activities of interest; and spirituality.

The Intervention Record Form was used to track the extent to which the caregiver implemented the recommended multicomponent interventions. In this form, recommendations were made daily by members of the research team. Caregivers were encouraged to record the frequency with which the intervention was performed, as well as the reasons for not performing it. An intervention was considered "Accomplished" if the patient performed all recommended interventions with the recommended number of times. "Partially accomplished" if the patient performed some, but not all, protocol interventions or did not perform the intervention the recommended number of times. "Not accomplished" if the patient did not perform any part of the recommended intervention. The performance of the interventions was evaluated daily.

The researchers conducted semi-structured interviews to understand the level of patient and caregiver satisfaction with HELP, reasons for non-adherence, and barriers to implementation. The level of satisfaction was assessed once before discharge and implementation parameters were collected daily. The anonymity of the interviewee was guaranteed to allow freedom of expression in relation to perceptions about HELP. The

satisfaction level assessment and all assessments were performed by research team members who had no role in the intervention and were blind to the nature of the study.

Secondary outcomes (falls and death) were collected from the medical records of the elderly who agreed to participate in the study. The Confusion Assessment Method (CAM) (Inouye et al., 1990), translated into Portuguese and validated for use in Brazil (Fabbri et al., 2001), was used to confirm delirium in suspected cases and to identify cases in high-risk patients (Marcantonio, 2017).

Data analysis

Descriptive statistical analysis was performed to characterize the sample in terms of sociodemographic variables and adherence to the program, in addition to the perceptions of the elderly and family/caregivers in relation to the HELP. Continuous variables were expressed as mean and standard deviation (SD), as well as median and interquartile range. Categorical variables were expressed as absolute frequency and proportion.

Content analysis was used for the data obtained during the interviews. The objective of this type of analysis is to understand the subject's thinking through the expressed content, in order to obtain relevant indicators for the inference of knowledge related to the question studied (Bardin, 1977). In the content analysis, we used the frequency deduction method (for example, repetitions presented in the text) and the analysis of thematic categories (Bardin, 1977). This process consisted of three steps: 1) pre-analysis of the material by the research team to identify emerging themes; 2) exploration of the material that seeks to encode data into categories; and 3) the definition of clear criteria for the inclusion or exclusion of textual elements in each category and the coding of all data. Two researchers independently coded the data. There were no disagreements among researchers regarding coding. The interpretation of the data included the determination of frequencies to identify the relative importance of each category for the participants.

Results

Characteristics of the patient and caregivers

During the data collection period, 321 patients aged 60 years or older were admitted to the UUE. Among these, 148 were potentially eligible for study enrollment. Thirty patients and their caregivers met the eligibility criteria and agreed to participate. Age and sex were similar between patients admitted to the UUE and those included in the study ($p>0.05$). The sociodemographic characteristics, the main health problems at admission and the patient's risk factors are shown in Table 1. Most patients (n=17; 56.7%) were hospitalized in the last twelve months; of these individuals, nine (52.9%) were hospitalized more than once.

Table 1. Sociodemographic characteristics, main health problems at admission and patient risk factors. Belo Horizonte, MG, 2019.

Variables	Patients
Sex	**N (%)**
Feminine	18 (60)
Masculine	12 (40)
Age (years)	**Mean (SD)**
	74,3 (±1.45)
Marital status	**N (%)**
Married or cohabiting	13 (43.3)
Single	0 (0)
Widow/widower	14 (46.7)
Divorced	3 (10)
Educational level	**N (%)**
Illiterate	7 (23.3)
Incomplete elementary school	18 (60)
Complete elementary school	3 (10)
Incomplete high school	0 (0)
Complete high school	2 (6.7)
Living situation	**N (%)**
Lives in own house	28 (93.3)
Lives in someone else's house	2 (6.7)
Housing arrangements	**N (%)**
Lives with relatives (partner, children, grandchildren, in-laws, and/or siblings)	25 (83.3)
Lives alone	5 (16.7)
Occupation (current or past)	**Absolute frequency (%)**
Housewife	17 (56.7)
Housekeeper	9 (30)
Farmer	6 (20)
General services	5 (16.7)
Artisan	4 (13.3)
Driver	3 (10)
Merchant	3 (10)
Seamstress	3 (10)
Mason	2 (6.7)
Woodworker/Locksmith	1 (3.3)
Main health problem at admission	**Absolute**
	frequency (%)
Respiratory system	10 (33.3)
Cardiovascular system	8 (26.7)
Digestive system	6 (20)
Urinary system	5 (16.7)
Others (malaise, fever, pain, unspecified problems)	7 (23.3)
Risk factors for delirium	**Absolute**
	frequency (%)
Need for assistance with self-care in the last 24 hours	28 (93.3)
Memory problems	20 (66.7)
Mental confusion during hospitalization or previous illness	9 (30)

Functionality in activities of daily living was reduced at hospital admission when compared to the performance a month ago, according to data described in Table 2.

Table 2. Absolute frequency of independence/dependence of activities of daily living and mobility status before and after hospitalization. Belo Horizonte, MG, 2019.

Activities	One month ago – at home		On admission – at the hospital	
	Independence	Dependency	Independence	Dependency
Bathing	24	6	16	14
Getting dressed	24	6	18	12
Going to the bathroom	29	1	21	9
Transferring	30	0	25	5
Continence	14	16	14	16
Eating	30	0	26	4
Mobility			**N (%)**	**N (%)**
Wanders without assistive device			27 (90)	21 (70)
Wanders with assistive device			3 (10)	4 (13.3)
Needs assistance from another person to walk			0 (0)	5 (16.7)

In addition to the functional and mobility problems shown in Table 2, most patients had other risk factors related to delirium, such as vision impairment (56.7%), vision and hearing impairment (30%), only hearing impairment (6.7%), cognitive decline (43.3%), lack of appetite (43.3%), and insufficient sleep at home (30%) and/or in the hospital (40%). Some patients (36.7%) reported feeling discouraged, sad or hopeless in the previous month and 23.3% reported loss of interest or pleasure in previously pleasurable activities. The majority (96.7%) reported that religion, faith or spirituality was a source of strength and comfort for them, with 86.7% belonging to a religious group.

Most patients (n=18) were discharged home from the UUE and the other 12 were transferred to another ward of the hospital. The stay at the UUE ranged from 24 hours to 10 days. No patient experienced adverse events, such as delirium, falls or death, during their stay at the UUE. Five patients died during hospitalization and two developed hyperactive delirium after transfer to other wards.

Characteristics of caregivers

Forty caregivers of registered elderly hospitalized patients consented to participate in the study. Therefore, some patients had more than one caregiver applying the interventions. Most caregivers were women, children or daughters-in-law, aged between 18 and 40 years. The caregivers' sociodemographic characteristics are shown in Table 3.

Table 3. Sociodemographic characteristics of caregivers. Belo Horizonte, MG, 2019.

Variables	Patients
Sex	**N (%)**
Feminine	30 (75)
Masculine	10 (25)
Age (years)	**N (%)**
18 – 40	18 (40)
41 - 60	15 (37.5)
61 – 80	7 (17.5)
Educational level	**N (%)**
Incomplete elementary school	13 (32.5)
Complete elementary school	2 (5)
Incomplete high school	1 (2.5)
Complete high school	16 (40)
Incomplete higher education	3 (7.5)
Complete higher education	5 (12.5)
Housing situation	**N (%)**
Lives with the patient	21 (52.5)
Lives somewhere else	19 (47.5)
Relationship with the patient	**N (%)**
Spouse	5 (12.5)
Son/Daughter/In-law	28 (70)
Grandson/granddaughter	4 (10)
Sister	2 (5)
Formal caregiver	1 (2.5)

Feasibility of interventions

Adherence rates were calculated based on 85 intervention registration forms. The protocol “food assistance and fluid replacement” had the highest adherence (96.2%), followed by “early mobilization” (90.5%), “sleep improvement” (81.8%), “hearing and vision” (79.4%), “therapeutic activities” (77.6%) and “orientation” (76.5%). Table 4 presents information on the performance of each protocol and the frequency of recommendations for interventions.

Table 4. General performance of each protocol and frequency of intervention recommendations. Belo Horizonte, MG, 2019.

Protocol	General performance		
	Accomplished (%)	**Partially accomplished (%)**	**Not accomplished (%)**
Assistance with feeding and fluid replacement	96.2	1.3	2.5
	Recommended interventions		**Frequency of recommended interventions (%)**[a]
	Offering small amounts of food frequently		42 (51.2)
	Encouraging food intake		37 (45.1)
	Offering small amounts of liquid frequently		35 (42.7)
	Encouraging fluid intake		23 (28)
	Wearing prosthesis (dentures)		11 (13.4)
	Accomplished (%)	**Partially accomplished (%)**	**Not accomplished (%)**
Early mobilization	90.5	8.3	1.2
	Recommended interventions		**Frequency of recommended interventions (%)**
	Going to the bathroom to take a shower		84 (98.8)
	Going to the bathroom to use the toilet		78 (91.8)
	Taking three walks a day (as recommended)		45 (52.9)
	Sitting on a chair 3 times a day or for meals		26 (30.6)
	Sitting on the bedside 3 times a day or for meals		24 (28.2)
	Encouraging and helping the patient to turn and reposition in bed every 2 hours		24 (28.2)
	Exercising in bed 3 times a day		22 (25.9)
	Placing the bed in chair mode 3 times a day or for meals		21 (24.7)
	Accomplished (%)	**Partially accomplished (%)**	**Not accomplished (%)**
Sleep enhancement	81.8	0.0	18.2
	Recommended interventions		**Frequemcy of recommended interventions (%)**
	Staying alert during the day		8 (80)
	Sleeping earlier		2 (20)
	Using blindfolds or eye caps		1 (10)
	Aromatherapy		1 (10)
	Accomplished (%)	**Partially accomplished (%)**	**Not accomplished (%)**
Vision and hearing	79.4	0.0	20.6
	Recommended interventions		**Frequency of recommended interventions (%)**
	Wearing glasses		35 (100)

Table 4. Continued...

Protocol	General performance		
	Accomplished (%)	**Partially accomplished (%)**	**Not accomplished (%)**
	77.6	14.5	7.9
	Recommended interventions		**Frequency of recommended interventions (%)**
Therapeutic activities	Trivia		58 (72.5)
	Religious activity		38 (47.5)
	Conversation guide		19 (23.8)
	Music		14 (17.5)
	Reading		12 (15)
	Crosswords		11 (13.8)
	Games (e.g. dominoes, checkers, cards)		7 (8.8)
	Painting		7 (8.8)
	Reminiscence		2 (2.5)
	Accomplished (%)	**Partially accomplished (%)**	**Not accomplished (%)**
	76.5	18.5	4.9
	Recommended interventions		**Frequecy of recommended interventions (%)**
Orientation	Using a calendar		69 (85.2)
	Guide to personal information and current affairs		42 (51.9)
	Weather guide relating to meals		21 (25.9)
	Following news (e.g. radio, TV, printed or conversations)		6 (7.4)
	Guide about the place, showing the name of the hospital on the bedding		6 (7.4)

a. The frequency of recommended interventions was presented as the absolute number of intervention recommendations and respective percentages, considering the 85 Intervention Registration Forms.

The HELP satisfaction assessment answered by patients and family members or caregivers indicated that most were satisfied (30.8%) or very satisfied (69.2%) with the program. All participants believed that the HELP contributed during their stay at the UUE. Most interventions were completed and the reasons for non-completion were analyzed in four thematic categories: patient factors, companions' factors, intervention perceived as unnecessary or unimportant, and factors related to the hospital structure or organization.

Patient factors

Patient factors involved refusal, discouragement or lack of interest, clinical status that limits participation (drowsiness, malaise and tiredness) and recommendation

momentarily suspended or restricted by the team due to the worsening of the clinical condition or the need for an examination/procedure.

Companion factors

Factors related to the companion consisted of the caregivers' manifestations of non-offer of activity, a fact that occurred without detailed justification or due to "forgetfulness". Another situation related to not offering the activity was linked to the change of caregivers and the lack of guidelines for the implementation of care. Occasionally, caregivers did not transmit the information and booklets to the other person who took care of the patient after the first caregiver left.

Intervention perceived as unnecessary or unimportant

This category emerged both among patients and among their families or caregivers. Although HELP was seen as a positive program, occasionally some proposed interventions were perceived as unnecessary, as the patient's function was preserved. This was especially true with regard to guiding communication and sleep-promoting interventions. Other times, the intervention was perceived as unimportant by caregivers, who did not encourage the patient to perform a certain activity or to adopt a certain behavior, such as wearing glasses.

Factors related to hospital structure or organization

Two subcategories emerged from factors related to the hospital structure or organization: the unavailability of materials to carry out the interventions and the intensive care activities that occupied free time and limited the implementation of the interventions proposed by the HELP team. The materials perceived as unavailable were: glasses, with a negative effect on the hearing and vision protocol, and blankets, with a negative effect on the sleep improvement protocol. In addition, intensive care activities often impact the performance of therapeutic activities and the early mobilization protocol.

DISCUSSION

Most of the HELP adaptation studies were carried out in developed countries. This is the first study conducted in a Latin American country and one of the few to include patients accompanied by family caregivers in preventive interventions for delirium. Low and middle-income countries have problems in raising funds for program implementation, as well as in recruiting and training volunteers, especially in public hospitals. The present results suggest that caregivers can serve as volunteers and this strategy may be viable for the implementation of HELP in low and middle-income countries.

Brazil is the fifth most populous country in the world, with more than 202 million inhabitants, and is among those with the fastest demographic transitions (United Nations, 2015). The large elderly population imposes new and worrying challenges for Brazil and other low and middle-income countries. For this population group, health

costs tend to be up to three times higher than for the total population (Garcez-Leme & Leme, 2014; Veras & Oliveira, 2016). A prospective, cross-sectional study carried out with 200 hospitalized elderly patients treated at the emergency room of a public teaching hospital in São Paulo reported the occurrence of delirium in 56 of these patients (28%) within the first 24 hours (Ohl et al., 2019). Such circumstances emphasize the importance of implementing HELP in Brazil and other developing countries.

The results of this study revealed very high adherence rates for all interventions, which is consistent with data from other settings where HELP has been implemented (Inouye et al., 2000).

In the present study, food assistance and fluid replacement was the protocol with the highest adherence (96.2%). In addition, we observed that impoverished appetite was one of the most prevalent risk factors at admission (43.3%). Guyonnet & Rolland (2015) showed that poor nutritional status is associated with negative outcomes among the elderly. Many factors are involved in the impairment of nutritional status, such as chronic diseases, loneliness, decline in activities of daily living, poor teething, polypharmacy, inactivity and poverty (Guyonnet & Rolland, 2015). Therefore, the prevention of malnutrition is important to avoid complications and death in the elderly population (Lorenzo et al., 2015).

Reductions in the performance of activities of daily living and mobility were found on admission to the UUE compared to the previous month, at the patient's home. The need for assistance in relation to self-care in the last 24 hours was the most prevalent risk factor for delirium at admission (93.3% of patients). A change of context, such as that which occurs during hospitalization, alters contextual cues to act and can have a negative impact on older adults' engagement (Fritz & Cutchin, 2016). With regard to mobility, the approaches of the patient and the caregiver were important for the realization of this protocol. Early mobilization included many personalized recommendations for functional activities and had a low "unfulfilled" rate (1.2%). Maintaining ambulation, walking approximately 50 meters three times a day, is an important part of preventing delirium. Therefore, future studies should clarify the distances that patients travel while performing daily activities in UUE contexts (Babine et al., 2019).

However, we faced barriers to implementing interventions for hearing and vision protocols, sleep enhancement, and guidance. The lack of familiarity with the proposed intervention, the orientation contrasting with the habits of the patient and the family, and the relatively preserved functionality were considered sufficient for caregivers and/or patients to refuse certain recommended interventions. To deal with this problem, Fritz & Cutchin (2016) recommend considering the nature of habits and having knowledge about the principles of habit modification. Educating caregivers about the importance of delirium prevention interventions and focusing on changing attitudes is critical. Caregivers also attributed the lack of adherence to forgetfulness and the need to help with other aspects of care in the UUE.

Patient refusal was also related to discouragement and lack of interest. It is noteworthy that 36.7% of patients reported feelings of sadness, discouragement or hopelessness and almost a quarter reported loss of interest or pleasure in previously pleasurable activities. A previous study carried out in the southern region of Brazil reported more feelings of loneliness and a higher frequency of depression among

hospitalized elderly people compared to those who were not hospitalized (Gullich et al., 2016). The same study found that participating in religious activities decreased the risk of depression among participants (Gullich et al., 2016). Religiosity serves as an important psychosocial factor for the promotion of mental health, providing hope to the elderly, which can help them overcome illnesses, disabilities and emotional problems (Amorim et al., 2017). In the present sample, religion, faith and/or spirituality were important aspects and a source of comfort. Considering that religion can be a significant source of coping strategies for health problems, especially mental (Vicente et al., 2018), it is possible that religious and spiritual activities are important therapeutic activities related to HELP aimed at patient recovery.

Caregivers were predominantly daughters/children or women who lived with the patient and had more schooling than the patient. Most caregivers completed high school, while most elderly were illiterate or had incomplete elementary school. Indeed, a feature of developing countries is the possibility for the elderly to share their homes with their adult children and other relatives. In addition, women are often the primary caregivers for the elderly. Latin American families are more willing to provide care support to dependent elderly people than families in other high- or upper-middle income countries (Lloyd-Sherlock et al., 2018).

This study has some limitations that must be acknowledged. Our objective was to describe the feasibility of implementing a HELP adaptation in a UUE context. Due to the small sample size, we were unable to analyze the effectiveness of the program compared to other intervention strategies for the prevention of delirium. In addition, as the program was implemented in a single hospital affiliated with an academic institution, our interventions were adapted and implemented by residents. This could constitute a resource barrier in institutions without these students, who would need to find alternatives to adapt and train caregivers. However, the intervention is implemented by caregivers, which helps to reduce staffing costs in order to provide a potentially cost-effective approach despite the need for a reduced team to lead the project. This can be a facilitating factor for the implementation of HELP in public hospitals in low and middle-income countries. Finally, due to service restrictions, it was not possible to perform a systematic implementation of three features of the HELP program (nursing interventions, medication review and systematic interdisciplinary rounds). Future studies should analyze which features of the HELP program are critical to its success and effectiveness.

Conclusion

This is the first study to describe the implementation of the Hospital Elder Life Program (HELP) in Brazil. In this study, having family members act as "volunteers" was a viable strategy for implementing the HELP program. Adherence rates across all interventions were high and similar to those reported in other settings where HELP was implemented. Patients and their caregivers were satisfied with the program and stated that HELP contributed to improving patient outcomes during the hospitalization period.

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References

Amorim, D. N. P., Silveira, C. M. L., Alves, V. P., Faleiros, V. P., & Vilaça, K. H. C. (2017). Associação da religiosidade com a capacidade funcional em idosos: uma revisão sistemática. *Revista Brasileira de Geriatria e Gerontologia*, *20*(5), 722-730.

Babine, R. L., Hyrkäs, K. E., Mckenzie, C. G., & Wierman, H. R. (2019). Mobilizing older adults: a multi-site, exploratory and observational study on patients enrolled in the Hospital Elder Life Program (HELP). *Geriatric Nursing*, *40*(3), 239-245.

Bardin, L. (1977). *Análise de conteúdo.* São Paulo: Martins Fontes.

Brucki, S. M. D., Nitrini, R., Caramelli, P., Bertolucci, P. H. F., & Okamoto, I. H. (2003). Suggestions for utilization of the mini-mental state examination in Brazil. *Arquivos de Neuro-Psiquiatria*, *61*(3B), 777-781.

Carbone, M. K., & Gugliucci, M. R. (2015). Delirium and the family caregiver: the need for evidence-based education interventions. *The Gerontologist*, *55*(3), 345-352.

Fabbri, R. M. A., Moreira, M. A., Garrido, R., & Almeida, O. P. (2001). Validity and reliability of the Portuguese version of the Confusion Assessment Method (CAM) for the detection of delirium in the elderly. *Arquivos de Neuro-Psiquiatria*, *59*(2A), 175-179.

Folstein, M. F., Folstein, S. E., & Mchugh, P. R. (1975). "Mini Mental State": a practical method for grading the cognitive state of patients for the clinician. *Journal of Psychiatric Research*, *12*(3), 189-198.

Fritz, H., & Cutchin, M. P. (2016). Integrating the science of habit: opportunities for occupational therapy. *OTJR*, *36*(2), 92-98.

Garcez-Leme, L. E., & Leme, M. D. (2014). Costs of elderly health care in Brazil: challenges and strategies. *MedicalExpress*, *1*(1), 3-8.

Gower, L. E. J., Gatewood, M. O., & Kang, C. S. (2012). Emergency department management of delirium in the elderly. *Western Journal of Emergency Medicine: Integrating Emergency Care with Population Health*, *13*(2), 194-201.

Gullich, I., Duro, S. M. S., & Cesar, J. A. (2016). Depression among the elderly: a population-based study in Southern Brazil. *Revista Brasileira de Epidemiologia*, *19*(4), 691-701.

Guyonnet, S., & Rolland, Y. (2015). Screening for malnutrition in older people. *Clinics in Geriatric Medicine*, *31*(3), 429-437.

Han, J. H., Shintani, A., Eden, S., Morandi, A., Solberg, L. M., Schnelle, J., Dittus, R. S., Storrow, A. B., & Ely, E. W. (2010). Delirium in the emergency department: an independent predictor of death within 6 months. *Annals of Emergency Medicine*, *56*(3), 244-252.

Hospital Elder Life Program – HELP. (1999). *Organizational and procedural manual: assessment and data collection forms*. Recuperado em 5 de novembro de 2019, de https://www.hospitalelderlifeprogram.org/

Hshieh, T. T., Yang, T., Gartaganis, S. L., Yue, J., & Inouye, S. K. (2018). Hospital Elder Life Program: systematic review and meta-analysis of effectiveness. *The American Journal of Geriatric Psychiatry*, *26*(10), 1015-1033.

Huskisson, E. C. (1974). Measurement of pain. *Lancet*, *304*(7889), 1127-1131.

Inouye, S. K., Bogardus Junior, S. T., Baker, D. I., Leo-Summers, L., & Cooney Junior, L. M. (2000). The Hospital Elder Life Program: a model of care to prevent cognitive and functional decline in older hospitalized patients. *Journal of the American Geriatrics Society*, *48*(12), 1697-1706.

Inouye, S. K., Bogardus, S. T., Charpentier, P. A., Leo-Summers, L., Acampora, D., Holford, T. R., & Cooney, L. M. (1999). A multicomponent intervention to prevent delirium in hospitalized older patients. *The New England Journal of Medicine*, *340*(9), 669-676.

Inouye, S. K., Van Dyck, C. H., Alessi, C. A., Balkin, S., Siegal, A. P., & Horwitz, R. I. (1990). Clarifying confusion: the confusion assessment method: a new method for detection of delirium. *Annals of Internal Medicine*, *113*(12), 941-948.

Inouye, S. K., Westendorp, R. G., & Saczynski, J. S. (2014). Delirium in elderly people. *Lancet*, *383*(9920), 911-922.

Katz, S., Ford, A. B., & Maskowitz, R. W. (1963). Studies of illness in the aged. The index of ADL: a standardized measure of biological and psychosocial function. *Journal of the American Medical Association*, *185*(12), 914-919.

Kennedy, M., Enander, R. A., Tadiri, S. P., Wolfe, R. E., Shapiro, N. I., & Marcantonio, E. R. (2014). Delirium risk prediction, healthcare use and mortality of elderly adults in the emergency department. *JAGS*, *62*(3), 462-469.

Labanca, L., Guimarães, F. S., Costa-Guarisco, L. P., Couto, E. A. B., & Gonçalves, D. U. (2017). Triagem auditiva em idosos: avaliação da acurácia e reprodutibilidade do teste do sussurro. *Ciência & Saúde Coletiva*, *22*(11), 3589-3598.

Lloyd-Sherlock, P., Mayston, R., Acosta, A., Gallardo, S., Guerra, M., Sosa, A. L., de Oca, V. M., & Prince, M. (2018). Allocating family responsibilities for dependent older people in Mexico and Peru. *The Journal of Development Studies*, *54*(4), 682-701.

Lorenzo, M. D., Eleonora, P., Alessandro, P., Anna, M. G., & Valeria, B. (2015). Malnutrition in the elderly. In C. R. Martin & V. R. Preedy (Eds.), *Diet and nutrition in dementia and cognitive decline* (pp. 211-222). London: Elsevier.

MacPhee, G. J. A., Crowther, J. A., & McAlpine, C. H. (1988). A simple screening test for hearing impairment in elderly patients. *Age and Ageing*, *17*(5), 347-351.

Marcantonio, E. R. (2017). Delirium in hospitalized older adults. *The New England Journal of Medicine*, *377*(15), 1456-1466.

Martinez, J. E., Grassi, D. C., & Marques, L. G. (2011). Análise da aplicabilidade de três instrumentos de avaliação de dor em distintas unidades de atendimento: ambulatório, enfermaria e urgência. *Revista Brasileira de Reumatologia*, *51*(4), 304-308.

Oh, S. E., Fong, T. G., Hshieh, T. T., & Inouye, S. K. (2017). Delirium in older persons: advances in diagnosis and treatment. *Journal of the American Medical Association*, *318*(12), 1161-1174.

Ohl, I. C. B., Chavaglia, S. R. R., Ohl, R. I. B., Lopes, M. C. B. T., Campanharo, C. R. V., Okuno, M. F. P., & Batista, R. E. A. (2019). Evaluation of delirium in aged patients assisted at emergency hospital service. *Revista Brasileira de Enfermagem*, *72*(Suppl. 2), 161-168.

Rosenbloom-Brunton, D. A., Henneman, E. A., & Inouye, S. K. (2010). Feasibility of family participation in a delirium prevention program for the older hospitalized adult. *Journal of Gerontological Nursing*, *36*(9), 22-35.

United Nations – UN. (2015). *World Population Prospects: The 2015 Revision*. Recuperado em 8 de novembro de 2019, de https://population.un.org/wpp/

Veras, R. P., & Oliveira, M. R. (2016). Linha de cuidado para o idoso: detalhando o modelo. *Revista Brasileira de Geriatria e Gerontologia*, *19*(6), 887-905.

Vicente, A. R. T., Castro-Costa, E., Firmo, J. O. A., Lima-Costa, M. F., & Loyola Filho, A. I. (2018). Religiousness, social support and the use of antidepressants among the elderly: a population-based study. *Ciência & Saúde Coletiva*, *23*(3), 963-971.

Wang, Y. Y., Yue, J. R., Xie, D. M., Carter, P., Li, Q. L., Gartaganis, S. L., Chen, J., & Inouye, S. K. (2020). Effect of the tailored, family-involved Hospital Elder Life Program on postoperative delirium and function in older adults: a randomized clinical trial. *JAMA Internal Medicine*, *180*(1), 17-25.

Author's Contributions

Luciana de Oliveira Assis: Analyzed and interpreted the data and wrote the manuscript. Ana Carolina da Silva Pinto: Worked on data collection and contributed to the review of the manuscript. Egdar Nunes de Moraes and Marco Túlio Gualberto Cintra: Worked on the final revision of the manuscript. Maria Aparecida Camargos Bicalho: Analyzed and interpreted the data and wrote the manuscript. All authors approved the final version of the text.

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