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ORIGINAL ARTICLE

Profile and results of frail patient assessed by advanced practice nursing in an Emergency Department☆,☆☆

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KEYWORDS
Frail elderly;
Resource allocation;
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Abstract
Objectives: To describe the profile of patients evaluated by Nurse Care Management in an Emergency Department and identify the type of alternative healthcare resource assigned and report the results of clinical practice.
Material and methods: Prospective follow-up, on admission to the Emergency Department in an acute hospital and on discharge from the alternative healthcare resource, of patients assessed by Nurse Care Management, from July to December 2015. The patient characteristics, social environment and results of clinical practice were studied.
Results: 190 patients were included of whom 13 were readmitted (6.8%). 122 (59.8%) cases from the Emergency Department were referred to intermediate care facilities, 71 (34.8%) cases for domiciliary care, 10 (4.9%) cases were referred to an acute care hospital and 1 (0.5%) died. Patients referred to intermediate care were more complex, presented geriatric syndromes as their reason for admission and diagnosed with dementia, while those referred to home care

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presented more respiratory and cardiovascular illnesses ($p < 0.05$). The mean Barthel Index and polypharmacy before emergency admission were higher than at the time of discharge from the alternative healthcare resource ($p < 0.05$).
Conclusions: Patients presenting with advanced age, complexity, comorbidity, are referred to intermediate care facilities or domiciliary care, they are admitted to acute care hospitals and are readmitted less than other patients. After being discharged from the alternative resource, they lose functional capacity and present less polypharmacy.

PALABRAS CLAVE
Anciano frágil;
Asignación de recursos;
Emergencias;
Enfermedad crónica;
Enfermería de práctica avanzada

Perfil y resultados del paciente frágil valorado por la enfermera de práctica avanzada en un servicio de urgencias

Resumen
Objetivos: Describir el perfil de pacientes valorados por la Gestora de Continuidad de Cuidados, en un servicio de urgencias e identificar el tipo de recurso asistencial alternativo asignado y los resultados de la práctica clínica.
Material y métodos: Estudio prospectivo de seguimiento al ingreso, en el servicio de urgencias de un hospital de agudos y al alta del recurso asistencial alternativo, de los pacientes valorados por la Gestora de Continuidad de Cuidados, de julio a diciembre de 2015. Se estudiaron las características de los pacientes, entorno social y resultados de la práctica clínica.
Resultados: Se incluyeron 190 pacientes, de los cuales reingresaron 13 (6,8%). Desde urgencias, 122 (59,8%) asistencias se derivaron a centros de atención intermedia, 71(34,8%) a hospitalización domiciliaria, 10 (4,9%) al hospital de agudos y un paciente (0,5%) falleció. Los pacientes derivados a atención intermedia eran más complejos, presentaban síndromes geriátricos como motivo de ingreso y diagnóstico de demencia. Los derivados a hospitalización domiciliaria presentaban más enfermedades respiratorias y cardiovasculares ($p < 0,05$). Los valores medios del índice de Barthel y la polifarmacia, antes del ingreso en urgencias fueron más altos que en el momento del alta del recurso alternativo ($p < 0,05$).
Conclusiones: Los pacientes presentan edad avanzada, complejidad, comorbilidad asociada, se derivan a atención intermedia o a hospitalización domiciliaria, no ingresan en el hospital de agudos y reingresan menos que el resto de los pacientes. Al alta al recurso alternativo, los pacientes pierden capacidad funcional y tienen menos polifarmacia.

What is known?

Emergency services are currently attending to an increasing number of frail patients. As a result of this, there is a need to adapt care to the requirements of the frail patients to improve quality of healthcare and prevent re-admittance and hospitalisation.

What does this paper add?

Results on the continuity of care for the frail patient, in an emergency service, using case management, comprehensive geriatric assessment with involvement from the advanced practice nurse assignment of the ideal healthcare resource.

Introduction

The ageing of the population and changes in lifestyle have led to an increase in chronic diseases. The most prevalent are cancer, cardiovascular and respiratory diseases.[1,2] The high prevalence of patients with chronic diseases, often of advanced age and with several geriatric syndromes, are a growing reality in both health and social systems.[3,4]

Geriatric syndromes, usually rooted in the combination of several diseases, are frequent in frail people.[5–7] Their treatment often requires the prescription of several drugs due to which polymedication and its adverse effects increase. When an elderly person takes 5 or more drugs there is a higher risk of confusion and falls, because their tolerance to the medication is lowered.[8] Polymedication increases the risk of presenting with some type of inappropriate prescription and the probability of suffering from an adverse effect therefore surpasses the therapeutic benefit and is associated with negative health results.[9–11]

For the frail patient (an elderly person presenting with several pathologies, with several geriatric and polymedicated syndromes), fragmentation of care, the intervention of different professionals and the high use of resources leads to a situation of risk.[12] Early identification and detection are key to offering an appropriate response to their care needs. In Catalonia, to make this task easier, complex patients have been divided into two groups: complex chronic patient (CCP) and advanced chronic disease (ACD).[1]

A patient is considered as a CCP when he or she presents with a combination of 4 of the following criteria: a combination of diseases and/or one serious disease, where management involves special elements (episodes that are difficult to control; dynamic and changing evolution; high use of resources; high consumption of drugs; frailness and geriatric syndromes; difficulty in taking decisions; adverse psychosocial situation). A patient is labelled as ACD when he or she presents with advanced chronic diseases and/or conditions which may affect the prognosis of a limited life (<12–18 months) and with a need for palliative care. The tool used for the identification of people in a situation of advanced chronic disease and with need for palliative care in health and social services is the NECPAL programme.[13] Population calculations have estimated the prevalence of CCP as 3.5% and ACD patients as 1.5%.[1] According to these data, it has been estimated that in the Osona district (Barcelona), 7500 people would be in a situation of complexity.

Case management programme proposals led by advanced practice nurses (APN) are in place for addressing the care of frail and complex patients.[14–16] Their main role is to ensure attention to patient needs, promote correct resources, improve care quality and streamline costs.[17–19] In Spain the APN profile is that of a case manager, communication manager, care continuity manager (CCM) and one of advanced skills.[20]

Redesign of chronicity care focuses on evaluation and attention to patient needs, with a view to care continuity, on all levels.[21] The intermediate and home care centres are alternative resources for acute care for frail patients, where in addition to the comprehensive geriatric assessment (CGA) an individualised therapeutic plan is established.[22] The CGA is the most effective benchmark for assessment and caring for elderly and frail people. This is a multidimensional and interdisciplinary assessment which enables problems to be quantified and detected in clinical, functional, cognitive and social spheres.[4,23,24]

Frail patients usually present at the emergency services, arriving in a situation of crisis and often without social support.[25,26] The incorporation of new professional roles, such as the APN, the training of professionals in geriatric knowledge and changes to the structure and organisation mean that emergency services become more agreeable, less aggressive, improve care quality and health results, apart from being more effective in resource managment.[27–29]

In our environment, the emergency service has incorporated a CCM to detect and assess frail patients who may be attended by alternative resources, more suited to their needs. For this reason, our objective was to: describe the patient profile assessed by CCM, in an emergency service and identify the type of alternative care resource assigned and the results of clinical practice.

Material and methods

Design

Descriptive, observational, prospective study of follow-up to hospital admittance, in the emergency service of an acute care hospital, and discharge to an alternative care resource, of patients assessed by the CCM, previously detected and proposed by the emergency team and/or the actual CCM.

Study population and environment

The study was carried out in the emergency service of the *Hospital Universitari de Vic* (HUV), the *Hospital Sant Jaume de Manlleu* and the *Hospital Universitari de la Santa Creu de Vic*. The three centres are situated in the district of Osona (Barcelona).

Sample size was determined by the total number of patients included in the study, consecutively and not randomly, between July and December 2015.

Inclusion and exclusion criteria

The patients put forward for admittance to an alternative care resource and resident in the district of Osona (Barcelona). Patients who lived in other districts were excluded and also those who did not give their consent to participate in the study.

Variables

Sociodemographic variables (age and gender) were studied, along with clinical (patient complexity –CCP/ACD – reason for admittance and morbidity); comprehensive geriatric assessment (clinical, functional cognitive and social situation); type of care resource (acute care hospital, home care, intermediate care) and hospitalisation variables (readmittances $\leq$30 days, admittance to acute care centres, death rate). Table 1 shows all the variable categories.

Tools

The following were used as validated assessment tools: the NECPAL-CCOMS© (used for early identification and in all resources to identify patients with chronic advanced diseases with palliative needs from any cause), the Barthel score (assesses basic daily life activities) and the Pfeiffer test (assesses the cognitive state).

All variables were registered and obtained from the computerised medical record and the GACELA (Spanish acronym for ''advanced management nursing care advice line'') care management information system.

Procedures

Data were obtained at two stages:

1. *Admittance* (T1: start of the study/inclusion of subjects/emergency services): in the emergency services

Table 1 Description of the variables studied and tools used.

		Variables			Tools
Demographics	Age	Date of birth			GACELA
	Gender	Male/female			
Assessment	Patient complexity	CCP	Patient's condition according to professional and/or shared medical record		
	GACELA Column of Tool				
	NECPAL Tool column	ACD			
	Clinical situation	Reason for admittance	Diagnosis of admittance		
			Dementia		
			Respiratory disease		
			Neoplasic disease		
			Cardiovascular disease		
		Background	Infectious disease		
			Other diseases		
		Geriatric syndrome	Incontinence	Needs pads	
			Immobility	Does not walk	
			Undernourishment	Need for protein supplement	
			Constipation	Need for laxatives	
			Dysphagia	Need for thickeners	
			Falls	$\geq$1 in 6 months	
			Serious Polymedication	>9 drugs	
			Ulcers	Need for cures	
			Confusion	Need for medication and/or restraint	
	Functional situation	DLA autonomy			Barthel score
		Mobility			
		Continence			
	Cognitive situation	Normal			Pfeiffer test
		Minor cognitive impairment			
		Moderate cognitive impairment			
		Serious cognitive impairment			
	Social situation	Living together	With the family		GACELA
			Care home		
			Alone		
			Other		
		Social resources	None		
			Care home		
			Home help service		
			Day centre		
			Day hospital		
			Technical aids		
			Other		
Type of care resources	Acute care hospitals				
	Home care				
	Intermediate care				
Care	Readmittance $\leq$30 days				
	Acute care admittance				
	Mortality rate				

DLA: daily life activities; ACD: advanced chronic disease; NECPAL: palliative needs; CCP: chronic complex patient.

department the CCM informed the patients or carers of the study, obtained their informed consent and carried out the patient CGA. Agreement was then made with the patient, family and care team regarding the assigned alternative care resource and/or hospitalisation of the patient into an acute care centre and written information was provided about the care resources assigned, according to the patients needs and availability. All assessments were recorded in the computerised medical record.

2. *Discharge* (T2: end of the study/alternative care resource discharge): before the discharge the nurse who

was responsible for the patient recorded all the study data in the computerised medical record.

Obtention of data was the responsibility of the CCM and the alternative care resources nurses.

Data analysis

Statistical analysis was performed with the IBM SPSS Statistics programme version 21. The frequencies and percentages of the categorical variables were calculated. The mean, standard deviation (SD), medians, minimum and maximum were calculated from the quantitative variables. For bivariate analysis contingency tables were produced. The qualitative variables were compared using the Chi-square or Chi-square with Yates correction (cases expected to be lower than 5) and the quantitative variables were compared using the Student's *t*-test. On comparing the variables between the initial and final phase the Student's *t*-test was used for related samples when quantitative variables were compared and the McNemar test was used for the categorical variables.

A confidence level of 95% ($p < 0.05$) was assumed for all statistical analysis.

Ethical considerations

An information sheet on the study objectives of all patients or carers was provided (in cases where patients showed signs of cognitive impairment) and their written informed consent was given for their study participation. The study was approved by the Ethical Committee of Clinical Research of the ''*Fundació d'Osona per a la Recerca i Educació Sanitària*''.

Results

190 patients participated, of whom 13 (6.8%) had been admitted to hospital on several occasions, 12 (6.3%) twice and 1 (0.5%) three times. In total, the sample patients made 204 trips to the hospital. Fig. 1 shows the flow of referrals. 122 (59.8%) patients from the emergency department were referred to intermediate care facility centres; 71 (34.8%) to home care; 10 (4.9%) were admitted to HUV and 1 (0.5%) died. Of the 10 (100%) patients admitted to HUV, 2 (20%) were discharged home and the other 8 (80%) were referred for intermediate care.

On discharge to intermediate care, 81 (62.2%) were referred for home care, 14 (10.8%) to new social care homes and 24 (18.4%) died. Regarding home care, 62 (87.4%) patients were discharged to their habitual homes and 5 (7.0%) patients died.

Patient profile

Table 2 describes the socio-demographic and clinical characteristics of the patients, according to the care resources assigned to emergency service discharge. Sample homogeneity was observed with respect to age, gender and type of patient complexity. Moreover, the patients referred for intermediate care facilities were characterised by being more complex. They presented with geriatric syndromes as a reason for admittance and were diagnosed with dementia as the most prevalent morbidity than patients referred to other resources ($p < 0.05$). Patients referred to home care presented with more respiratory and cardiovascular diseases than in other resources ($p < 0.05$).

Table 3 shows the results of the CGA, in keeping with the assigned resources. Here we may observe that patients assessed in the emergency departments and referred to intermediate care facilities or admitted to acute care hospitals presented with greater immobility and a history of falls, acute confusion and undernourishment than those referred to home care ($p < 0.05$). It is of note that 62 (50.8%) patients referred to intermediate care facilities could not be assessed using the Pfeiffer test and those referred to home care and hospitalised in acute care hospitals were assessed more on a cognitive level and presented with lower Pfeiffer test scores than those patients referred to intermediate care facilities ($p < 0.05$). It is also observed that over half of patients lived with their family, that those who lived alone used the intermediate care facility resources more and that those who had been in a care home used the home care and the acute hospital care more. Lastly, patients who used intermediate care facilities had more social resources than those who used acute care hospitals or home care ($p < 0.05$).

Health findings

Table 4 shows the Barthel patient scores, prior to emergency service admittance (T1) and when they were discharged (T2) from the intermediate care facility centres or the home care and this emphasizes that all the mean values were higher at the beginning than at the end ($p < 0.05$).

With regards to polymedication analysis, it was observed that 111 (66.1%) patients presented with polymedication when they were attended by the emergency services (T1) and 53 (31.5%) with polymedication on discharge (T2) from the alternative resource ($p < 0.001$). Table 5 shows the results of polymedication and here it stands out that 32 (48.5%) patients referred to intermediate care facilities were polymedicated, but were no longer polymedicated when discharged, and 5 (13.9%) patients who were not polymedicated when admitted to the hospital services, were polymedicated when discharged. With regards to patients who were referred to home care, it was observed that 31 (68.9%) were initially polymedicated, but were not polymedicated when discharged, and that no patients without initial polymedication were polymedicated when discharged.

Discussion

According to this study, over half of patients attended by the emergency services (59.8%) are referred to intermediate care facilities due to their frailty: they are more complex (79.5% have the condition of CCP or ACD), geriatric syndromes are the main reason for admittance to emergency

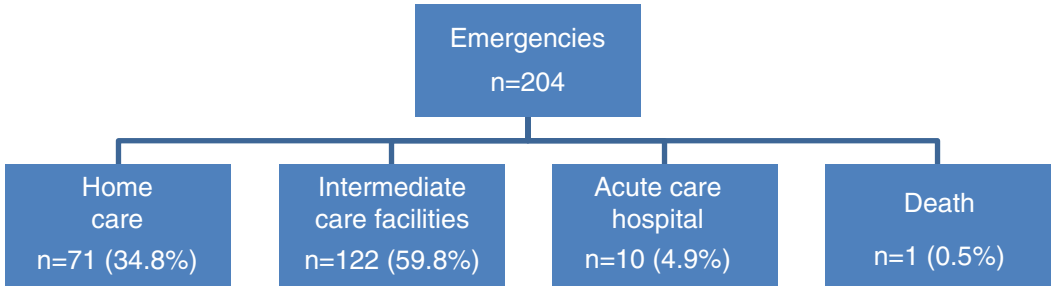

Figure 1 Flow diagram of referrals from emergency care to alternative care resources.

services (27%), with a diagnosis of dementia as the most frequently associated comorbidity (38.5%) and they present with greater mortality (19.7%). These results correspond with numerous studies where it stands out that geriatric syndromes may be considered predictive factors of frailty and that these bear greater risk of having worse health results.[5,30,31] However, patients with cardiovascular and respiratory diseases are the patients most referred to home care. This result are in keeping with the literature which highlights that these diseases are very prevalent in chronic patients and that they benefit from comprehensive care programmes and from pharmacological treatment to solve their health problem.[2,14,26] These findings could be of use as a predictive model of action in the care of frail elderly patients and the suitability of care resources, where the needs and characteristics of patients are more relevant than age and gender.

The majority of patients live with their family and social support is available to them. This is undoubtedly due to the rural traits of the study environment, and for this reason data do not coincide with those of studies conducted in urban environments where the majority of patients with similar characteristics to those studied, are admitted to hospital and do not have any social support.[3,32]

Table 2 Sociodemographic and clinical characteristics of patients, depending on the care resource assigned to emergency discharge.

	Intermediate care facilities 122 (59.8)	Home care n (%) 71 (34.8)	Acute care hospital n (%) 10 (4.9)	*p*
Mean age ± SD	82.0 ± 10.0	81.13 ± 11.1	77.80 ± 11.5	0.45
Gender				
Men	64 (52.5)	37 (52.1)	5 (50.0)	0,99
Women	58 (47.5)	34 (47.9)	5 (50.0)	
Complexity				
No	25 (20.5)	27 (38.0)	4 (40.0)	**0.02**
Yes	97 (79.5)	44 (62.0)	6 (60.0)	
Type of complexity (n = 147)				
CCP	58 (59.8)	32 (72.7)	2 (33.3)	0.11
ACD	39 (40.2)	12 (27.3)	4 (66.7)	
Diagnosis on admittance				
Geriatric syndromes	33 (27.0)	0 (0.0)	1 (10.0)	**<0.001**
Respiratory diseases	18 (14.8)	26 (36.6)	2 (20.0)	
Neoplasic diseases	7 (5.7)	2 (2.8)	1 (10.0)	
Cardiovascular diseases	26 (21.3)	25 (35.2)	3 (30.0)	
Infectious diseases	31 (25.4)	18 (25.4)	2 (20.0)	
Other diseases	7 (5.7)	0 (0.0)	1 (10.0)	
Morbidity				
Dementia	47 (38.5)	13 (18.3)	3 (30.0)	**<0.001**
Respiratory diseases	9 (7.4)	22 (31.0)	2 (20.0)	
Neoplasic diseases	18 (14.8)	6 (8.5)	2 (20.0)	
Cardiovascular diseases	27 (22.1)	25 (35.2)	2 (20.0)	
Infectious diseases	1 (0.8)	0 (0.0)	0 (0.0)	
Other diseases	20 (16.4)	5 (7.0)	1 (10.0)	

ACD: advanced chronic disease; CCP: chronic complex patient.
Significant data in bold.

Table 3 Description of the comprehensive geriatric assessment of patients, according to assigned resources.

	Intermediate care facilities (%) 122 (60.1)	Home care n (%) 71 (34.8)	Acute care hospitals n (%) 10 (4.9)	*p*
Geriatric syndromes				
Incontinence	77 (63.1)	71 (35.0)	7 (70.0)	0.758
Immobility	70 (57.4)	25 (35.2)	5 (50.0)	**0.01**
Undernourishment	30 (24.6)	4 (5.6)	2 (20.0)	**0.004**
Constipation	52 (42.6)	26 (36.6)	10 (4.9)	0.58
Dysphagia	29 (23.8)	13 (18.3)	4 (40.0)	0.28
Fall history	50 (41.0)	15 (21.1)	3 (30.0)	**0.018**
Polymedication	75 (61.5)	46 (64.8)	7 (70.0)	0.81
Pressure ulcer	8 (6.6)	1 (1,.)	1 (10.0)	0.21
Acute confusional syndrome	67 (54.9)	71 (35.0)	6 (60.0)	**<0.001**
Previous Barthel mean ± SD	59.71 ± 27.1	64.86 ± 31.5	6.50 ± 36.8	0.49
Assessable Pfeiffer				
No	62 (50.8)	12 (16.9)	4 (40.0)	**<0.001**
Yes	60 (49.2)	59 (83.1)	6 (60.0)	
Pfeiffer (n = 125)				
Normal	38 (63.3)	44 (74.6)	5 (83.3)	0.66
Mild cognitive impairment	13 (21.7)	8 (13.6)	0 (0.0)	
Moderate cognitive impairment	5 (8.3)	4 (6.8)	1 (16.7)	
Serious cognitive impairment	4 (6.7)	3 (5.1)	0 (0.0)	
Living environment				
Family	73 (59.8)	36 (51.4)	6 (60.0)	**0.04**
Care home	18 (14.8)	24 (34.3)	3 (30.0)	
Alone	19 (15.6)	8 (11.4)	1 (10.0)	
Other	12 (9.8)	2 (2.9)	0 (0.0)	
Social resource				
None	48 (39.3)	32 (45.7)	6 (60.0)	**0.01**
Care home	18 (14.8)	24 (34.3)	3 (30.0)	
HHS	10 (8.2)	3 (4.3)	1 (10.0)	
Day centre	12 (9.8)	0 (0.0)	0 (0.0)	
Day hospital	2 (1.6)	0 (0.0)	0 (0.0)	
Technical aids	5 (4.1)	0 (0.0)	0 (0.0)	
Other	27 (22.1)	11 (15.7)	1 (10)	

HHS: home help service.
Significant data in bold.

Table 4 Barthel scores of patients prior to admittance to emergency services and on discharge from alternative resource.

Barthel score	Intermediate care facilities, n = 97	Home care, n = 61
Admittance to emergency services (T1), mean ± SD	60.21 ± 27.2	64.02 ± 32.0
Discharge from alternative resource (T2), mean ± SD	49.81 ± 28.4	46.39 ± 30.9
Mean difference ± SD	10.39 ± 19.1	17.62 ± 25.0
p	**<0.001**	**<0.001**

Significant data in bold.

The patients referred to intermediate care facilities have more previous social resources and activate others such as social care homes, when they are discharged. This is probably because a large percentage of patients (15.6%) live alone and/or are also very frail and therefore require greater care. However, the patients referred to home care have no previously social resources either before or after discharge. However there is a large number (34.3%) of patients who live in care homes, who benefit from the care and support of the home and who only need specific pharmacological treatment.

Functional impairment, observed when home care patients are discharged, demonstrates the existence of fragility as well as the decompensation from the disease.

Table 5 Description of the polymedication variable according to assigned resource.

	Intermediate care facilities		Home care	
	Polymedication final (T2)			
	No	Yes	No	Yes
Initial polymedication (T1)				
No	31 (86.1%)	5 (13.9%)	21 (100.0%)	0 (0.0%)
Yes	32 (48.5%)	34 (51.5%)	31 (68.9%)	14 (31.1%)
p		**<0.001**		**<0.001**

Significant data are shown in bold.

This situation could point at the need for physiotherapy and/or social support to be made available so as to foster patient autonomy in addition to any clinical treatment and support normally provided.

Good clinical practice is evident from the fact that only 10 patients were admitted to acute care hospitals, together with the low rate of re-admittance (6.8%), compared with that of the 12.2% obtained in one study conducted in the same centre in 2013 and with the same patient profile.[29] These data coincide with another study conducted in the Hospital Valle de Hebrón (Barcelona).[22] We believe that these results would be related to the experience of the care team in detecting the needs of a frail elderly person from the beginning and the characteristics of the area where comprehensive care is a reality and allows patients to be referred to alternative resources from the emergency services.

The baseline polymedication rate is 66.1%, which contrasts with the 48.9% obtained in the study referred to in the previous paragraph.[29] However, it is of note that during admittance, in the intermediate care facility centres and home care, the number of patients who prior to being admitted were polymedicated drops. We believe that these results show that comprehensive geriatric assessment and interdisciplinary practice in these alterative resources facilitate prescription suitability and at the same time reduce polymedication in these patients.

This study highlights the results of clinical practice, of a multidisciplinary team of health professionals, in cronicity attention, which use tools to attend to chronic patients and depending on their traits and needs, establishes how the patients would be cared for, offering them proactive and coordinated care from among the different care resources.[29] As the authors of this paper we wish to underline the clear role of the CCM, who is responsible for assigning the care resource in the emergency service, in keeping with the patient's needs and from the CGA[4,23,24] and case managment.[17,18] This practice is in keeping with many studies which propose the incorporation of advanced practice nurses into care management, improving care quality and streamlining costs.[20,25]

Limitations to be highlighted are that the data obtained could only be extrapolated to other areas when the health levels are coordinated and there is ac comprehensive care setting. We would also emphasise that during the study period patient losses occurred, which were not quantified, at specific moments of increased emergency service activity.

This study contributes new data on the care of frail patients and emphasizes the need to continue researching in this area. We suggest that the figure of the CCM be included into the emergency services to ensure the right resources are offered to frail patients, in accordance with their care needs, and to improve the efficiency of the health system.

We would also recommend that random experimental studies be conducted to provide evidence on APN practices and their cost effectiveness, in addition to qualitative studies covering patient experiences regarding their care process and care continuity from the different care resources.

As a result of this study we can conclude that patients assessed by the CCM, in an emergency service are advanced in age, complex, with associated comorbidities. They are referred to intermediate care facilities or home care, are not admitted to acute care hospitals and are re-admitted less than the other patients. On discharge from the alternative resource, the patients lose functional capacity and are less polymedicated.

Conflict of interests

The authors have no conflict of interests to declare.

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