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FROM HOSPITAL TO POST-ACUTE CARE ORGANISATIONS: THE RELATIONSHIP BETWEEN PATIENT EXPERIENCE AND HEALTH RECOVERY

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Abstract

Objective: To determine to what extent patient health status and recovery in post-acute care organizations (PACO) is related to patient experience of the discharge process from hospital and to patient experience while staying in these facilities.

Design: Longitudinal study of patients discharged from hospitals to post-acute care organizations.

Setting: 12 hospitals and 14 PACO Portuguese organizations.

Participants: 181 patients participated in the both stages of data gathering.

Main Outcome Measures: Patients' physical and mental health status was measured through the SF-36 scale. The experience of transition from hospital to post-acute care organizations was measured with the Care Transition Measure. The Picker Adult In-Patient Questionnaire was used to measure patients' experience in these organizations.

Results: Patients reporting better physical condition in post-acute care organizations had a better experience on discharge [b = 0.21, 95% CI (0.10, 0.31)] and perceive fewer problems inside facilities [b = -0.19, 95% CI (-0.31, 0.08)]. The experience in post-acute care organizations is significantly related to patients' mental health status [b = -0.47, 95% CI (-0.59, -0.36)]. Patients showing higher levels of physical recovery had a better experience on discharge [b = -0.18, 95% CI (0.08, 0.28)], while those registering better mental recovery experienced fewer problems during their stay [b = -0.41, 95% CI (-0.52, -0.30)].

Conclusions: PACO play a key role in maintaining and promoting patients' health and this goal is influenced by their experience both in the transition from hospitals to PACO and while staying in these facilities.

Key words: patient outcomes; care pathways; patient-provider communication/information; rehabilitation/long-term care

INTRODUCTION

Efforts to contain costs have led to shorter stays in hospital and higher numbers of patients being discharged to post acute care organisations to promote physical function and independence. Patients discharged from hospital to PACO are mainly older, female, functionally dependent, and often have a diagnosis of dementia [1]. Among older adults, hospitalization itself, especially if prolonged, contributes to functional decline and deterioration of self-care abilities [2], which calls for transition to health maintaining or recovery-oriented units. These organizations are named differently across the world, and in this paper, we use the generic label of post-acute care organizations (PACO) acknowledging that the mix of services provided can vary from short term recovery and rehabilitation to long term care.

The investment in long-term care has risen in most European countries. For instance, as a percentage of gross product, from 2010 to 2017, this investment grew 6.2% in France, 25.6% in Germany, and 41.2% in Portugal [3]. In the USA, hospital discharges to post-acute care increased from 21.0% to 26.3% from 2000 to 2015, while the stay in hospital dropped from 9 days to 7.3 days and the stay in PACO rose from 21.7 to 27.7 days in the same period [4]. Transitions between different health care sites are common events in patients' pathways, and management of discharges and the continuity of care is relevant for patient health and recovery.

In Portugal, PACO are integrated into the National Network for Continued Care and in 2010 provided health care to 24039 patients, a number that had doubled by 2018 [5]. Most of these patients were discharged from hospitals. The network was created in 2006 by the government to provide care to citizens suffering from functional dependency or chronic or incurable diseases in advanced stages, thus promoting patients' autonomy and functionality. The network is a partnership between the Ministries of Health and Labour and Social Solidarity and PACO. To belong to the network, each organization signs a contract with the regional health authority assuring the availability of a specific number of beds. Between 2010 and 2018, the number of beds offered by these organizations grew 85.5%, while the number of beds available in public hospitals decreased 4.1% [5].

Studies examining the effects of discharge from hospitals to home upon patient outcomes abound [6], with early studies reporting several negative outcomes [7, 8] although these results are not consistently supported by subsequent research [9]. Studies about discharge to PACO are less frequent but the tendency to observe negative results, such as medication-related problems [10] or communication mishaps between stakeholders [11] remains.

Both discharge to and staying in PACO implies the expectation of maintaining and promoting patients' health status and quality of life [12]. Patient focused care is likely to be important in realising these benefits, and so a better understanding of the relationship between patient experience and patients' health and recovery is needed to inform efforts to improve quality. This paper addresses the following research questions: 1- to what extent is patient experience of the discharge process from hospitals to PACO related to patient health status and recovery? 2- to what extent is patient experience while staying in PACO related to patient health status and recovery?

METHOD

Study design and setting

We conducted a longitudinal study of patients discharged from 12 hospitals to 14 PACO located in the region of Lisbon belonging to the National Network for Continued Care. We measured patients' experience of the discharge process from hospitals and their health status on discharge and assessed their experience in the PACO and health status 15 to 30 days after discharge. We included hospitalised patients aged over 18. Patients with cognitive impairment, discharged to palliative care or to their homes were excluded.

A multidisciplinary team, including doctors, social workers, nurses, and psychologists is responsible for discharging patients from hospitals to PACO. Teams identify patients eligible for this type of care according to pre-specified criteria, including the principal diagnosis, the assessment of patient independence in daily activities, and the prognosis of recovery. Although all PACO provide the same basic services, i.e., medical and permanent nursing care, four levels of services can be provided by these

entities: short term stay for clinical and functional stabilization (up to 30 days); medium term stay for clinical and functional stabilization (from 30 to 90 days); long term stay aiming to guarantee patient comfort and quality of life (more than 90 days); palliative care services. Discharge teams match patients' needs to PACO characteristics.

Data gathering and sample

Data were collected from May 2014 to November 2015 (phase 1) and from June 2014 to January 2015 (phase 2). After being granted cooperation from the management body of the National Network for Continued Care, 14 hospitals from the Lisbon region were invited to participate in the study, of which 12 agreed. Regarding the PACO, 38 were invited to participate in the study and 14 agreed. In each unit, a doctor was appointed as a main contact facilitating access to patients.

After receiving information from the National Network for Continued Care teams about the predicted discharge date of each eligible patient and the prospective PACO, patients were invited to participate in the study. If there were no obstacles to participation, such as health complications, lack of motivation, or objection from relatives, patients signed the informed consent form. Four trained interviewers assisted patients in answering questionnaires about their health status and experience of discharge on the day of discharge. Two weeks after admission to the respective facility, patients were contacted again. If patient consent was not withdrawn, interviewers assisted patients to complete questionnaires about their health status and experience of the PACO. All data collection occurred in private rooms.

We used G*Power [13] to estimate the minimum number of patients needed, considering the F tests for increased R^2 in a linear multiple regression with a medium effect size ($f^2 = 0.15$). Since in each equation we have up to six predictors, to achieve a power of 0.95 the required sample size was n=107.

In total, during the first phase of the study, 1241 patients were discharged, to PACO. Of these, 512 declined to participate in the study. Of the remaining 729, 97 were not in a physical or mental condition to become involved in the study, their health worsened or they died, 68 declined to

participate, 75 were discharged to palliative care and 278 to PACO that were inaccessible due to constraints, leaving 211 patients included in stage 1. Once in PACO, the health of 21 patients worsened or they died, preventing them from participating in the study, and a further 9 patients refused to participate, or the PACO did not cooperate. The final sample included 181 patients.

Measures

The patient's health status was measured through the Portuguese adaptation of the Short form health survey (SF-36) scale [14], a measure of subjective physical and mental health status. Scores range from 0 to 100 and higher values describe better health. We used this measure on discharge and repeated it during the stay in the PACO two to four weeks after admission, as evidence suggests this measure appropriately captures change over time [15]. In our sample, the reliability of the measure was acceptable (Physical status α=0.84 and 0.86 for transition and stay, respectively; Mental status α=0.88 and 0.87, for transition and stay, respectively). Since patients are discharged to PACO to recover, we computed two recovery indicators, mental and physical, subtracting the health status score on discharge from hospitals from the health status score obtained during the stay.

We measured the experience of transition from hospital to PACO with the Care Transition Measure (CTM-15) [16, 17], a valid and reliable measure of care transfer [18, 19]. Total scores were converted to a 100-point scale and higher values correspond to a better experience. An expert translated to Portuguese and back translated to English the 15 items [20] and two experts reviewed them to guarantee validity regarding Portuguese language. In our sample, CTM-15's reliability was acceptable (α=0.87).

We used the Picker Adult In-Patient Questionnaire (PPE) to measure patients' experience in PACO [21, 22]. After translation, back translation [20], and an expert review of the final items, we changed some words slightly to match the experience in a PACO better, as the original items were focused on hospital care. Reported problems were scored as 1 and added to create a global indicator,

here converted from 0 to 100. Higher scores indicate a poorer experience. In our sample, PPE showed modest but acceptable reliability (KR-20=0.71).

We used patient records to ascertain diagnoses, reason for PACO referral, independence in daily activities, ranging from 0-3, and functioning. Demographic characteristics included age, gender, level of education and marital status.

Analysis

In answering our research questions, we computed four hierarchical regression equations, each with two blocks. The first block comprised control variables and in the second block independent variables were added. The first equation predicted physical health status in the PACO. Physical and health status on discharge, independence score, and the type of PACO (short term or longer) were controls and patient experience on discharge and in the PACO were the independent variables. The second equation mirrors the first, but the dependent variable is the patients' mental health status. In the third and fourth equations we predicted recovery in physical and mental health, respectively, and added to the previously mentioned controls the health status in PACO. The key independent variables were patient experience on discharge and during the stay in PACO. For all statistical tests significance was set at 0.05. Significance of change in the amount of explained variance between blocks one and two was used as evidence of the effect of patient experience variables upon patient health status and recovery. Data analysis was conducted using IBM SPSS version 25 [23].

Results

Sample characteristics

Table 1 describes the final sample. The mean age of included patients is 70.6 years (SD=12.6) and 56.4% are female. Most patients (64.7%) do not live in a stable, long-term relationship. Considering education, the majority of patients have elementary schooling (56.9%). Diseases of the circulatory system (35.9%) and musculoskeletal system and connective tissue (34.3%) were the most frequent main diagnosis.

Hierarchical regression analysis

The regression analysis predicting physical health during the stay in PACO showed a significant effect of patient experience (Table 2). Physical health on discharge was the only significant control variable and the addition of the patient experience measures in block 2 significantly increased the amount of variance explained from 47% (model 1) to 55% (model 2). Table 3 reports the result of the regression analysis predicting mental health during the stay in PACO. This analysis revealed that physical and mental health on discharge were significant but only the experience in PACO was significantly related to mental health during the stay [b = 0.47, 95% CI (-0.59, -0.336)]. The addition of the patient experience variables significantly increases the variance explained from 66% to 76%.

In predicting recovery in physical health during the stay in the PACO (Table 4), independence, physical and mental health on discharge and mental health recovery were significant control variables. Including patient experience in step two revealed that just the experience on discharge significantly predicted recovery in physical health [b = 0.18, 95% CI (0.08, 0.28)]. Patient experience variables significantly increased the variance explained from 25% to 30%. In predicting recovery in mental health, the first step also included recovery in physical health as a control (Table 5). Significant control variables were mental health on discharge and physical health recovery. Results from the second step showed a significant relationship of the patient experience in the PACO with recovery in mental health [b = -0.41, 95% CI (-0.52, -0.30)]. Interestingly, gains in mental health were associated with gains in physical health [b = 0.30, 95% CI (0.16, 0.44)]. Patient experience variables explained significantly more of the variance (56%) than the control variables (43%).

Discussion

In this study we investigated the relationships between patient experience of discharge from hospitals to PACO and during their stay in these care organisations with patients' mental and physical health

status and recovery. Mean results overall improvement in physical and mental health. In fact, physical health mean scores rose from 30.6 to 38.1, and mental health mean scores changed from 47.6 to 58.5, 15 to 30 days after being discharged from hospitals and admitted to PACO.

Overall, after controlling for patients' health condition on discharge, the results reveal that patients experiencing a more positive discharge process show better physical and health status and level of recovery during their stay in PACO. This result is consistent with studies reporting the influence of patient experience on discharge to their homes and health outcomes [19, 24]. However, patient experience on discharge was not related to either mental health status or recovery during the stay in PACO. Nevertheless, patients experiencing a better stay in PACO, in this case reporting fewer problems, reveal higher levels of both mental health status and recovery, a result that echoes studies reporting the relevance of patient experience for improved health [25, 26]. Interestingly, patient improvement in mental health is related to recovering physical health and vice versa, supporting studies that highlight the relevance of clinical expertise in PACO for improving patients' health condition, especially those who adopt a holistic approach [27] and underscore hospital's responsibility in effective transitions and support for subsequent care [28].

The study was not designed to examine causality and the mechanisms linking patient experience and health are not clear. One explanation is that patient experience in this study may be a proxy measure of the quality of care. The PPE measure asks patients about the number of problems experienced in their care, an easily obtained measure of care quality. In our results, poorer patient experience was related to lower health status and recovery and so it is still relevant to optimise patient experience if we want to improve health and recovery. Most studies about the effects of discharge on patients' outcomes show a positive effect of personalised discharge planning on the length of stay in hospital and unscheduled re-admissions to hospital [29]. However, studies are not focused on patients' health and recovery, a key outcome expected from the decision to discharge patients to PACO. Furthermore, studies assessing medical discharge letters highlight several risks associated with this

formal communication tool, which calls for a more patient-centred approach to communicating with patients [30].

Patients reporting better mental health status and greater recovery in this dimension during their stay in PACO tend to be less exposed to negative events. If we assume that the main purpose of PACO is to promote patients' health and recovery, investment in strategies to improve patients' experience in these facilities can lead to positive outcomes. The PPE results provide actionable indicators, such as communication, comfort, and respect, to monitor and improve situations [21], but organizational characteristics, such as a person-centred climate [31] and relational coordination [32, 33], should also be included in improvement efforts.

While not the focus of our study, we found that recovery of mental health is associated with recovery of physical health, reinforcing the relevance of holistic approaches to improve patient functionality and autonomy in PACO. This result is consistent with the case of residential long-term care, where patients' quality of life tends not to be influenced by specifically targeted interventions, which calls for multidimensional interventions [34].

Limitations and further research

Participants were self selected, which limits the generalisability of the findings. Moreover, measuring patients' health condition and recovery using a self-reported measure can lead to bias in evaluation. Further studies could include clinicians' assessment of patients' health condition and evolution, thus expanding the sources of information and improving the accuracy of diagnosis. Different discharge pathways, such as discharge from PACO to home or to hospital again could be included in future studies, which would provide a more comprehensive picture. Our data were collected in 2014-2015 and between 2015 and 2019, the discharge processes from hospitals to PACO did not change, and we do not believe that the pattern of relationships we found suffered significant changes. Finally, our study was conducted in a specific health system, and other healthcare contexts might produce different results.

Implications for practice

The effectiveness of the discharge from hospitals is highly dependent on effective coordination between discharge teams, local coordination teams, specific PACO, and patients and their families. In work contexts characterised by interdependency, uncertainty and time constraints, coordination depends on the existence of effective communication [32], characterized by mutual respect, shared knowledge and shared objectives. The relational coordination framework is a relevant framework providing guidance for better management of this process [33]. In the context of PACO, setting up inter-professional and inter-organizational information systems, developing cross-functional and cross-organizational protocols, and establishing boundary spanners between professions and between organizations seem suitable strategies to improve relational coordination.

In conclusion, in a context of an increasing proportion of discharges from hospitals to PACO providing recuperative care, our study provides evidence of the relationship between the patient experience on discharge and in PACO and their health status and recovery. In line with the increasing centrality of patients in the care pathway [35, 36], these findings call for great emphasis on a patient-centred discharge process and tools and on patient-centred organizational characteristics in PACO.

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TABLES

Table 1. Study sample characteristics

Age, mean (SD)	70.6 (12.6)
Gender (% female)	56.4
Marital status (%)	
Married/stable relationship	35.3
Separated/divorced/single	35.4
Widowed	29.3
Education (%)	
Elementary school	56.9
High school	16.6
University education	12.7
No formal education	13.8
Days in hospital, mean (SD)	55.0 (38.6)
Main diagnosis (%)	
Diseases of the circulatory system	35.9
Diseases of the musculoskeletal system and connective tissue	34,3
Diseases of the nervous system and sense organs	6,1
Diseases of the skin and subcutaneous tissue	5.0
Other	18.7
Type of post-acute care organisation (%)	
Short term (< 30 days)	35.9
Medium term (30-90 days)	45.3
Long term (>90 days)	18.8
Discharge	

Physical health (SF-36), mean (SD)	30.6 (11.5)
Mental health (SF-36), mean (SD)	47.6 (23.3)
Experience (CTM-15), mean (SD)	47.3 (15.3)
Stay in post-acute care organisation	
Physical health (SF-36), mean (SD)	38.1 (14.8)
Mental health (SF-36), mean (SD)	58.6 (20.1)
Experience (PPE), mean (SD)	22.9 (13.0)

N=181 patients; SD, standard deviation. SF-36, Short form health survey. CTM, Care Transition Measure. PPE, Picker Adult In-Patient Questionnaire.

Table 2. Hierarchical regression analysis predicting physical health status during the stay in post-acute care organisations

	Model 1 (R^2=0.47)		Model 2 (R^2=0.55)	
	Beta-coefficient [CI]	*P*-value	Beta-coefficient [CI]	*P*-value
Controls				
Independence score	3.59* [1.31, 5.89]	0.002	2.84* [0.69. 4.99]	0.01
Physical health – discharge (SF-36)	0.79* [0.62, 0.95]	<0.001	0.76* [0.64, 0.92]	<0.001
Mental health – discharge (SF-36)	0.03 [-0.06, 0.11]	0.54	0.02 [-0.06, 0.10]	0.70
Type of PACO (1= short term)	1.85 [-2.33, 6.03]	0.38	1.12 [-2.76, 5.01]	0.57
Patient experience				
Discharge from hospital (CTM)			0.21* [0.10, 0.31]	<0.001
In post-acute care organisation (PPE)			-0.19* [-0.31, -0.08]	<0.001

N = 181 patients. Model 1, controls only. Model 2, interest independent variables added. Beta-coefficients with 95% confidence intervals are reported. SF-36, Short form health survey. CTM, Care Transition Measure. PPE, Picker Adult In-Patient Questionnaire. *Indicates statistical significance.

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Table 3. Hierarchical regression analysis predicting mental health status during the stay in post-acute care organisations

	Model 1 (R^2=0.66)		Model 2 (R^2=0.76)	
	Beta-coefficient [CI]	*P*-value	Beta-coefficient [CI]	*P*-value
Controls				
Independence score	2.48* [-0.01, 4.97]	0.05	2.11* [-0.01, 4.23]	0.05
Physical health – discharge (SF-36)	-0.14 [-0.32, 0.04]	0.14	-0.17* [-0.33, -0.02]	0.03
Mental health – discharge (SF-36)	0.73* [0.64, 0.82]	<0.001	0.76* [0.68, 0.84]	<0.001
Type of PACO (1= short term)	4.67* [0.12, 9.22]	0.04	2.99 [-0.84, 6.83]	0.13
Patient experience				
Discharge from hospital (CTM)			0.09 [-0.01, 0.19]	0.07
In post-acute care organisation (PPE)			-0.47* [-0.59, -0.36]	<0.001

N = 181 patients. Model 1, controls only. Model 2, interest independent variables added. Beta-coefficients with 95% confidence intervals are reported. SF-36, Short form health survey. CTM, Care Transition Measure. PPE, Picker Adult In-Patient Questionnaire. *Indicates statistical significance.

Table 4. Hierarchical regression analysis predicting recovery in physical health during the stay in post-acute care organisations

	Model 1 (R^2=0.25)		Model 2 (R^2=0.30)	
	Beta-coefficient [CI]	*P*-value	Beta-coefficient [CI]	*P*-value
Controls				
Independence score	2.64* [0.53, 4.72]	0.01	2.19* [0.11, 4.23]	0.04
Physical health – discharge (SF-36)	-0.16* [-0.31, -0.01]	0.04	-0.19* [-0.34, -0.04]	0.02
Mental health – discharge (SF-36)	0.13* [0.05, 0.22]	0.002	0.09* [0.01, 0.17]	0.04
Type of PACO (1= short term)	0.04 [-3.81, 3.89]	0.98	0.19 [-3.54, 3.93]	0.92
Gains in mental health	0.39* [0.26-0.51]	<0.001	0.31* [0.17, 0.45]	<0.001
Patient experience				
Discharge from hospital (CTM)			0.18* [0.08, 0.28]	0.001
In post-acute care organisation (PPE)			-0.05 [-0.18, 0.09]	0.49

N = 181 patients. Model 1, controls only. Model 2, interest independent variables added. Beta-coefficients with 95% confidence intervals are reported. SF-36, Short form health survey. CTM, Care Transition Measure. PPE, Picker Adult In-Patient Questionnaire. *Indicates statistical significance.

Table 5. Hierarchical regression analysis predicting recovery in mental health during the stay in post-acute care organisations

	Model 1 (R^2=0.43)		Model 2 (R^2=0.56)	
	Beta-coefficient [CI]	*P*-value	Beta-coefficient [CI]	*P*-value
Controls				
Independence score	0.83 [-1.49, 3.16]	0.48	1.25 [-0.81, 3.32]	0.23
Physical health – discharge (SF-36)	-0.04 [-0.21, 0.13]	0.63	-0.10 [-0.25, 0.05]	0.19
Mental health – discharge (SF-36)	-0.29* [-0.37, -0.20]	<0.001	-0.25* [-0.32, -0.17]	<0.001
Type of PACO (1= short term)	3.82 [-0.33, 7.97]	0.07	2.65 [-1.01, 6.32]	0.16
Gains in physical health	0.46* [0.31, 0.61]	<0.001	0.30* [0.16, 0.44]	<0.001
Patient experience				
Discharge from hospital (CTM)			0.03 [-0.07.0.13]	0.54
In post-acute care organisation (PPE)			-0.41* [-0.53, -0.30]	<0.001

N = 181 patients. Model 1, controls only. Model 2, interest independent variables added. Beta-coefficients with 95% confidence intervals are reported. SF-36, Short form health survey. CTM, Care Transition Measure. PPE, Picker Adult In-Patient Questionnaire. *Indicates statistical significance.