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ORIGINAL ARTICLE

Emergency physician cost awareness of common orders in emergency department and awareness impact on medical decisions in Saudi Arabia

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ABSTRACT

Background: With growing emergency department visits, there has been a growth in national health expenditure. This situation is exacerbated by physicians ordering ineffective investigations and procedures. This study aimed to assess the emergency physician's awareness of the cost of diagnostic tests and interventions, and how awareness of costs may impact their medical decision.

Methods: This cross-sectional study was conducted among emergency physicians in Saudi Arabia. The data were collected via a self-administered questionnaire disseminated through emails to all physicians.

Results: A total of 233 physicians participated, the majority of whom were males (73%) and aged 24-34 years old (70.8%). Of the included physicians, 41.2% were junior residents, and three-quarters (75.5%) of the respondents had never worked in private hospitals. Two-thirds of respondents agreed/strongly agreed that knowing financial cost would affect their clinical practice.

Physicians tended to overestimate the cost of drugs while underestimating the cost of diagnostics and laboratory tests. The percentage of correct estimates was higher for diagnostics and laboratory (<30%), it was markedly higher than for drugs (9%). The effect of cost information showed a reduction in the median overall costs for the laboratories requested while there was no significant reduction in the costs of diagnosis and drugs. While in other scenarios, there was no significant reduction in the overall costs of drugs, laboratories, and diagnostics.

Conclusion: Our study highlights the importance of cost awareness among emergency physicians and demonstrates that increased cost awareness could potentially influence medical decision making.

Keywords: Economics, cost savings, cost-effectiveness analysis, health expenditures.

Introduction

Healthcare cost reduction is a key element in any healthcare system transformation [1]. In 2000, Saudi Arabia ranked 26th in overall health system performance among 190 of the world's health systems [2]. To support Vision 2030, Saudi Arabia has been transforming and redirecting various systems and resources to improve outcomes and minimize waste [3]. Over the last 13 years, the Ministry of Health budget has increased from around 25 million Saudi Arabian Riyals (SARs) in 2008 (5.6% of the total state budget), to over 79 million SAR in 2021 (8.2% of the total state budget) [4]. To address this challenge, the Ministry of Health is implementing a national strategy for healthcare cost reduction.

The national number of emergency department (ED) visits has been increasing each year, along with its cost per visit [5]. It is estimated that 4%-10% of the total healthcare budget is spent in the ED, and many of the medical

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investigations and procedures conducted do not improve patient outcomes [6]. Efforts for emergency care cost reduction need to be explored and guided by successful interventions including ED process reengineering [7]. With this in mind, it has become a priority for healthcare services around the world to introduce cost-effective practices without sacrificing patient care.

Laboratory investigation, radiological images, and medications represent a significant proportion of healthcare costs [8]. Within ED, laboratory and radiological investigation alone accounted for 21.6% of the total cost [7]. That being said, when physicians order unnecessary tests or tests that have a lesser monetary burden they will contribute to increasing healthcare costs without being aware of the issue.

Emergency physician's knowledge of the cost of the tests and interventions they perform daily is limited [9]. A systematic review of 14 studies by Allan and Lexchin [10] found that physicians' awareness of diagnostic and therapeutic medical care cost items is poor.

Most previous studies were focused on assessing physician's perceptions instead of measuring the actual impact of cost knowledge on medical decisions [6]. Information about the effect of cost knowledge on emergency physicians' decisions and their ordering behaviors is limited.

This study seeks to assess emergency physician's awareness of the cost of common diagnostic tests and interventions in the ED in Saudi Arabia and to assess how awareness of costs may impact their medical decision while assessing different clinical scenarios.

Materials and Methods

This cross-sectional study was conducted employing a convenience sampling technique to gather data from emergency physicians in Saudi Arabia during the period of May 2022 until May 2023. The study population consisted of emergency physicians working in Saudi Arabia, including consultants, registrars, and emergency residents. Interns and medical students working in ED and those who did not consent to participate were excluded from the study.

A self-administered questionnaire was developed to achieve the study objectives, which were to assess emergency physicians' awareness of common healthcare costs in the ED in Saudi Arabia and to evaluate the impact of cost awareness on their medical decision-making processes. The questionnaire was composed of three sections: demographic information (this section collected basic demographic data about the participating physicians), cost estimation (participants were asked to estimate the costs of 28 items, including laboratory tests, diagnostic tests, and medications), and clinical scenario to assess decision-making capability with and without showing the actual cost (two hypothetical scenarios were presented to assess whether the participants' knowledge of the costs of various items would lead to cost-saving decisions). After presenting each scenario to the participants, they could select from a predetermined order list (medications, laboratories, and imaging) all options to make their decisions for the two scenarios. Participants could review their decision after knowing the actual prices with the option to edit the selected list of orders before the final submission of the survey or keep the same order.

The questionnaire was created using a combination of current literature, consultations with emergency physicians, input from focus groups, and modifications of questions found in pre-existing surveys [6]. To ensure content validity, three emergency consultants who were in active practice for at least 5 years after fellowship training with considerable experience in teaching and clinical activities reviewed the survey and provided feedback on its design and content.

The questionnaire was distributed by email to all emergency physicians. The e-mails were retrieved with the help of the Saudi Commission for Health Specialties and Invitation for participation in the research were distributed at a major emergency medicine conference in Saudi Arabia.

The actual reference costs were obtained from the financial departments of two private hospitals and one government hospital. We compared each set of medication, laboratories, and imaging from these three different hospitals and took the lowest price for each item.

The collected data were transferred to the Social Package for Social Sciences (SPSS) for analysis. The categorical data were represented as frequency (percentages) while the continuous data were summarized using median (IQR). The chi-square test was employed to assess the association between categorical data. The *p*-value of <0.05 was considered significant.

Table 1. *Descriptive statistics for the study sample (n = 233).*

Variable (*n* = 233)	Frequency (%)
Age (years)	
25-34	165 (70.8%)
35-44	53 (22.7%)
45-54	12 (5.15%)
55-64	1 (0.43%)
65+	2 (0.86%)
Gender	
Female	63 (27.0%)
Male	170 (73.0%)
Current position	
Consultant	55 (23.6%)
Junior resident	96 (41.2%)
Registrar	14 (6.01%)
Senior registrar	17 (7.30%)
Senior resident	51 (21.9%)
Ever worked in private hospitals	
No, never worked in a private hospital	176 (75.5%)
Yes, currently working in a private hospital	23 (9.87%)
Yes, I used to work in a private hospital	34 (14.6%)
Years as an emergency physician	
<2	94 (40.3%)
2-5	64 (27.5%)
6-15	63 (27.0%)
16-25	10 (4.29%)
>25	2 (0.86%)
Ever received any formal training (online modules, courses, lectures, and so on) on the costs of medical testing?	
Yes	32 (13.7%)
No	201 (86.3%)

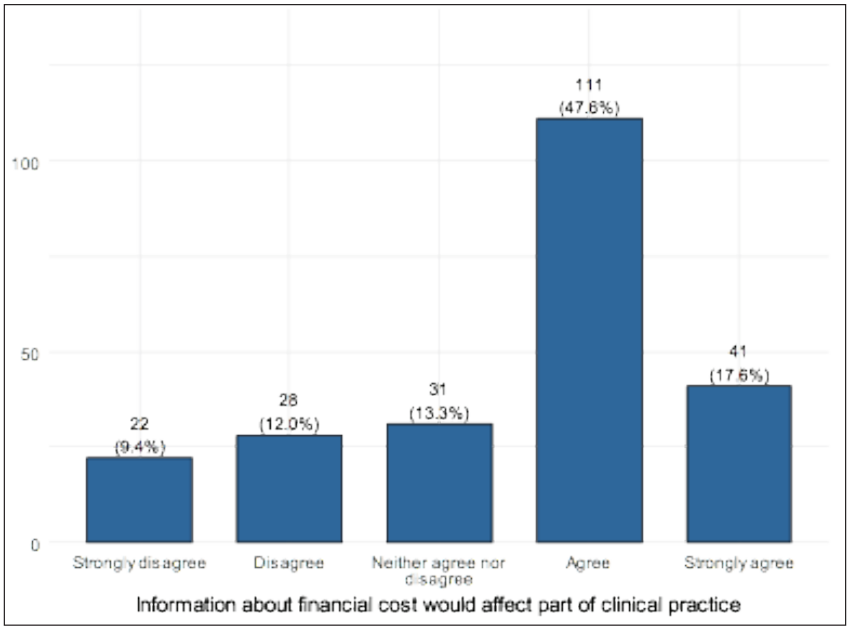

Figure 1. *Perception regarding information about financial costs.*

Result

A total of 233 physicians participated in the study. Approximately three-quarters (70.8%) of respondents were aged 24-34 years, and 22.7% were aged 35-44 years. The remaining ~5% were aged >45 years old. The majority of respondents were males (73%) while the remaining 27% were females. Of the included physicians, 41.2% were junior residents, 21.9% were senior residents, and 23.6% were consultants. Three-quarters (75.5%) of the respondents had never worked in private hospitals. More than one-half of the included physicians worked as emergency physicians for 2-15 years, and 40.3% worked as emergency physicians for <2 years (Table 1).

Results showed that approximately two-thirds of respondents agreed/strongly agreed that information about the financial cost would affect part of their clinical practice (Figure 1).

Physicians tended to overestimate the costs of drugs such as paracetamol (70%), morphine (93%), and metoclopramide, while they tended to underestimate the costs of diagnostics. Physicians tended to underestimate the costs of laboratory tests, except for the cost of COVID swabs which was overestimated by 48.5% of the physicians. Bone profile and venous blood gas (VBG) were the most underestimated laboratory tests, while lower limb ultrasound (US) and electrocardiogram (ECG) were the most underestimated diagnostics (65.67% and 71.24%, respectively) (Table 2).

The percentage of correct estimates was higher for diagnostics and laboratory data, although the percentages did not exceed 30%, it was markedly higher than for drugs (9% correct estimates) (Figure 2).

Results showed a reduction in the median overall costs for the laboratories requested (551 *vs.* 471, $p = 0.014$). The percentage of physicians who requested urine pregnancy testing, serum pregnancy testing, electrolytes, and VBG decreased following knowledge of costs. There was no significant reduction in the median overall costs of diagnosis and drugs, although the percentage of physicians who requested paracetamol and morphine increased following knowledge of the costs (Table 3).

In scenario 2, results showed a significant reduction in the percentage of physicians who requested amylase and lactate tests ($p = 0.01$ and 0.02, respectively). There was also a significant reduction in the number of physicians who requested US biliary testing ($p = 0.03$). However, there was no significant reduction in the overall costs of drugs, laboratories, and diagnostics (Table 4).

Physicians who currently worked in private hospitals were more likely to correctly estimate the costs of laboratories (43.5%) than physicians who never (23.9%) or used to work (26.5%) in private hospitals. Years as emergency physicians were also associated with correctly estimating the costs of diagnostics. The percentage of physicians who correctly estimated the costs of diagnostics increased with the increase in years of experience ($p = 0.038$). Junior (21.9%) and senior (27.5%) residents were the least likely to correctly estimate the costs of diagnostics while consultants were most likely to correctly estimate these costs (Table 5).

Analysis was performed using the chi-square test of independence.

Discussion

This study aimed to assess emergency physicians' awareness of common healthcare costs in the ED in Saudi Arabia and determine how cost awareness impacts their medical decision making. Our findings revealed several important insights into cost awareness and the influence of cost information on decision making among emergency physicians.

First, we found that approximately two-thirds of participating emergency physicians believed that information about financial costs would affect their

Table 2. *The proportion of low, correct, and high estimates of medication, laboratory tests, and imaging.*

	Estimates based on a 25% threshold			Estimates based on a 50% threshold		
	Low	Correct	High	Low	Correct	High
Drugs						
Paracetamol 1 g IV	23 (9.87%)	47 (20.17%)	163 (69.96%)	22 (9.44%)	49 (21.03%)	162 (69.53%)
Morphine 10 mg ampule IV	7 (3.00%)	9 (3.86%)	217 (93.13%)	6 (2.58%)	10 (4.29%)	217 (93.13%)
Metoclopramide 10 mg IV	5 (2.15%)	0 (0.00%)	228 (97.85%)	0 (0.00%)	8 (3.43%)	225 (96.57%)
Methylprednisolone 40 mg IV	13 (5.58%)	1 (0.43%)	219 (93.99%)	5 (2.15%)	21 (9.01%)	207 (88.84%)
Normal saline 1 l IV	58 (24.89%)	46 (19.74%)	129 (55.36%)	18 (7.73%)	88 (37.77%)	127 (54.51%)
Furosemide 80 mg IV	3 (1.29%)	3 (1.29%)	227 (97.42%)	3 (1.29%)	3 (1.29%)	227 (97.42%)
Insulin, 10 ml vial, contain 100 IU/ml IV	67 (28.76%)	49 (21.03%)	117 (50.21%)	39 (16.74%)	94 (40.34%)	100 (42.92%)
Transfusions of (PRBCs) 1 unit	66 (28.33%)	32 (13.73%)	135 (57.94%)	35 (15.02%)	73 (31.33%)	125 (53.65%)
Tazocin 4	39 (16.74%)	25 (10.73%)	169 (72.53%)	20 (8.58%)	50 (21.46%)	163 (69.96%)
Ceftriaxone 1 g IV	35 (15.02%)	40 (17.17%)	158 (67.81%)	20 (8.58%)	61 (26.18%)	152 (65.24%)
Potassium chlorideIV	0 (0.00%)	4 (1.72%)	229 (98.28%)	0 (0.00%)	4 (1.72%)	229 (98.28%)
Omeprazole 40 mg powder for solution for infusion	34 (14.59%)	42 (18.03%)	157 (67.38%)	29 (12.45%)	64 (27.47%)	140 (60.09%)
Laboratory tests						
Complete blood count (CBC) with differential	112 (48.07%)	61 (26.18%)	60 (25.75%)	91 (39.06%)	105 (45.06%)	37 (15.88%)
Urea and electrolytes (U&E)	183 (78.54%)	40 (17.17%)	10 (4.29%)	163 (69.96%)	64 (27.47%)	6 (2.58%)
Bone profile	195 (83.69%)	26 (11.16%)	12 (5.15%)	148 (63.52%)	80 (34.33%)	5 (2.15%)
Troponin	180 (77.25%)	37 (15.88%)	16 (6.87%)	124 (53.22%)	98 (42.06%)	11 (4.72%)
B-type natriuretic peptide (BNP)	152 (65.24%)	38 (16.31%)	43 (18.45%)	127 (54.51%)	82 (35.19%)	24 (10.30%)
Urine examination	134 (57.51%)	50 (21.46%)	49 (21.03%)	75 (32.19%)	111 (47.64%)	47 (20.17%)
VBG	190 (81.55%)	32 (13.73%)	11 (4.72%)	154 (66.09%)	73 (31.33%)	6 (2.58%)
COVID swab	46 (19.74%)	74 (31.76%)	113 (48.50%)	27 (11.59%)	97 (41.63%)	109 (46.78%)
Diagnostics						
X-ray chest	71 (30.47%)	72 (30.90%)	90 (38.63%)	57 (24.46%)	115 (49.36%)	61 (26.18%)
Computed tomography (CT) head	121 (51.93%)	81 (34.76%)	31 (13.30%)	73 (31.33%)	134 (57.51%)	26 (11.16%)
CT abdomen kidney urinary bladder (KUB)	99 (42.49%)	78 (33.48%)	56 (24.03%)	54 (23.18%)	136 (58.37%)	43 (18.45%)
CT abdomen withcontrast	77 (33.05%)	63 (27.04%)	93 (39.91%)	55 (23.61%)	121 (51.93%)	57 (24.46%)
US liver and biliary	107 (45.92%)	55 (23.61%)	71 (30.47%)	45 (19.31%)	150 (64.38%)	38 (16.31%)
US DVT lower limb	153 (65.67%)	51 (21.89%)	29 (12.45%)	92 (39.48%)	118 (50.64%)	23 (9.87%)
ECG	166 (71.24%)	44 (18.88%)	23 (9.87%)	117 (50.21%)	108 (46.35%)	8 (3.43%)
CT angiogrampulmonary arteries	130 (55.79%)	75 (32.19%)	28 (12.02%)	77 (33.05%)	136 (58.37%)	20 (8.58%)

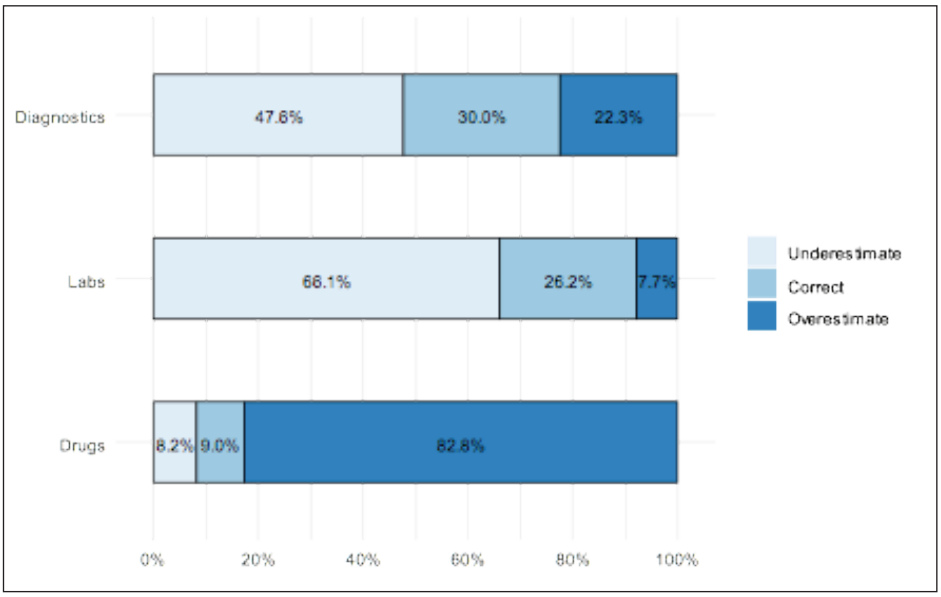

Figure 2. *The proportion of low, correct, and high overall estimates for drugs, laboratory data, and diagnostics.*

Table 3. *Scenario 1, Requested medication, laboratory data, and diagnostics before and after showing the prices.*

	Before (*n* = 233)	After (*n* = 233)	*p*-value
Drugs			
Paracetamol 1 g IV	61 (26.2%)	77 (33.0%)	<0.001
Ketorolac 30 mg IV	78 (33.5%)	77 (33.0%)	1.00
Metoclopramide 10 mg IV	155 (66.5%)	145 (62.2%)	0.03
Morphine 10 mg ampule IV	42 (18.0%)	56 (24.0%)	0.01
High flow O_2	35 (15.0%)	27 (11.6%)	0.10
Intranasal lidocaine	2 (0.86%)	4 (1.72%)	0.62
Sumatriptan 6 mg	21 (9.01%)	17 (7.30%)	0.45
Diphenhydramine syrup	7 (3.00%)	9 (3.86%)	0.68
diclofenac 75 mg IV	31 (13.3%)	28 (12.0%)	0.66
Naproxen	9 (3.86%)	12 (5.15%)	0.55
Valproic acid 400 mg IV	1 (0.43%)	5 (2.15%)	0.13
No need for medication	12 (5.15%)	16 (6.87%)	0.22
Ketamine	0 (0.00%)	0 (0.00%)	NaN
Total cost (Median/ IQR)	19.5 (8.13 34.4)	18.0 (7.66 29.1)	0.93
Laboratories			
CBC	175 (75.1%)	166 (71.2%)	0.05
Renal function test	127 (54.5%)	118 (50.6%)	0.11
Urine pregnancy test	82 (35.2%)	43 (18.5%)	<0.001
Serum pregnancy test	45 (19.3%)	73 (31.3%)	<0.001
Electrolyte	115 (49.4%)	92 (39.5%)	<0.001
Carbone monoxide	29 (12.4%)	29 (12.4%)	1.00
VBG	93 (39.9%)	58 (24.9%)	<0.001
Lactate	28 (12.0%)	20 (8.58%)	0.14
Lumbar puncture	30 (12.9%)	28 (12.0%)	0.79
No need for the lab	35 (15.0%)	41 (17.6%)	0.21
Total cost (Median/ IQR)	551 (245 784)	471 (113 649) 23	0.014
Diagnostics			
CT head with IV contrast	106 (45.5%)	107 (45.9%)	1.00
CT head without IV contrast	69 (29.6%)	63 (27.0%)	0.33
MRV	35 (15.0%)	34 (14.6%)	1.00
No need for imaging	39 (16.7%)	48 (20.6%)	0.07
Total cost (Mean ± SD)	1020 (862 1020)	1020 (862 1020)	0.664
Overall total (Mean ± SD)	1476 (1146 1904)	1414 (1040 1788)	0.132

Table 4. *Scenario 2, requested medication, laboratory data, and diagnostics before and after showing the prices.*

	Before (*n* = 233)	After (*n* = 233)	*p*-value
Drugs			
Paracetamol 1 g IV	69 (29.6%)	73 (31.3%)	0.39
Ketorolac 30m g IV	62 (26.6%)	62 (26.6%)	1
Morphine 10 mg ampule IV	99 (42.5%)	106 (45.5%)	0.15
Diclofenac 75 mg IV	53 (22.7%)	47 (20.2%)	0.11
Tramadol 50 mg/ ml IV	11 (4.72%)	11 (4.72%)	1
Fentanyl 50 µg/ ml IV	28 (12.0%)	25 (10.7%)	0.55
Total cost (Median/ IQR)	18.0 (6.80 23.0)	18.0 (6.80 23.0)	1
Laboratories			
CBC	187 (80.3%)	193 (82.8%)	0.18
Renal function test	159 (68.2%)	157 (67.4%)	0.84
Electrolytes	130 (55.8%)	121 (51.9%)	0.1
Liver function test	169 (72.5%)	163 (70.0%)	0.33
Urine pregnancy test	58 (24.9%)	56 (24.0%)	0.81
Urea breath test	3 (1.29%)	4 (1.72%)	1
Triglycerides	9 (3.86%)	6 (2.58%)	0.45
Lipase	114 (48.9%)	106 (45.5%)	0.12
Amylase	83 (35.6%)	69 (29.6%)	0.01
Lactate	34 (14.6%)	23 (9.87%)	0.02
Total cost (Median/ IQR)	585 (327 789)	551 (306 765)	0.26
Diagnostics			
CT head with IV contrast	20 (8.58%)	21 (9.01%)	1
CT head without IV contrast	32 (13.7%)	35 (15.0%)	0.65
Chest X-ray	32 (13.7%)	28 (12.0%)	0.29
US biliary	189 (81.1%)	180 (77.3%)	0.03
Abdominal X-ray	21 (9.01%)	18 (7.73%)	0.58
Total cost (Mean ± SD)	340 (340 550)	340 (340 550)	0.9814
Overall total (Mean ± SD)	1054 (807 1332)	1034 (725 1284)	0.536

clinical practice. This indicates that many physicians acknowledge the importance of cost considerations in healthcare delivery, potentially making them more receptive to cost-related education and interventions.

In our study, we found that physicians were more likely to overestimate the costs of medications, while they tended to underestimate the costs associated with imaging and laboratory tests. These findings are consistent with those from Grant Innes study, where rates of underestimation versus overestimation were reported as 68% versus 16% for imaging modalities, 23% versus 56% for laboratory tests, and 21% versus 64% for medications [9]. The similarity in these trends across both studies suggests that there may be a common pattern of cost awareness among physicians, wherein they are more inclined to overestimate drug costs but underestimate the expenses related to diagnostic tests. This observation highlights the need for targeted educational interventions to improve physicians' understanding of the cost distribution within the healthcare system, enabling them to make more informed and cost-effective decisions in their practice.

Due to the variety of patient presentations in the ED, the effectiveness of reducing the cost by presenting the actual cost will depend on the patient presentation. Our study shows upon revealing the actual costs of

Table 5. *Factors associated with overestimation or underestimation of costs.*

	Cost of drugs				Cost of laboratories				Cost of diagnostics			
	Under-estimate	Correct	Over-estimate	*p*	Under-estimate	Correct	Over-estimate	*p*	Under-estimate	Correct	Overe-stimate	*p*
	N = 19	*N* = 21	*N* = 193		*N* = 154	*N* = 61	*N* = 18		*N* = 111	*N* = 70	*N* = 52	
Age				0.510				0.592				0.117
25-34	13 (7.88%)	15 (9.09%)	137 (83.0%)		110 (66.7%)	44 (26.7%)	11 (6.67%)		79 (47.9%)	43 (26.1%)	43 (26.1%)	
35-44	5 (9.43%)	4 (7.55%)	44 (83.0%)		33 (62.3%)	15 (28.3%)	5 (9.43%)		24 (45.3%)	22 (41.5%)	7 (13.2%)	
45-54	1 (8.33%)	1 (8.33%)	10 (83.3%)		9 (75.0%)	2 (16.7%)	1 (8.33%)		7 (58.3%)	4 (33.3%)	1 (8.33%)	
55-64	0 (0.00%)	1 (100%)	0 (0.00%)		1 (100%)	0 (0.00%)	0 (0.00%)		1 (100%)	0 (0.00%)	0 (0.00%)	
65+	0 (0.00%)	0 (0.00%)	2 (100%)		1 (50.0%)	0 (0.00%)	1 (50.0%)		0 (0.00%)	1 (50.0%)	1 (50.0%)	
Gender				0.320				0.943				0.374
Female	3 (4.76%)	4 (6.35%)	56 (88.9%)		42 (66.7%)	17 (27.0%)	4 (6.35%)		28 (44.4%)	17 (27.0%)	18 (28.6%)	
Male	16 (9.41%)	17 (10.0%)	137 (80.6%)		112 (65.9%)	44 (25.9%)	14 (8.24%)		83 (48.8%)	53 (31.2%)	34 (20.0%)	
Current position				0.710				0.868				0.037
Consultant	3 (5.45%)	4 (7.27%)	48 (87.3%)		34 (61.8%)	15 (27.3%)	6 (10.9%)		22 (40.0%)	24 (43.6%)	9 (16.4%)	
Junior resident	11 (11.5%)	12 (12.5%)	73 (76.0%)		64 (66.7%)	25 (26.0%)	7 (7.29%)		54 (56.2%)	21 (21.9%)	21 (21.9%)	
Registrar	1 (7.14%)	1 (7.14%)	12 (85.7%)		11 (78.6%)	2 (14.3%)	1 (7.14%)		9 (64.3%)	4 (28.6%)	1 (7.14%)	
Senior registrar	0 (0.00%)	1 (5.88%)	16 (94.1%)		10 (58.8%)	5 (29.4%)	2 (11.8%)		4 (23.5%)	7 (41.2%)	6 (35.3%)	
Senior resident	4 (7.84%)	3 (5.88%)	44 (86.3%)		35 (68.6%)	14 (27.5%)	2 (3.92%)		22 (43.1%)	14 (27.5%)	15 (29.4%)	
Ever worked in private hospitals				0.952				0.009				0.341
Never worked in private hospital	15 (8.52%)	15 (8.52%)	146 (83.0%)		122 (69.3%)	42 (23.9%)	12 (6.82%)		86 (48.9%)	49 (27.8%)	41 (23.3%)	
Currently work in private hospital	2 (8.70%)	2 (8.70%)	19 (82.6%)		8 (34.8%)	10 (43.5%)	5 (21.7%)		7 (30.4%)	10 (43.5%)	6 (26.1%)	
Used to work in private hospital	2 (5.88%)	4 (11.8%)	28 (82.4%)		24 (70.6%)	9 (26.5%)	1 (2.94%)		18 (52.9%)	11 (32.4%)	5 (14.7%)	
Years as emergency physician				0.222				0.243				0.038
<2	11 (11.7%)	11 (11.7%)	72 (76.6%)		65 (69.1%)	20 (21.3%)	9 (9.57%)		53 (56.4%)	19 (20.2%)	22 (23.4%)	
2-5	2 (3.12%)	3 (4.69%)	59 (92.2%)		43 (67.2%)	18 (28.1%)	3 (4.69%)		24 (37.5%)	21 (32.8%)	19 (29.7%)	
6-15	5 (7.94%)	7 (11.1%)	51 (81.0%)		37 (58.7%)	22 (34.9%)	4 (6.35%)		30 (47.6%)	25 (39.7%)	8 (12.7%)	
16-25	1 (8.33%)	0 (0.00%)	11 (91.7%)		9 (75.0%)	1 (8.33%)	2 (16.7%)		4 (33.3%)	5 (41.7%)	3 (25.0%)	

Data were summarized as counts and percentages.

orders in the first scenario there was a reduction in the median overall costs for requested laboratory tests (p = 0.014), suggesting that increased cost awareness could positively impact physicians' ordering behaviors in some clinical scenarios. This finding aligns with the results of Cummings [11] study, which suggested that providing physicians with information about the prices of diagnostic tests before ordering them is an effective strategy for reducing the number of tests ordered. The concurrence of these outcomes emphasizes the potential benefits of equipping physicians with accurate and timely cost information. By doing so, it is possible to promote more efficient and cost-conscious decision making in the clinical setting, ultimately leading to better resource management and potential cost savings within the healthcare system.

Understanding the factors influencing cost awareness among emergency physicians is crucial for designing effective interventions to improve cost-conscious decision making. Our study identified several factors associated with better cost awareness, including higher levels of education, longer clinical experience, and previous exposure to cost information.

This study is not without limitations, the study design of a cross-sectional study comes with its inherent limitations and this study could not establish causality. Moreover, since this study used convenience sampling decreasing its generalizability to all emergency physicians. Despite its limitations, this study establishes a strong association between cost awareness and ED decisions. This study warrants further longitudinal studies to establish causalities.

Conclusion

Our study highlights the importance of cost awareness among emergency physicians and demonstrates that increased cost awareness could potentially influence medical decision making. These findings suggest that targeted educational interventions aimed at improving cost estimation accuracy could contribute to more efficient resource allocation and reduced healthcare spending. Future research should focus on evaluating the effectiveness of such interventions and exploring other factors that may impact cost awareness and decision making in ED.

List of Abbreviations

ED Emergency department

Funding

None.

Conflict of interest

The authors declare that there is no conflict of interest regarding the publication of this article.

Consent to participate

Written consent was obtained from all the participants.

Ethical approval

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