

How to Assess the Level of Dependency in an Integrated Care Health System

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ABSTRACT

Disability becomes increasingly common with advancing age. Physical Medicine and Rehabilitation (PMR) aims to enhance functional ability and decrease dependency and disabilities. In Andorra, there is a genuine dependence classification called Grau de Dependència Andorra (GDA), which rates 0 (no dependence) to 5 (total dependence). It is used to allocate therapeutic and economic resources at the national public skilled nursing facility (El Cedre). In order to improve patient experience and achieve greater efficiency from health system (Integrated care), this paper aims to reevaluate the actual level of dependence of people staying in El Cedre with several validated scales. Moreover, this study aims to measure patient's dependency against GDA levels and to provide the rehabilitation resources needed for an improved health care.

Method: We conducted a cross-sectional descriptive study in which a PMR physician evaluated all residents using a functional dependence scale (Barthel Index), a cognitive impairment scale (Pfeiffer test), assessment of independent living skills (Lawton Instrumental Activities of Daily Living Scale) and assessment of gait dependence (Rankin Modified Scale Score and Functional Ambulation Classification). Additionally, patients underwent a physical musculoskeletal examination. The residents, their relatives and the staff, including the rehabilitation team, were part of the assessment.

Results: We evaluated 143 patients (120 in patient and 23 in day hospital) of which 48 were men and 95 women. Considering previous GDA classification, almost 70% of patients had at least high dependence. However, there is no data specified on which kind of disability patients were suffering from. Comparing PMR evaluation to GDA results, we found no correlation between GDA level and rehabilitation requirements. As a result we adapted groups to differentiate those subjects with predominantly cognitive impairment from those with mostly physical impairment. We identified more than a half of subjects (52.4%) suffering from cognitive impairment in comparison with the 19.5%, whose main disability came from physical impairment. The vast majority (72.02%) had moderate to high disability. Furthermore, up to 61.55% needed one or more people to walk. Results were reported to Hospital Executive Department, assisting with El Cedre's management.

Conclusion: PMR evaluation in a skilled nursing facility resulted in a change in allocating therapeutic resources, establishing properly the rehabilitation goals. To entirely evaluate disability, it is necessary to use both instruments of cognitive and physical assessment.

Introduction

Disability, or limited ability to carry out basic functional activities, becomes increasingly common with advancing age [1]. It has been a challenge for clinicians to measure disability and its resulting dependence. Therefore, it is mandatory to manage well both human resources and equipment needed to treat disabled people within any healthcare system.

Our country, Andorra, is home to 79,100 people. Its health system has been considered the best in the world concerning the Health care access and Quality Index [2]. According to 2016 Institute for Health Metrics and Evaluation data, life expectancy has risen to 85.8 years in women and 79.3 years in men in recent years. Low back and neck pain followed by sense organ diseases and skin diseases are responsible for the majority of disabilities in Andorra. Although neck and back pain are significantly higher in Andorra than in other countries, sense organ diseases and skin diseases are statistically indistinguishable [3].

In Andorra, there is a genuine dependence classification called Grau de Dependència Andorrà (GDA), which is used to evaluate the dependence by a community assessment commission (Comissió de Valoració Sociosanitària COVASS), comprised of two social workers from Social Issues Department, a nurse, a psychiatrist and a general practitioner. GDA distinguishes six types of dependence levels, from 0 (no dependence) to 5 (total dependence). Between 0 and 5, 1 includes people with low dependence (they need some occasional help to perform basic activities of daily living, ADLs); 2 includes those with mid dependence (they need help in ADLs at least once a day); 3 includes those with high dependence (they need assistance with the majority of ADLs or they need constant supervision due to cognitive condition) and 4 includes those with a very high dependence (they need assistance for almost all

ADLs twice or three times a day but a 24-hour caregiver is not necessary).

Table 1: General characteristics of subjects

	N=143
Gender	
Male (%)	48 (33.5%)
Female (%)	95 (66.4%)
Age	
Mean age (years)	55-97 81.34
Inpatient	120
In day hospital (subjects)	23

Table 2: GDA classification of the study population.

GDA	Characteristics	N
0	independent patients	7
1	low dependence patients	17
2	mid dependence patients	22
3	high dependence patients	30
4	very high dependence patients	17
5	total dependence patients	50
		143

Table 3: GDA definition

GDA	Evaluation Scales results	
0	Pfeiffer 0-4 and Lawton 7-8 and Barthel 90-100	
1	Lawton 0-6	or Pfeiffer 5-10
2	Barthel 60-85	or Barthel 90-100 and Pfeiffer 5-10
3	Barthel 40-55	or Barthel 60-85 and Pfeiffer 5-10
4	Barthel 20-35	or Barthel 40-55 and Pfeiffer 5-10
5	Barthel 0-15	or Barthel 0-35 and Pfeiffer 5-10

Table 4: Simplified GDA classification of the study population

Group		Subjects	%
A	Independence	7	5
B	Low or mid dependence	39	27
C	High or very high dependence	47	33
D	Total dependence	50	35
		143	100

Table 5: Impairment classification and its differentiation

Group	Physical impairment	Cognitive impairment	Both	No relevant impairment
A	1	0	0	6
B	16	15	2	6
C	10	30	7	0
D	1	30	19	0
	28	75	28	12

Formerly in Andorra, dependent people used to be admitted to geriatric centers due to social or health problems. Approximately 10 years ago, there was a reorganization of the National Health System and a skilled nursing facility called El Cedre was opened. The main reason for setting up El Cedre was to treat people of any age with subacute diseases, dependency and social problems who needed transitional care before returning to their homes. In accordance with patient's needs, El Cedre had at its disposal a large amount of human resources and equipment including nursing, medical care, physiotherapy, occupational therapy, speech therapy and neuropsychology. From the beginning, it housed people with chronic diseases and/or subacute illnesses with rehabilitation requirements as well as people with psychosocial problems due to neurodegenerative diseases or dementia. GDA is used as a mean of acceptance to the national public skilled nursing facility (El Cedre) but, more importantly, it is also used to allocate therapeutic and economic resources at the national public skilled nursing facility.

As life expectancy in Andorra has increased, the first patients who resided in El Cedre and never returned home due to dependency, financial or social constraints, have aged and their healthcare needs have changed. In times of economic crisis, it is essential to manage health facilities efficiently. This paper aims to reevaluate the actual level of dependence of people staying in El Cedre with several validated scales and to measure their dependency against GDA levels and to provide the rehabilitation resources needed for an improved health care.

Method: Study Population and Intervention

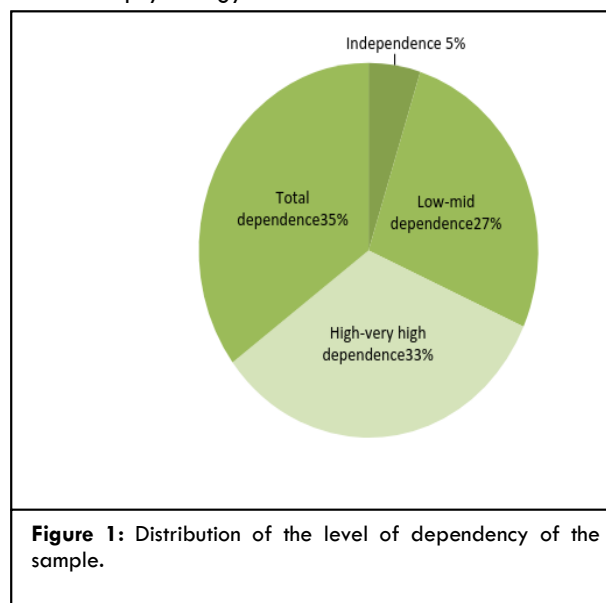
We conducted a cross-sectional descriptive study between July 17th and August 4th 2017. All El Cedre residents were evaluated by a Physical Medicine and Rehabilitation (PMR) physician. For accuracy, at least one nurse or nursing assistant attended the evaluation as well as a patient's relative. Each patient was measured against the following scales: functional dependence scale (Barthel Index), cognitive impairment scale

(Pfeiffer test), assessment of independent living skills (Lawton Instrumental Activities of Daily Living Scale), assessment of gait dependence (Rankin Modified Scale Score and Functional Ambulation Classification).

All the therapies each resident received (occupational therapy, physiotherapy, speech & language therapy and/or neuropsychology) were recorded.

Additionally, patients underwent a physical examination. Consciousness and communicative abilities were firstly evaluated. Patients were asked to do some simple exercises to assess joint mobility and to stand up and walk if possible. Examination was adapted to every individual.

After the evaluations, PMR physician established rehabilitation requirements for each subject. Each patient's goals were set in regard to physiotherapy, speech and language therapy, occupational therapy and neuropsychology.



Results

We evaluated 143 patients (120 inpatient and 23 in day hospital) of which 48 were men and 95 women. Mean age was 81.34 years old within an age range from 55 to 97 years. (Table 1)

To qualitatively measure patients' dependence, we calculated the current GDA (Table 2). GDA comes out of the result of a combination of Pfeiffer test, Lawton Instrumental Activities of Daily Living Scale and Barthel Index (Table 3). It is worth to highlight that almost 70%

of patients had at least high dependence. GDA levels of dependence were gathered in 4 groups, from A to D (Table 4 and Figure 1) to allocate rehabilitation resources.

Specific impairments of the sample are described taking into account each scale. Pfeiffer test results, which recognizes cognitive impairment existence and classifies it in low (3 to 4 mistakes), mid (5 to 7 mistakes) and high (8 to 10 mistakes), identified more than a half (53.8%) suffering from this cognitive deterioration. Just 23% of subjects had no cognitive impairment.

Concerning Rankin Modified Scale Score, which categorizes disability in 7 degrees (from 0, no symptoms, to 6, death), 27.9% of the sample did not suffer from disability or just had few limitations on their day-to-day activities but they could perform ADLs without inconvenience. The vast majority (72.02%) had moderate to high disability so they needed assistance in some instrumental activities and, although they did not need it in ADLs, they required a caregiver at least once a day.

Functional Ambulation Classification categorizes the patients from 0 (no gait capacity) to 5 (independent gait in any surfaces) according to their basic motor abilities to gait performing. 35.6% of subjects had independent gait capability both in flat surfaces and stairs or slopes. In contrast, a 30% of the sample did not walk or they needed assistance or supervision to do so safely. Among all the subjects, up to 61.55% needed assistance to walk.

Comparing PMR evaluation to GDA results, we found no correlation between GDA level and rehabilitation requirements. A high level of dependency in GDA can be due to cognitive impairment, motor impairment or both. Thus, each predominant type of impairment needs a specific rehabilitation program. As a result, we formed four groups, gathering in one group, the patients predominantly affected from cognitive impairment; in another group, the ones with a physical deficiency; in the third one, the subjects with both cognitive and physical impairment and in the last group, those with no disability. We found 28 subjects affected by physical impairment against 75 subjects suffering from cognitive

impairment. 12 subjects had no relevant impairments and 28 of all had both of them equally (Table 5). We made a report showing our study results to Hospital Executive Department aiming to assist with El Cedre management with their rehabilitation requirements.

Discussion

Disability, or limited ability to carry out basic functional activities, becomes increasingly common with advancing age. Crude rates of disability are rising around the globe with over 700 million years lived with disability (YLD) in 2010 compared with 583 million in 1990. However, after adjusting for population growth rates of YLDs per 100.000, disabled people have remained largely constant over time, but the number rises steadily with age [1]. Due to its dynamical characteristics, assessing disability means to examine the level of dependency and to reevaluate it periodically. In terms of integrated care, the patient's perspective remains a central organizing principle throughout. Integrated care is an organizing principle for care delivery with the aim of achieving improved patient care through better coordination of services provided [4].

It is widely known that disability holds a great consumption of resources. The Convention on rights of persons with disabilities (CRPD) [6] was the first United Nation treaty to protect the fundamental rights of people with disabilities, and encourages all member states to adopt appropriate measures to eliminate discrimination and poverty, improve health, quality education and employment of people with disabilities. The World Report on Disability [7] identifies PMR as a fundamental process to support physical independence, mental, social and vocational ability and encourages Member States to identify and address the barriers faced by people with disabilities [8]. Thus, the primary purpose of rehabilitation is to enable people to function at the highest possible level despite physical or cognitive impairment. PMR physicians are the medical specialists who are able to better evaluate dependency and disability.

In Andorra, the first national public skilled nursing facilities (El Cedre) was opened around 10 years ago.

El Cedre population has not changed substantially in this period of time apart from ageing. In this context, as PMR physicians, we met a need of reevaluating the level of dependency of El Cedre's patients to adjust allocated rehabilitation resources that were decided following GDA classification so far. We found that GDA can be a good instrument to evaluate dependency but not appropriate to assign rehabilitation goals and resources. The lack of correlation between GDA and rehabilitation lies into its inability to differentiate cognitive and physical impairment. As previously mentioned, the level of dependency results from cognitive impairment, motor impairment or both. Each type of impairment needs specific rehabilitation program and their goals have to be set by a PMR physician.

Strengths and Limitations of the Study

This study has strengthened communication between the staff and the patients and their relatives, increasing satisfaction. The integrated care seems to improve patient experience and facilitate goal setting. The study was conducted in a European country with a well-developed health and care services for older people. It should be feasible to generalize the intervention.

On the other hand, all patients were evaluated by the same PMR physician, which can lead to subjectivity bias.

Conclusions

To entirely evaluate disability, it is necessary to use both instruments of cognitive and physical assessment. PMR evaluation in a skilled nursing facility resulted in a change in allocating therapeutic resources, establishing properly the rehabilitation goals. Moreover, integrated care methodology can be widespread in order to improve healthcare management. Further studies are needed to create and validate an objective instrument to assess disability taking into account both cognitive and physical impairment and to properly allocate rehabilitation resources.

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