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Effectiveness of a Telephone Support Line to Reduce Hospital Use by Older Patients with Psychiatric Disorders

Eficácia da Criação de uma Linha Telefónica de Apoio na Redução da Taxa de Admissão Hospitalar em Doentes Idosos com Patologia Psiquiátrica

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ABSTRACT

Background: Hospital-based services, such as emergency departments and in-patient wards, are fundamental resources for provision of acute care but are associated with significant risks and may not fully address the needs of older patients with psychiatric disorders. In order to provide a more flexible approach for continuous management of these complex conditions a telephone support line operated by a nurse was implemented in our psychogeriatric unit.

Aims: To evaluate whether this intervention was associated with a reduction in hospital admissions and emergency department visits.

Methods: Pre-post test study, involving 903 patients who attended the Old Age Psychiatric Unit (OAPU) three years before and three years after the implementation of the intervention (1.09.2008 to 1.10.2014). A patient*time of follow-up index was calculated to weight the periods under OAPU care in both time lapses. Data were also obtained from medical files regarding demographic variables, number and type of hospital admissions and emergency department visits.

Results and Conclusions: In the three-year period prior to the intervention 671.2 patients*years were included (76 ± 7.1 years of age) while after the intervention this reached 2010.1 patients*years (77.8 ± 7 years of age). The intervention was independently found to be associated with a decrease of 43% in psychiatric emergency visits, 54% of non-psychiatric emergency visits, and 61% of non-psychiatric ward admissions.

The implementation of this telephone-based program showed to be associated with a significant reduction of hospital-based acute care utilization. Future research should determine if this was coupled with improved health outcomes.

Key-Words: Older Patients; Psychiatric Disorder; Hospital Admission; Telephone Line; Health Outcomes.

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RESUMO

Introdução: *Os cuidados de saúde hospitalares, como o serviço de urgência ou serviços de internamento, são recursos fundamentais para a provisão de cuidados a doentes agudos mas estão associados a riscos significativos e podem não responder totalmente às necessidades de pessoas mais velhas com patologia psiquiátrica. Para flexibilizar a gestão clínica destas patologias complexas foi implementada uma linha telefónica de apoio com uma enfermeira na nossa unidade de gerontopsiquiatria.*

Objectivos: *Avaliar se esta intervenção se associou a diminuição dos internamentos hospitalares e episódios de urgência.*

Métodos: *Estudo pré-pós envolvendo 903 doentes seguidos na Unidade de Gerontopsiquiatria três anos antes e três anos após a implementação da intervenção (1.09.2008 a 1.10.2014). Foi calculado um índice doente*tempo para determinar os períodos sob seguimento em ambas as fases do estudo. Os dados foram obtidos nos registos clínicos incluindo variáveis demográficas, número e tipo de internamentos hospitalares e episódios de urgência.*

Resultados e Conclusões: *Durante 3 anos antes da intervenção foram incluídos 671.2 doentes*anos (76 ± 7.1 anos de idade) enquanto após a intervenção foram incluídos 2010.1 doentes*anos (77.8 ± 7 anos de idade). A intervenção associou-se a uma redução de 43% nos episódios de urgência psiquiátrica, 54% de episódios de urgência não psiquiátrica e 61% de internamentos não psiquiátricos. A implementação deste programa baseado no atendimento telefónico esteve associado a uma redução de utilização de cuidados hospitalares agudos. Será necessário determinar se esta redução se deveu a uma melhoria clínica.*

Palavras-Chave: *Idoso; Patologia Psiquiátrica; Admissão Hospitalar; Linha Telefónica; Indicadores de Saúde*

INTRODUCTION

Psychiatric disorders, including dementia and depression, are prevalent among older adults[1,2]. These chronic conditions are associated with high levels of disability, vulnerability and increased prevalence of medical comorbidities, demanding a complex and flexible combination of responses by their own families, healthcare services, and social institutions[3]. Nevertheless, the model of care in most hospitals continues to be focused on the management of acute episodes with most resources allocated to the emergency department (ED) and to inpatient wards.

There is strong evidence that this population is particularly prone to suffer adverse outcomes during hospitalization including delirium, loss of independence, institutionalization, and death[4,5]. Importantly, some hospital admissions are potentially preventable by better ambulatory care and early intervention[6]. Caregivers are in a key position to observe the behaviour and the mental status of old people with psychiatric disorders. The use of their information is crucial to recognize early signs of decompensation, to avoid severe disease and to prevent multiple and potentially counteracting interventions.

Thus, a telephone support line operated by a dedicated nurse was created in September 2011 in our OAP Unit. This service was designed to be a bidirectional way to communicate with patients and caregivers (both informal and formal) in order to: a) improve their assessment skills in respect to early signs of decompensation; b) obtain information about the clinical status of patients ensuring timely access to acute care when needed; c) avoid unnecessary visits to the ED and hospitalizations. The aim of this study was to evaluate whether the implementation of this service was associated with a reduction in hospital admissions and ED visits. Results from this research will help to determine whether this approach should be widely implemented across the country.

AIMS

To evaluate whether this intervention was associated with a reduction in hospital admissions and emergency department visits.

METHODS

Study Design and Data Collection

We conducted a retrospective pre-post intervention study in the Old Age Psychiatric Unit (OAPU) of Centro Hospitalar Universitário de Coimbra, Portugal, which has a catchment area of 30,000 people ≥ 65 years. Most referrals are due to cognitive impairment, major depression and psychosis. The study included all patients who contacted the OAPU at least twice during a time period spanning 3 years before (phase 1) and after (phase 2) the implementation of the helpline (1.10.2011). The following data were obtained from medical files of all eligible patients: age (at the beginning of each study period), gender, number and type of hospital admissions and emergency department visits (psychiatric and non-psychiatric). A variable patient*year was created to weight the period each person contributed to each study phase with patients spanning both phases being treated as separate cases. This study constitutes an audit or service evaluation and therefore no approval was needed from the local ethics committee.

Study Phases

During the first phase of the study (1.10.2008 to 30.09.2011) the OAPU was organized as a conventional hospital-based outpatient clinic. Acute symptoms (e.g. agitation) occurring between scheduled appointments were managed in the ED and, in the most severe cases, in the psychiatric ward. During the "after" phase (1.10.2011 to 30.09.2014) the hospital-based outpatient clinic was complemented with a telephone support line. This was available in weekdays and operated by a nurse, from 9 a.m. to 17 p.m., and could be used by patients, family caregivers, formal caregivers and healthcare professionals experiencing some kind of difficulty. This telephone service: a) provided health information, coaching, and emotional support; b) provided assistance to clarify the nature and seriousness of the emerging problems; c) explored the available options including simple counselling tips, referral to our outpatient clinic or to the ED; d) provided information about the management of common problems occurring during the disease course. The nurse regularly contacted each patient and/or caregiver to monitor the health

state. This service received 496 contacts per year during Phase 2. Most common reasons for contact were difficulties in managing the therapeutic regimen, questions related to the caregiver role and acute symptoms (agitation, insomnia and aggression).

Outcomes

Measured outcomes were: a) number of visits to the ED (psychiatric); b) number of visits to the ED (non-psychiatric); c) number of hospitalizations in the psychiatric ward; d) number of non-psychiatric hospitalizations.

Data Analysis

Statistical analysis was performed using PASW Statistics 22.0 software (Chicago, Illinois, USA). T-tests and chi-square tests were used to compare patient characteristics between groups. Poisson and negative binomial regression were used to determine the contribution of each independent variable in study outcomes as these are naturally skewed distributions and rare countable events[7]. The negative binomial regression model was selected as the Poisson regression model did not adequately explain all the variance due to overdispersion[8]. Person-years of follow-up in each study phase was used as the exposure variable, after transformation to its natural logarithm, as required by the statistical program. Age and gender were always imputed as independent covariables in all the analysis performed.

RESULTS

Sample Descriptive and Univariate Analysis

A total of 903 subjects were included in the study with 292 (24.4%) being included in both phases. Women prevailed in both groups and although participants were older and had a longer mean observation time in Phase 2, incidence rates of hospital use decreased. (Table 1)

Table I . Sample characteristics and rates of hospital use.

	Phase 1 (*N1*= 461)	**Phase 2 (*N2*= 734)**	**p-value**
Age (years ± s.d.)	76 ± 7.1	77.8 ± 7	< 0.001
No. Females *(% of sub-sample total)*	284 (*61.6*)	478 (*65.1*)	n.s.
Mean obs. time (years ± s.d.)	1.45 ± 1.0	2.74 ± 0.7	< 0.001
Total follow-up time (∑ person-years)	671.2	2010.1	
Nr. Episodes (*Incident rates*)	***Ne1* (*R1*)**	***Ne2* (*R2*)**	***RR***
Emergency Department visits (ED)			
Psychiatric	95 (*14.2*)	158 (*7.9*)	*1.8*
Non-psychiatric	612 (*91.2*)	953 (*47.4*)	*1.9*
Hospital admissions (HA)			
Psychiatric	21 (*3.1*)	35 (*1.7*)	*1.8*
Non-psychiatric	161 (*24.0*)	235 (*11.7*)	*2.1*

Incident Rates (*R1* & *R2*) = variable * 100 / ∑ patient-year

Risk Ratio (*RR*) = Incident Rate Phase 1 / Incident Rate Phase 2 = ***R1 / R2***

Regression Analysis

The incidence rate ratios (IRR) obtained with negative binomial regressions can be seen in Table 2. A few additional remarks can be made:
- the IRR of ED visits for psychiatric reasons for Phase 2 is 0.573, meaning that phase 2 patients had 57% of such ED visits as compared to Phase 1 patients;
- for non-psychiatric ED visits in addition to Phase 2 there is a significant independent effect of age (an increase of 3.3% in ED visits for each additional year of age);
- male patients had a 2-fold higher rate of admissions to psychiatric wards than females.
- significant effects of the intervention program and age were observed for non-psychiatric hospital admissions.

DISCUSSION AND CONCLUSIONS

The difficulties of healthcare services to meet the needs of older people suffering from psychiatric disorders are increasing due to demographic changes, economic restrictions and the complexity of health issues. Results of this study showed that a telephone helpline created to facilitate communication with patients and caregivers was independently associated with a decreased likelihood for utilization of acute care services, including a drop of 50% in the rate of ED visits. It is likely that this reduction corresponded to a significant number of situations promptly resolved in close collaboration with the caregiver (e.g. dose adjustments and subsequent monitoring) which otherwise would have resulted in a ED visit. Remarkably, this effect was also observed in non-psychiatric acute settings suggesting that management of early signs of psychiatric decompensation are effective in preventing the worsening of underlying medical comorbidities. In fact, the onset or exacerbation of several medical disturbances, such as infections or electrolyte disturbances, often present with acute cognitive impairment or behavioral changes as manifestations of delirium. Since warning signs of delirium can be accurately described by caregivers[9], a helpline may facilitate the rapid use of this information by OAPU team to implement measures that minimize the clinical deterioration of patients. Considering that age was a contributing factor for non-psychiatric hospital use, the adoption of a helpline will help to reduce the burden imposed by increasing number of older psychiatric patients expected for the near future. The relative low rates of psychiatric admissions in either study phases may explain why male gender emerged as the unique factor associated with psychiatric hospitalizations.

The pre-post design has important limitations as the positive results attributed to the intervention can result from other factors (e.g. access barriers). Another limitation is the restricted nature of the available data which doesn't include the psychiatric diagnosis, characterization of medical comorbidities and the reasons for acute-care service utilization. These results should be interpreted with caution as we cannot determine if reduction in healthcare service use corresponded to an improved health status. Yet, observation time in Phase 2 increased in comparison to Phase 1 suggesting a better continuity of care with less drop-outs. Future studies should include a control-group and assess health outcomes and patient satisfaction.

Table II. Negative Binomial Regressions.

Dependent count variables					***95% CI***	
Predictor & confounding factors	***IRR***	***Std.Err.***	***z***	***P > |z|***	***Low***	***Upp***
ED Psychiatric						
Phase 2	**0.573**	0.114	-2.79	0.005	0.388	0.847
Male gender	1.014	0.200	0.07	0.944	0.688	1.493
Age at entry	0.990	0.013	-0.71	0.480	0.963	1.018
Intercept	0.307	0.331	-1.10	0.273	0.037	2.533
Alpha	5.084	0.817			3.710	6.966
Nr. Obs. = 1190 ; Dispersion = Mean						
Log likelihood = -624.751 ; LR chi2(3) = 8.64 ; Prob > chi2 = 0.034						
Likelihood-ratio test of alpha = 0: chibar2(01) = 197.50 ; Prob >= chibar2 = 0.000						
ED Non-Psychiatric						
Phase 2	**0.457**	0.047	-7.59	0.000	0.374	0.560
Male gender	0.953	0.099	-0.46	0.649	0.776	1.171
Age at entry	**1.033**	0.008	4.34	0.000	1.018	1.048
Intercept	0.095	0.055	-4.07	0.000	0.030	0.295
Alpha	1.834	0.138			1.582	2.126
Nr. Obs. = 1190 ; Dispersion = Mean						
Log likelihood = -1876.619 ; LR chi2(3) = 71.37 ; Prob > chi2 = 0.000						
Likelihood-ratio test of alpha = 0: chibar2(01) = 952.29 ; Prob >= chibar2 = 0.000						
Hospital Admissions (psychiatric)						
Phase 2	0.591	0.185	-1.67	0.094	0.320	1.093
Male gender	**2.042**	0.611	2.38	0.017	1.135	3.672
Age at entry	0.976	0.019	-1.28	0.202	0.940	1.013
Intercept	0.146	0.214	-1.31	0.189	0.008	2.584
Alpha	3.980	2.100			1.415	11.194
Nr. Obs. = 1190 ; Dispersion = Mean						
Log likelihood = -221.183 ; LR chi2(3) = 10.50 ; Prob > chi2 = 0.014						
Likelihood-ratio test of alpha = 0: chibar2(01) = 10.26 ; Prob >= chibar2 = 0.001						
Hosp. admissions (non-psychiatric)						
Phase 2	**0.394**	0.062	-5.88	0.000	0.288	0.537
Male gender	1.052	0.168	0.32	0.749	0.769	1.439
Age at entry	**1.043**	0.011	3.85	0.000	1.021	1.066
Intercept	0.011	0.009	-5.17	0.000	0.002	0.061
Alpha	3.022	0.420			2.300	3.969
Nr. Obs. = 1190 ; Dispersion = Mean						
Log likelihood = -915.153 ; LR chi2(3) = 44.49 ; Prob > chi2 = 0.000						
Likelihood-ratio test of alpha = 0: chibar2(01) = 187.81 ; Prob >= chibar2 = 0.000						

The results of this study suggest that a helpline for older patients with psychiatric disorders and/or caregivers is beneficial to reduce avoidable visits to acute-care departments and iatrogenic risks. Being a simple intervention, without the requirement of additional staff and with minimal investment (a telephone line and a dedicated nurse), this methodology can be widely implemented in other units.

Conflicting Interests / *Conflitos de Interesse:*
The authors have declared no competing interests exist.
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