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Adaptation of activity-based-costing (ABC) to calculate unit costs in Mental Health Care in Spain

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ABSTRACT – *Background:* To date, numerous cost-of-illness studies have been using methodologies that don't provide trustworthy results for decision making in mental health care.

Objectives: The aims of this paper are design and implement a cost methodology by process of patient's care to calculate unit costs in mental health in Spain in 2005 and compare the results with the reached ones by traditional methods.

Methods: We adapted Activity-Based-Costing to this field analyzing the organizational and management structure of Mental Health's public services in a region of Spain, Navarre, describing the processes of care to patient in each resource and calculating their cost.

Results: We implemented this methodology in all resources and obtained unit cost per service. There are great differences between our results and the ones calculated by traditional systems. We display one example of these disparities contrasting our cost with the reached one by the methodology of Diagnostic Related Group (DRG).

Conclusions: This cost methodology offers more advantages for management than traditional methods provide.

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Background

In last years, there has been a great concern about cost-of-illness studies in mental health care, since these papers are not using a solid cost methodology and so are not obtaining trustworthy results[1-11] and besides, the results obtained until now and the design of management tools based on them are quite little[10].

There are many deficiencies of traditional cost methodologies utilized to date; some studies calculate the total expenditure of patient's care for a certain mental pathology, but they don't obtain unit costs per patient or per service; this fact doesn't allow using the results for cost-effectiveness analysis or in

economic evaluations or in decision making about financing for example[12-16]. However, there are papers that calculate unit costs per patient or service but, most of them, are using tariffs or prices previously established; these figures are taken as valid but with their use, average costs are obtained that do not reveal the totality of emaciated resources by type of patient[12,17-23]. In other cases, if unit costs are calculated, the budgetary expenditure has been taken as the total consumption of resources in each service, and unit costs are the result of dividing that amount between the number of patients who have used the service; this average cost is not correct since the consumption of resources will be different according to patient's pathology; let's think about one Mental Health Centre, a schizophrenic patient will receive treatment mainly with psychiatrist and nurse, but a depressive person will spend more time with psychologist, so the cost of both people will be completely different. Moreover, there are many concepts, like amortizations of an investment, that are not included in the budgetary expenditure and so that cost calculated according to it, is not complete.

Due to the previously stated, it's necessary to design a solid methodology; it must be easy to implant, it should make possible the comparison at international level and provide reliable results for being used in any kind of economic evaluation (cost-effectiveness analysis, efficacy analysis, decision making about financing…); this is exactly our main aim of our paper, to get this methodology and compare our results with the reached ones by traditional methods.

Methods

We are going to analyze all schizophrenic patients (1,300 people) living in Navarre, region in the North of Spain with 600,000 habitants, because of relevance of this pathology[2,4,5,7,13]. We will evaluate all Mental Health's public services that specifically are: 9 Mental Health Centres, 2 Psychiatric Wards in Hospital, 2 Day-Hospitals, a Rehabilitation Clinic with two types of services provided (part-time hospitalization and day-centre) and a Long and Medium Term Residential Care.

Some instruments will be utilized in the development of this research: one of them is the European Service Mapping Schedule (ESMS), system of standardization of resources presented in 2000 and later adapted in some zones of Spain and specifically in Navarre[24-26]. Furthermore, we will compare our methodology with the traditional cost system used in each service: for example, we will use DRG system, tariffs fixed by Navarre's Government for some services or simply unit costs calculated by the staff of the resources.

We proceeded of this way: first of all, we analyzed the organizational and management structure of Mental Health's public services. With the consecution of this stage we had a clear vision of available services for patients and we knew how these services were related; this phase was carried out with a focal point with Director of Mental Health's area in Navarre, the person who better knows the framework of mental health in the region, who gave details of all Mental Health's public services during three meetings of 45 minutes approximately. Having all these data, we resorted of ESMS codes and we checked that all services were codified with the right code.

After, having an exhaustive knowledge about services, we followed having focal points, but in this case with personnel of each kind of service; maintaining 2 interviews of 30 minutes approximately with them, we managed to design the processes that identify care and management of each resource. These processes are identified with the group

of activities that cause expenses and represent a care's protocol of the service; in this way, we have developed a care's model for patients through the design of processes and the list of activities that compose them. For validating these models for each service, we formed a focal group, one per service with the directors, and 2 meetings were of one hour long. Finally we reached a consensus about these care's models.

Once we have this map of activities designed for each service, the next step consisted of allocation of resources to each process for being able to calculate unit costs. This task was not complicated because we had at our disposal all necessary information; we calculated unit costs per process and after, with this data, we easily obtained cost per patient by means of the aggregation of cost of processes that each patient had needed.

With all this data, we proceeded to design a spreadsheet for each service that can be updated next years without any complication.

Results

This methodology was implemented in all Mental Health's public services in Navarre; we have obtained very good results and unit costs per patient were calculated for all services in 2005 and were compared with the ones reached by traditional methodologies obtaining important differences. As one example of these outcomes, we display results for a specific service; we have chosen the Psychiatric Ward in Hospital because we can show differences in costs between our results and D.R.G. methodology that it's commonly accepted and used[17,27,28]. This resource is codified with R2, code of European Service Mapping Schedule (ESMS); in Figure 1, we show the organizational and management structure of Mental Health's public services. As we can observe, this service is taking care of patients coming from Mental Health Centres (80%), Day-Hospitals (5%) or Emergency Department (15%) and people discharged from it will go to Mental Health Centres, Day-Hospitals or Rehabilitation Clinic.

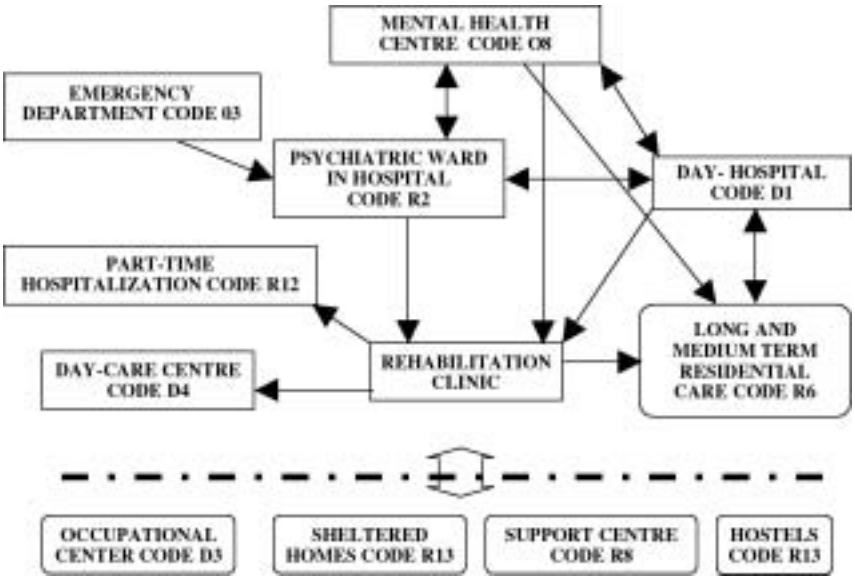

Figure 1. Map of Mental Health's Public Services in Navarre with links between them and ESMS codes.

The design of care's processes to patient in this service can be watched on Figure 2 according to the protocol of care to patient just as the focal group set. The description of the activities that compose each process and the allocation of resources implied in each one are displayed on Table I.

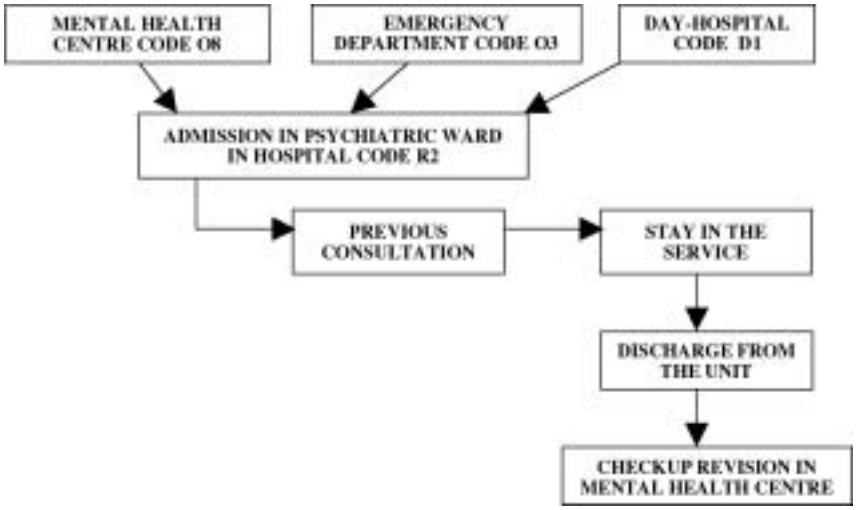

Figure 2. Design of care's processes to patient in Psychiatric Ward in Hospital in Navarre for schizophrenic patients.

Table I
Description of care's processes to schizophrenic patients in Psychiatric Ward in Hospital and allocation of necessary resources to carry out them.

Processes	Description	Personnel	Length
Admission in the service.	Patient's data registry.	Administrative Official	10 minutes
Previous consultation.	Evaluation consultation for diagnose and decide the treatment.	Psychiatrist.	1 hour
Stay in the unit.			
Blood general test.	Blood general test for detecting if there is abuse substance or something like that.	Nurse, laboratory personnel.	
Interview with relatives.	Interview with relatives.	Social worker.	45 minutes
Patient daily consultation.	Revision daily consultation for evaluating the patient's state.	Psychiatrist.	30 minutes
Feeding.	Catering given to the patients.	–	
Medicine treatment.	Specific unidose consumed by each patient.	–	
Daily care.	Daily care given to patients by morning shift.	3 nurses, 6 clinic assistants.	7 hours
	Daily care given to patients by afternoon shift.	4 nurses, 7 clinic assistants.	7 hours
	Daily care given to patients by night shift.	Nurse, 2 clinic assistants.	10 hours
Checkup consultation.	Checkup consultation after patient is discharged.	Mental Health Centre's psychiatrist.	30 minutes

The differences between ABC cost and DRG cost, group 430, is quite considerable just as Table II shows. We have considered a patient who stayed 17 days in this service in 2005.

Table II
Unit cost per process and per schizophrenic patient in Psychiatric Ward in Hospital and cost of DRG 430.

Processes	Unit costs (€) 2005
Admission in service	
Previous consultation	40
Stay	
Blood general test	20
Interview with relatives	35
Patient's consultation	330
Feeding	95
Medicine treatment	180
Daily care	2,100
Revision consultation	20
Common costs (laundry, sterilisation…)	205
Total cost	3,025 €
DRG 430 Cost	5,105 €

Discussion

Faced with the necessity of an improved methodology to calculate unit costs in mental health care, we have implemented ABC system obtaining results very different from the ones reached by traditional methods; in this way we have obtained cost per care's process since this alternative was already suggested as the best option but it had never been carried out[27,28].

ABC system presents many advantages against traditional ones. With our methodology we have got a better knowledge about cost components just as Table II shows. As processes' cost is detailed, we can know which of them supposes a bigger consumption of resources; however, with traditional methodologies we are not able to have at our disposal this information.

A second advantage of ABC methodology is that unit cost contains all necessary resources; let's remember that traditional methodologies are based on budgetary expenditure that is not complete because some concepts like amortizations are not included.

Moreover, this methodology makes possible cost calculation according to different temporal horizons; that is, we can calculate unit cost in a specific service per day, per month, per year or per stay; for example, in Table II we have calculated the cost for a stay of 17 days long, but if our patient had stayed 25 days the cost would be different and its calculation is very easy; this possibility is impossible with traditional systems as DRG in this case only gives one figure for all patients included in 430 group. This problem with DRG methodology has been already stated for many health's areas and Psychiatry is not an exception[27].

As well, it's worth mentioning that ABC methodology is not only an instrument to get unit costs of care based in process. This

method links cost calculation with the activities that characterize each process; for this reason, this system becomes a management tool very familiar and of easy understanding for service's personnel and directors since the list of activities of each process is an accurate reflection of work in each service. In this way, we can contrast the protocol of care's processes between areas from a medical point of view and perhaps improve care's patient.

In addition, we can affirm that if our cost is more analytic and reliable, many type of researches (cost-effectiveness analysis, efficacy analysis, comparisons between areas or any kind of economic evaluation) will improve their results; their conclusions will be more coherent than works made according to traditional costs.

Finally, one of the most important advantages of ABC methodology is based on the improvement of decision making about services' financing, provision of new services, reorganization of services... If we have at our disposal a better knowledge about cost components, unit cost per process, patient (differentiating for pathologies) and service as a whole, we are able to make a better decision than if we only know the traditional cost.

In spite of these properties, this methodology shows an important limitation that lies on the data compilation. If services' personnel and directors don't collaborate and don't help us to design and describe care's processes and allocate resources on them, this methodology can not be implemented. Without this closed collaboration, key element as it has been stated in previous papers[29], this system does not work. But as we have demonstrated, multidisciplinary work increases possibilities of success in the obtaining of trustworthy results.

Another limitation of this study is that we have only implemented ABC methodology in a region; it should be very interesting if we carried out the same work in another area for validating the use of ABC methodology in mental health care.

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