

Cost awareness among doctors in an Irish university-affiliated teaching hospital

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Abstract

Previous studies in USA and Canada have found that physicians and physicians in training have a limited understanding of medical care costs. In this study, we set out to survey all grades of doctors in the surgical department, emergency department, and anaesthetic department in a university-affiliated, Irish teaching hospital. Open-ended questionnaires on cost of 25 routinely used items in the hospital were sent to each department. The aims of the study were to assess the present knowledge of cost among the various grades of doctors, and to evaluate the level of professional experience on cost awareness and their confidence in their estimates. We had an overall response rate of 56.8% with 68.5% of doctors admitted to have estimated more than 90% of their responses. Ninety three percent of doctors have no confidence in their estimates on cost of listed items. We found that the lack of cost awareness was universal among doctors of all grades ($P = 0.236$). The doctors in our study population showed a high level of inaccuracy on their estimates of cost of routinely used items with 84% of the items overestimated. Our results were discouraging and demonstrated that considerable educational activity will be necessary if doctors are to be more cost effective in meeting the national health care budget.

Introduction

The profound changes in the last 10 years in the socioeconomic situation in the world have greatly transformed the public health systems.¹ Doctors are now not only involved in taking care of patients and their diseases, but also in controlling expenditure and meeting budget plans. Healthcare expenditure has become a pressing national issue and the focus of much political discussion, especially in current economic climate. The wastage of drugs, supplies, and disposable equipment has been shown to contribute, among others, to the inflationary

spiral in health care.² Although doctors are aware of the pressure to reduce cost, most are likely to be unfamiliar with the price of frequently used items. We set out to assess the present knowledge of cost among various grades of doctors in a university-affiliated teaching hospital, to evaluate the level of their professional experience on cost awareness, and the confidence in their cost estimates.

Materials and Methods

Cork University Hospital (CUH) in Cork, Ireland, is a Level I trauma and tertiary-care, university-affiliated teaching hospital. An open-ended questionnaire on cost of 25 routinely used items in the hospital was sent to all grades of doctors from trainees [Intern, Senior House Officer (SHO), Registrar (Reg), Specialist Registrar (SpR)] to consultants in surgical department, emergency department, and anaesthetic department. The response on costs of 25 commonly used items ranging from instruments to drugs was compared with the correct costs; response within a range $\pm 25\%$ of the true costs was arbitrarily considered correct. The true costs of all items were obtained from our Hospital Supplies Department and Pharmacy Department.

The grade of doctors, number of correct responses, percentage of doctors that estimated the cost of items in their response, and confidence in the accuracy of their estimates were recorded and analysed. All non-parametric data distributions were analysed with Kruskal-Wallis one-way analysis of variance and post-hoc Mann-Whitney U test to explore the difference in responses among the various grade of doctors. All categorical data were analysed with Chi-square (χ^2) test. An alpha of < 0.05 was considered to be statistically significant. All values were reported with their standard deviations.

Results

A total of 162 doctors in CUH was identified and included in our study. Of those, 47 were consultants and 115 were trainees. There were 92 (56.8%) respondents to our questionnaires with 32 (68.1%) of them from consultants and 60 (52.2%) from trainees. Among the trainees, SpR as the highest grade of trainee has the highest response rate followed by intern, SHO, and Reg (Table 1).

There was no statistical significance ($P=0.236$) in the number of correct response between the various grade of doctors with 68.5% of doctors admitted to have estimated more than 90% of their answers. The percentage of doctors that have estimated the cost of

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items in their response was not significantly ($P=0.883$) related to their grade. Ninety three percent of doctors have no confidence in their estimates on cost of listed items. Table 2 shows the items included in the questionnaires and the range of cost estimated by the doctors. The range of cost estimated for each item were highly variable for all items with 21 (84%) out of 25 items overestimated.

Discussion

The care of patients in medicine has become an increasingly challenging task for doctors. Medicine has evolved to become a healthcare, which is an amalgam of epidemiology, management theory, politics, and health economics. With the current economic climate and increasing budgetary concern in our healthcare system, hospital administrators are looking at every avenue to reduce healthcare cost at the suggestion of the payers and patients.³ In achieving a more effective use of resources, doctors have a role to play by improving cost efficiency in clinical practice. This role implies that doctors should have some knowledge of medical costs. An estimated 50-75% of annual healthcare expenditure is determined, directly or indirectly, by doctors who write prescriptions, order laboratory tests, recommend procedures, and admit-and-discharge patients from hospitals.⁴ In our study, although the items listed in our questionnaire appear routine and minor, they add up to nearly €531,000.00 a year. It is of great national interest therefore, to evaluate how much doctors are aware of the cost of items they routinely used or prescribed in the hospital setting.

Our study population showed poor cost awareness, with the majority of doctors highly

Table 1. The response rate, number of correct responses, percentage of doctors that estimated the cost of items in their responses, and confidence in their cost estimates among the various grades of doctors.

	Grade					P
	Consultant [n=47]	SpR [n=20]	Reg [n=36]	SHO [n=45]	Intern [n=14]	
Response rate (%)	32 (68.1%)	13 (65.0%)	17 (47.2%)	22 (48.9%)	8 (57.1%)	
Number of correct response (mean ± SE)	4.8±0.6 (0-14)	4.6±0.3 (3-7)	4.1±0.7 (0-12)	5.3±0.6 (2-12)	5.2±0.8 (3-10)	0.236
Percentage (%) of doctors estimated the cost of items (mean ± SE)	79.1±3.7 (30-100)	73.1±8.9 (10-90)	71.8±7.6 (0-100)	82.7±4.5 (10-100)	83.8±9.2 (20-100)	0.883
Confidence in cost estimates	Yes	3	3	1	1	0
	No	29	10	16	21	8

SpR, specialist registrar; Reg, registrar; SHO, senior house officer.

inaccurate with their cost estimates. Ninety one percent of them had only 8 or fewer correct responses out of 25 items listed. Most admitted to have estimated 90% or more of their responses, and have no confidence in their estimates. The level of professional experience has no significant impact on the level of cost awareness as demonstrated by the similar inaccuracies of cost estimates by all grades of doctors. Although previous studies have indicated that the cost of more expensive items tends to be more consistently underestimated, and inexpensive items overestimated, we did not find this to be the case in our study.^{5,6} Our doctors overestimated 84% of the items listed regardless of the price of the items. The range of estimates was also highly variable. Also, with a response rate of only 56.8%, this could reflect the level of interest among our doctors' in engaging themselves in healthcare budgeting.

Possible reasons for poor cost awareness among our doctors are likely to include a lack of emphasis on healthcare economics during medical academic years, poor cooperation between clinicians and administration, a perceived conflict of interest between patient care and budgetary concern, and lack of economic updating after medical school.

Influencing doctors' behaviour is a key element of a hospital's overall cost containment strategy.⁷ In view of escalating costs of healthcare, measures should be taken to optimise expenditure and maximise cost-effectiveness in their decision making. Doctors should be encouraged to make the transition from an absence of economic thinking to an economically oriented use of devices and drugs. Cost consideration in patient care should not be seen as a reduction in the level of care but as a way to optimise patient care. Public health administrations and academic organisations should also ensure that there are continuous educational programmes dedicated to cost awareness for doctors.

The results of our study are discouraging, and should alert us to the importance of creating cost awareness among doctors. Literature

Table 2. Cost of items estimate.

Items	Cost per year (€)	Cost per unit (€)	Range of estimates of cost per unit (€)
10 mL Sterile syringe	22,500.00	0.05	0.01-2.00
21 G Needle for injection	11,000.00	0.03	0.01-3.50
20 G Intravenous cannula	22,000.00	0.44	0.05-2.50
T-Port extension	47,000.00	0.71	0.03-2.50
Raytec gauze	4000.00	0.12	0.05-4.00
Jelonet gauze 5x5 cm	4000.00	0.11	0.05-8.00
Elastic bandage, flexa soft 15 cm	11,000.00	1.18	0.05-8.00
Mepore dressing	2200.00	0.27	0.05-6.00
Cellacast for splinting fractures	7000.00	3.25	0.75-40.00
7.5 Sterile biogel gloves	31,500.00	1.54	0.50-9.00
Surgical facial mask	2400.00	0.08	0.02-10.00
Disposable surgical gown X-large	125,000.00	2.75	0.60-20.00
Ethicon endo surgery - skin staplers PMW 35	20,500.00	8.00	0.20-100.00
4/0 Prolene	1100.00	1.86	0.10-15.00
3/0 Vicryl	500.00	2.27	0.10-20.00
4/0 Nylon (Ethilon)	900.00	1.42	0.10-25.00
Disposable surgical knife (Scalpel) – size 10	360.00	0.70	0.10-12.00
Disposable surgical drapes - aperture drape	3400.00	0.58	0.20-90.00
TED stocking	3600.00	6.30	1.00-20.00
16F foley catheter	2000.00	3.46	0.50-23.40
Fine-bore nasogastric feeding tube – 55"	23,500.00	19.81	1.00-50.00
1 L Hartmann's solution	22,260.00	2.77	0.40-20.00
Tinzaparin (Innohep) 3500 IU	83,312.00	1.74	1.00-100.00
1.2 g Intravenous Co-amoxycylav	78,824.00	4.06	1.00-25.00
1% Lignocaine with 1:200000 adrenaline vial	1135.00	1.65	0.30-27.62
Total	530,991.00		

review indicates several different ways of improving cost awareness among doctors. These include display of cost of items & monthly expenditure in strategic locations, providing cost data to physicians, a computer education program which includes the cost of each investigation when physicians place an order, and a Business of Medicine (BOM) curriculum integrated into medical school.⁷⁻¹⁰

In conclusion, the lack of cost awareness

appears universal among doctors. Both the consultants and trainees in our study population showed a high level of inaccuracy in their estimates of cost of routinely used items, reflecting poor cost awareness regardless of the level of professional experience. Considerable educational activity will be necessary in this area if we are to become more cost aware and efficient within our healthcare budgetary constraint.

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