

# Cost Analysis of Individual Outpatient and Emergency Pharmacy Services in the Kingdom of Saudi Arabia

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## ABSTRACT

**Objectives:** In this study, we aimed to explore the cost of Individual outpatient and emergency pharmacy services in the Kingdom of Saudi Arabia. **Methods:** This is a descriptive analysis cross-sectional and questionnaire-based study. We used an electronic survey questionnaire with a judgment sampling system to obtain responses. The structured questionnaire consisted of two parts written in English and Arabic. The first part collected the demographic information of the responders based on multiple-choice questions. The second part contained questions for measuring the personal cost, including the salary cost of a head of ambulatory care or outpatient pharmacist, a clinical pharmacist working at ambulatory care, pharmacist and pharmacy technician, and secretary and porter per hour. The cost was calculated for the preparation time of each medication. The total costs of the place's overhead cost and cost of equipment used for the outpatient and emergency pharmacy services. Furthermore, the purchased materials and supplies and the non-salary cost were calculated. All costs were used in the US dollar currency. The data were collected through the Survey Monkey system and analyzed using Microsoft Excel version 2020. **Results:** The total of judgment responders was six directors of pharmacy. Five were responsible for outpatient pharmacy services, and one was responsible for emergency pharmacy. The majority of the outpatient and emergency pharmacy directors had work experience as pharmacy administrators for more than four years. The total cost of outpatient pharmacy services was 1581.95 USD, whereas the cost of emergency pharmacy services was 729.86 USD. The majority of the cost came from personnel cost from the outpatient pharmacy (1288.15 USD, 81.43%) followed by emergency pharmacy (465.28 USD, 63.75%) and material and supply cost (205 USD, 13.01%) at the outpatient pharmacy and emergency pharmacy services (228.89 USD, 31.36%). **Conclusion:** This study conducted the cost analysis of separate outpatient and emergency pharmacy services. Standardized pharmacy administrative and clinical activities are required, and we recommend more additional studies with a large sample size in the Kingdom of Saudi Arabia.

**Key words:** Cost, Separate, Emergency, Outpatient, Pharmacy, Kingdom of Saudi Arabia.

## INTRODUCTION

Pharmaceutical services have been expanding in the Kingdom of Saudi Arabia (KSA) over the past few years.<sup>1-4</sup> Pharmacy services have transformed from providing medication-oriented services to patient-oriented services. So far, the pharmaceutical care concept has been implemented at all types of healthcare institutions. Hospitals at KSA are practicing pharmacy administration programs and implementing the pharmacy administration skeleton and workforce, various patient care services, and specialized residency training programs.<sup>5-7</sup> Programs for pharmacy administration have been established in hospitals involving multiple aspects of practice, including inpatient pharmacy, outpatient pharmacy, drug information services, clinical pharmacy, extemporaneous preparation, and pharmacy store.<sup>7</sup> Such programs' implementation is based on the 2012–2022 pharmacy strategic plan.

A new pharmacy practice model with a well-stated vision was adopted in the pharmacy strategic plan consistent with Saudi Vision 2030.<sup>8,9</sup> The plan emphasized ambulatory care services with ensuring preventive medicine. A cost avoidance program of Saudi Managed Care Pharmacy has been implemented.<sup>10,11</sup> The program is called the Wasfaty system, and it requires dispensing of prescriptions by community pharmacies on behalf

of the Ministry of Health (MOH).<sup>10,11</sup> Various pharmacy services have been switched to providers who outsource pharmaceutical care services. Other services will follow the same model in the nearest future. There is a need to analyze the cost of pharmacy services planned to utilize the providers of outsourced pharmacy services. Several studies have been conducted to analyze the cost of pharmacy services such as total parental nutrition, drug information services, and drug distribution system at inpatient pharmacy.<sup>12-17</sup> However, to the best of our knowledge, studies regarding cost analysis of the separate outpatient and emergency pharmacy services are scarce. Therefore, in this study, we explored the cost analysis of separate outpatient and emergency pharmacy services at various hospitals in KSA.

## METHODS

### Study Design

This is a descriptive cross-sectional questionnaire-based study. We used an electronic survey questionnaire to obtain responses. The analysis was performed from October 2020 to February 2021, which included government and private hospital pharmacies in different KSA cities. The research ethics committee approved this study at Taif University.

### Participants and inclusion and exclusion criteria

Data were collected by judgment sample across KSA cities using an internet-based questionnaire. The questionnaire was filled by heads of pharmaceutical care services or someone they assigned. Government and private hospitals having either only outpatient pharmacies or only emergency pharmacies were included in this study. However, hospitals with less than 50-bed capacity and combined emergency pharmacy and inpatient pharmacy were excluded from this study.

### Data Collection Instrument

The questionnaire consisted of two parts and was written both in English and Arabic. The first part collected demographic information of the responders using multiple-choice questions. The second part contained multiple-choice questions measuring direct costs, including personnel costs (salaries of head of outpatient or emergency pharmacy, clinical pharmacist, pharmacist, pharmacy technician, secretary, and porter); material and supply costs (average cost of regular files, medications plastic bags, pens, masks, gloves, gowns, shoes, syringes with various sizes (small, medium, and large), Ziploc plastic bags with different sizes (small, medium, and large), and non-salary costs (education and training)); and overhead costs (e.g. place, computer, laptop, iPad, offices, landline telephone, mobile, software for inquiries documentations, printers, fax machines, copying machines, answering machines, refrigerators with various sizes (small, medium, and large), umber cabinets for medications storage, medications counters, managers' offices, chairs, controlled medications cabinets, medications shelves, tables for dispensing (benches), bar-code printers, pharmacy information systems, metal partitions between medications, manual or electronic boards, boxes for lose tablets or capsules, staplers, staff personal cabinets, temperature measurements machines, humidity measurements machines, and hand washing dishes).

### Validation of questionnaire

The questionnaire was validated for face and contents by expert reviewers. In addition, a pilot study was conducted by sending the questionnaire to some hospitals to confirm validity and absence of ambiguity and misleading questions.

### Data Analysis

Data were collected through the Survey Monkey system and analyzed using Microsoft Excel version 2020. All costs were calculated based on US dollars. Depreciation costs for all equipment were calculated based on five years of life expectancy and additional three years of annual depreciation cost. The depreciation cost was not considered for consumable materials. One-way sensitivity analysis was conducted to list discount prices and a variety of wage costs with 10–20%.<sup>12–17</sup>

## RESULTS

A total of 10 hospitals had outpatient and emergency pharmacy services. Of them, 8 had outpatient pharmacy services, and two had emergency pharmacy services. Six pharmacy directors. Five directors were responsible for outpatient pharmacy services, and one director was responsible for emergency pharmacy services. All outpatient pharmacy and emergency pharmacy services directors were males (100%). Most (80%) of the directors from outpatient pharmacies were aged 31–40 years. The pharmacy directors held a Diploma in Pharmacy (60%) and B.Sc. in Pharmacy degree (100%) (Table 1). The majority of the outpatient and emergency pharmacy directors had work experience for more than four years (Table 2). Most of the responders from the outpatient pharmacy were located in the western area (60%), whereas those from the emergency pharmacy were found in the central region. Most of the outpatient pharmacies belonged to the MOH (40%) or private hospitals

**Table 1: Responders Demographic Information.**

	OP Pharmacy		ER Pharmacy	
Gender	Response Count	Response Percent	Response Count	Response Percent
Male	4	100.00%	1	100.00%
Female	0	0.00%	0	0.00%
Answered question	4		1	
Skipped question	4		2	
Age	Response Count	Response Percent	Response Count	Response Percent
22-30 years	1	20.00%	0	0.00%
31-40	4	80.00%	1	100.00%
41-50	0	0.00%	0	0.00%
51-60	0	0.00%	0	0.00%
> 60	0	0.00%	0	0.00%
Answered question	5		1	
Skipped question	3		2	
Academic Qualification*	Response Count	Response Percent	Response Count	Response Percent
Diploma Pharmacy	0	0.00%	0	0.00%
BSc. Pharm	1	20.00%	1	100.00%
M.S	1	20.00%	0	0.00%
Msc. Clinical Pharmacy	0	0.00%	0	0.00%
Pharm.D.	3	60.00%	0	0.00%
Ph.D	0	0.00%	0	0.00%
MBA	0	0.00%	0	0.00%
PGY1	0	0.00%	0	0.00%
PGY2	0	0.00%	0	0.00%
PGY3	0	0.00%	0	0.00%
Fellowship	0	0.00%	0	0.00%
Other (please specify)	0	0.00%	0	0.00%
Answered question	5		1	
Skipped question	3		2	

\*Many options might be selected.

(40%), whereas the emergency pharmacy belonged to the MOH hospital (100%). In outpatient pharmacy hospitals, there were 200–299 beds (40%) and 400–499 beds (40%), and in emergency pharmacy hospitals, there were 50–99 beds (100%). The majority of the outpatient pharmacies and the emergency pharmacy hospitals were accredited by CBAHI (100%). All hospitals provide service to adult patients (100%), and most provide to adolescents or geriatric (80%) (Table 3). In outpatient pharmacy services, the total cost was 1581.95 USD with discount prices of 10–20% (1265.56–1423.75 USD), whereas, in the emergency pharmacy services, the total cost was 729.86 USD with discount prices of 10–20% (583.88–656.87 USD). Most of the cost came from personal costs from outpatient pharmacies (1288.15 USD, 81.43%) and emergency pharmacies (465.28 USD, 63.75%). Material and supply cost was (205 USD, 13.01%) at the outpatient pharmacy and (228.89 USD, 31.36%) at the emergency pharmacy (Tables 4 and 5). The average waiting time

**Table 2: Responders Years of Ewpxperience.**

Emergency Pharmacy Responders								
Years of experience in the following sections	Emergency Pharmacy		Outpatient Pharmacy		IV admixture		Pharmacy Administration	Total
	Count	Percent	Count	Percent	Count	Percent		
0	0	0.00%	0	0.00%	1	100.00%	0	0.00%
< 1 year	1	100.00%	0	0.00%	0	0.00%	0	0.00%
1-3	0	0.00%	0	0.00%	0	0.00%	0	0.00%
4-6	0	0.00%	0	0.00%	0	0.00%	1	100.00%
> 6 years	0	0.00%	0	0.00%	0	0.00%	1	100.00%
Answered question 1	1		5					
Skipped question 2	2		1					
Outpatient Pharmacy Responders								
Years of experience in the following sections	Emergency Pharmacy		Outpatient Pharmacy		IV admixture		Pharmacy Administration	Total
	Count	Percent	Count	Percent	Count	Percent		
0	0	0.00%	0	0.00%	0	0.00%	0	0.00%
< 1 year	1	100.00%	1	100.00%	1	100.00%	1	100.00%
1-3	0	0.00%	0	0.00%	0	0.00%	0	0.00%
4-6	0	0.00%	1	50.00%	0	0.00%	2	100.00%
> 6 years	0	0.00%	1	33.33%	0	0.00%	2	66.67%
Answered question 1	6		5					
Skipped question 2	2		1					

**Table 3: Hospital Pharmacies Demographic Information.**

Hospital regions	OP Pharmacy		ER Pharmacy	
	Response Count	Response Percent	Response Count	Response Percent
Central area	1	20.00%	2	100.00%
North area	0	0.00%	0	0.00%
South area	0	0.00%	0	0.00%
East area	1	20.00%	0	0.00%
West area	3	60.00%	0	0.00%
Answered question	5		2	
Skipped question	3		1	
Type of Hospitals	Response Count	Response Percent	Response Count	Response Percent
MOH Hospitals	2	40.00%	1	100.00%
Military hospitals	1	20.00%	0	0.00%
National Guard Hospital	0	0.00%	0	0.00%
Security forces hospitals	0	0.00%	0	0.00%
University hospital	0	0.00%	0	0.00%
Private hospitals	2	40.00%	0	0.00%
Community pharmacy	0	0.00%	0	0.00%
Other (please specify)	0	0.00%	0	0.00%
Answered question	5		1	
Skipped question	3		2	
No. of Licensed Beds	Response Count	Response Percent	Response Count	Response Percent
< 50	0	0.00%	0	0.00%
50-99	0	0.00%	1	100.00%
100-199	0	0.00%	0	0.00%
200-299	2	40.00%	0	0.00%
300-399	0	0.00%	0	0.00%
400-499	2	40.00%	0	0.00%
500 and above	0	0.00%	0	0.00%
Medical City	1	20.00%	0	0.00%
Answered question	5		1	
Skipped question	3		2	
Hospital accreditation*	Response Count	Response Percent	Response Count	Response Percent
CBAHI	5	100.00%	1	100.00%
Joint Commotion USA	2	40.00%	0	0.00%
Canada	0	0.00%	0	0.00%
Saudi Council	2	40.00%	0	0.00%
Other (please specify)	0	0.00%	0	0.00%
Answered question	5		1	
Skipped question	3		2	
The hospital service the following* populations	Response Count	Response Percent	Response Count	Response Percent
Neonates	3	60.00%	1	100.00%
Pediatric	3	60.00%	1	100.00%
Adolescent	4	80.00%	1	100.00%
Adults.	5	100.00%	1	100.00%
Geriatrics	4	80.00%	1	100.00%
Answered question	5		1	
Skipped question	3		2	

\*Many options might be selected.

**Table 4: Cost Analysis of Outpatient Pharmacy or Emergency Pharmacy Services.**

Cost Analysis Items	Outpatient Pharmacy Services		Emergency Pharmacy Services	
	Cost/24 hrs	Cost/hr	Cost/24 hrs	Cost/hr
<b>Personal Cost</b>				
Head of Outpatient Pharmacy	124.44	5.19	72.5	3.02
Clinical Pharmacist	367.41	15.31	55	2.29
Pharmacist	226.67	9.44	175.56	7.32
Pharmacy Technician	511.11	21.30	148.89	6.20
Secretary	31.85	1.33	0.00	0.00
Porter	26.67	1.11	13.33	0.56
Total	1288.15	53.67	465.28	19.39
<b>Overhead Cost</b>	<b>Cost/24 hrs</b>	<b>Cost/hr</b>	<b>Cost/24 hrs</b>	<b>Cost/hr</b>
Place	3.24	0.14	2.7	0.11
Computer	2.38	0.10	0.81	0.03
Laptop	0.43	0.02	0.00	0.00
iPad	0.00	0.00	0.00	0.00
Offices	2.16	0.09	0.27	0.01
Landline Telephone	0.76	0.03	0.27	0.01
Mobile	0.11	0.00	0.00	0.00
Software of Inquiries Documentations	0.22	0.01	0.00	0.00
Printer and Fax	1.51	0.06	0.54	0.02
Copy Machines	1.3	0.05	1.35	0.06
Answering Machine	0.22	0.01	0.00	0.00
Small Refrigerator for Medications	1.08	0.05	0.00	0.00
Medium Refrigerator for Medications	0.22	0.01	0.00	0.00
Big Refrigerator for Medications	10.81	0.45	1.89	0.08
Umber Cabinet for Medications	1.08	0.05	0.00	0.00
Medications Counter	6.7	0.28	5.41	0.23
Manager Office	1.51	0.06	0.27	0.01
Chairs	1.58	0.07	0.81	0.03
Controlled Medications Cabinet	3.46	0.14	1.22	0.05
Medications Shelves	5.62	0.23	5.41	0.23
Table for Dispensing (Pinch)	6.7	0.28	2.7	0.11
Bar-Code Printer	1.62	0.07	0.54	0.02
Pharmacy Information System	7.57	0.32	0.54	0.02
The Metal Partition Between Medications	2.17	0.09	1.89	0.08
Manual or Electronic Board	0.77	0.03	0.27	0.01
Boxes for Losing Tablets or Capsules	2.17	0.09	1.35	0.06
Stapler	0.22	0.01	0.05	0.00
Staff Personal Cabinet	0.01	0.00	0.00	0.00
Temperature Measurements Machines	3.25	0.14	1.35	0.06
Humidity Measurements Machines	3.25	0.14	1.35	0.06
Hand Washing Dish	0.54	0.02	0.81	0.03
Total	72.66	3.03	31.8	1.33

**Table 4: Con'td.**

Cost Analysis Items	Outpatient Pharmacy Services		Emergency Pharmacy Services	
	Cost/24 hrs	Cost/hr	Cost/24 hrs	Cost/hr
<b>Material And Supply</b>				
Regular Files	43.02	1.79	0.00	0.00
Medications Plastic Bags	17.78	0.74	177.78	7.41
Pens	1.78	0.07	2.22	0.09
Masks	17.78	0.74	11.11	0.46
Gloves	17.78	0.74	6.67	0.28
Gowns	1.96	0.08	0.00	0.00
Shoes	1.96	0.08	0.00	0.00
Small Size Syringe	5.87	0.24	0.00	0.00
Medium Size Syringe	16	0.67	0.00	0.00
Big Side Syringe	16	0.67	0.00	0.00
Small Size Ziploc Plastic Bag	26.67	1.11	11.11	0.46
Medium Size Ziploc Plastic Bag	3.56	0.15	0.00	0.00
Big Size Ziploc Plastic Bag	35.56	1.48	20	0.83
Total	205.72	8.57	228.89	9.54
<b>Non-Salary Cost</b>	<b>Cost/24 hrs</b>	<b>Cost/hr</b>	<b>Cost/24 hrs</b>	<b>Cost/hr</b>
Head of The Outpatient Pharmacy	1.28	0.05	0.35	0.01
Clinical Pharmacist	3.36	0.14	0.26	0.01
Pharmacist	2.33	0.10	0.84	0.04
Pharmacy Technician	4.67	0.19	0.82	0.03
Secretary	0.29	0.01	0.00	0.00
Porter	0.00	0.00	0.00	0.00
Internet	0.22	0.01	0.27	0.01
Library	3.24	0.14	1.35	0.06
Total	15.39	0.64	3.89	0.16

for preparing and dispensing one medication at an outpatient pharmacy and emergency pharmacy was (8.14) and (2.97) minutes, respectively. The costs of preparing and dispensing medicines at the outpatient pharmacy were respectively 1.098 USD per minute and (8.94) USD, whereas the preparation and dispensing cost at the emergency pharmacy was respectively (0.506 USD) per minute and (1.50) USD per medication dispensed (Table 6).

## DISCUSSION

Outpatient and emergency pharmacies provide vital services in the hospital. Both outpatient and emergency pharmacies provide services to ambulatory care visitors or emergency visitors. Such services might be supplied 24/7 or less on some occasions. Outpatient pharmacies can provide services alone in ambulatory care clinics without emergency pharmacy services. In other situations, outpatient pharmacies provide combined outpatient and emergency services for ambulatory care patients and emergency patients. Some hospitals have separate places and locations for outpatient pharmacy and emergency pharmacy sections with different benefits. In some hospitals, only separate emergency

Continued...

**Table 5: Type of Cost Derived at Outpatient Pharmacy or Emergency Pharmacy Sections.**

Type of Cost	Content of Items	Cost Outpatient Pharmacy Services / Day		Cost Emergency Pharmacy Services / Day	
		Cost (USD)	Percent	Cost (USD)	Percent
Personal Cost	Salaries of Head of the outpatient pharmacy, Clinical Pharmacist, pharmacist, pharmacy technician, secretary, and porter	1288.15	81.43%	465.28	63.75%
Overhead Cost	Equipment: Place, Computer, Laptop, iPad, Offices, Landline telephone, Mobile, Software of inquiries documentations, Printer, and fax, Copy machines, Answering machine, Small Refrigerator for medications, Medium Refrigerator for medications, Big Refrigerator for medications, Umber Cabinet for medications, Medications counter, Manager office, Chairs, Controlled medications cabinet, Medications shelves, Table for dispensing (Pinch), Bar-code printer, Pharmacy information system, the Metal partition between medications, Manual or electronic board, Boxes for losing tablets or capsules, Stapler, Staff personal cabinet, Temperature measurements machines, Humidity measurements machines, and Handwashing dish	72.66	4.59%	31.8	4.36%
Material And Supply Cost	The average cost of Regular files, Medication plastic bags, Pens, Masks, Gloves, Gowns, Shoes, Small size syringe, Medium size syringe, Big side syringe, Small size Ziploc plastic bag, Medium size Ziploc plastic bag, and Big size Ziploc plastic bag	205.75	13.01%	228.89	31.36%
Non-Salary Cost	Education and Training	15.39	0.97%	3.89	0.53%
	Pharmacy references and resources				
Total USD		1581.95		729.86	
Total Cost After Discount 10%		1,423.75		656.87	
Total Cost After Discount 20%		1,265.56		583.88	

**Table 6: Cost (USD) Analysis of Preparation and Dispensing at an Outpatient Pharmacy or Emergency Pharmacy Services.**

Outpatient Pharmacy Services				
Type of Medications	No of Medications /Day	Preparation and Dispensing Time / One Medication	Cost (USD) of Preparation and Dispensing / One Medication	Total Cost (USD) of Preparation and Dispensing / Day
Fast-Moving Item	25	6	6.59	164.70
Regular Medications	21	7.8	8.56	179.85
Narcotics Medications	15	9.38	10.30	154.49
Controlled Medications	13.75	9.38	10.30	141.61
Average	18.68	8.14	8.93	160.16
Emergency Pharmacy Services				
Type of Medications	No of Medications /Day	Preparation and Dispensing Time / One Medication	Cost (USD) of Preparation and Dispensing / One Medication	Total Cost of Preparation and Dispensing / Day
Fast-Moving Item	21.88	2.38	1.20	26.35
Regular Medications	20.63	1.5	0.76	15.66
Narcotics Medications	9.63	4	2.02	19.49
Controlled Medications	11.25	4	2.02	22.77
Average	15.84	2.97	1.5	21.06

pharmacies provide services to emergency patients without having outpatient pharmacy services. Every kind of outpatient or emergency pharmacy service needs unique cost analysis and assessment. This study analyzed the cost for only outpatient pharmacies without emergency services and only emergency pharmacies without outpatient services.

This study used a judgment sample for cost analysis because much information about cost analysis is not generally distributed. Heads of pharmacies know the costs of such services. There were no data available about the type of outpatient pharmacy or emergency pharmacy among all government or private hospitals in KSA. Therefore, we choose the individual judgment of the head of the pharmacy. Our results showed that two hospitals had emergency pharmacies alone; only one pharmacy responded. However, eight hospitals only had outpatient pharmacies, with a 50–62% response rate. All the responders were males who had enough experience to provide appropriate answers about cost information. All outpatient and emergency pharmacy services serve all types of patients, including adults and geriatrics, reflecting actual cost analysis practice.

The hospitals with outpatient pharmacies were from MOH and private hospitals, which gives us an excellent opportunity to analyze average costs. The only emergency pharmacy was from MOH because they do not exist at private or governmental institutions other than MOH. The different sizes of occupied beds were suitable, reflecting the average cost in the outpatient pharmacy. However, emergency pharmacies represented small hospitals only. All respondents working at outpatient pharmacies and emergency pharmacies had accreditation from CBAHI. If CBAHI accredits the hospital pharmacies, that's reflected the ideal situation for providing minimum pharmacy services, which good setting for calculating the cost of ambulatory care or emergency pharmacy. The cost of outpatient pharmacy was higher than the emergency pharmacy, which could be because more pharmacists work at outpatient pharmacies. Most of the costs in outpatient pharmacy and emergency pharmacy services came from personnel expenses, which agrees with the results of previous studies.<sup>15–17</sup> The second top cost came from material and supplies. There was not much overhead cost as there was not much equipment in pharmacies. This result is contradictory to previous studies.<sup>15–17</sup> The average preparation and dispensing time for the medication at an emergency pharmacy was lower than outpatient pharmacy. That's was because emergency pharmacy dispenses simple prescriptions, whereas outpatient pharmacy dispenses narcotics medications for more chronic diseases. Both outpatient or emergency pharmacy waiting times were shorter than the average waiting time at ambulatory care pharmacies of the previous study.<sup>18</sup> This might be because more medications had been dispensed per prescription in the previous study.<sup>18</sup> In this study, the cost of preparing and dispensing medicines at an outpatient pharmacy was much more than an emergency pharmacy, which is expected because of different cost settings. The cost of outpatient pharmacy dispensing medication services for adults, pediatric, or neonates considered as reimbursement resembles previous studies.<sup>15–17</sup> To reduce high daily costs, we suggest switching all outpatient and emergency pharmacy services to Saudi Managed Care Pharmacy called (Wasfaty) system.<sup>10,11</sup> Otherwise provide various patient care services each activity properly cost (2.11) USD per minute. There are different patient care services: Drug Utilization Evaluation (DUE), Pharm D student training, residency training, responding to drug information inquires, adverse drug reaction identification and reporting, medications errors preventing and monitoring, and patient counseling. Besides, the pharmacokinetic consultation, CPR team participation, setting and evaluating therapeutic guidelines, and policies and procedure design.<sup>19</sup>

## Limitations

There were some limitations in this study. The first is that fewer hospitals were participating. Second, there was some information regarding cost analysis was not available to respondents something lead to leaving some questions without answers.

## CONCLUSION

This is the first study conducted on cost analysis of individual outpatient pharmacy and emergency pharmacy services in the KSA. However, further investigation with more hospitals is highly warranted to confirm the cost analysis of outpatient pharmacy and emergency pharmacy in the KSA.

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None.

## CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

## Funding

None

## Consent for Publications

Informed consent was obtained from all the participants


## Ethical Approval

The research ethics committee approved this study at Taif University.

## ABBREVIATIONS

**MOH:** Ministry of Health; **KSA:** Kingdom of Saudi Arabia; **USD:** United State Dollar; **OPD:** Outpatient Department Pharmacy; **ER:** Emergency; **DIC:** Drug Information Center; **USD:** United State Dollars; **CBAHI:** Saudi Central Board for Accreditation of Healthcare Institutions; **DUE:** Drug Utilization Evaluation; **CPR:** Cardiopulmonary Resuscitations.

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