

Cost Analysis of Drug Information Services at the Mental Hospital in Saudi Arabia

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Abstract

Objective: To explore the cost analysis of drug information services at the mental hospital in Saudi Arabia.

Method: It retrospective cost analysis of drug information services past four years and a half at a mental hospital in Riyadh city, Saudi Arabia. It 500-bed of Psychiatry and addition hospitals in Riyadh city. The analysis included the variable expenses included personal cost, material and supply cost, Fixed expenses including direct cost, non-salary cost, and overhead cost The cost drives from Ministry of Health information database. All cost used US dollar currency. **Results:** The estimated total cost of delivery of the drug information services for four years and a half was (117,362.52) USD and (26,080.56) USD annually. The majority of cost came from personal cost (81.80%, direct cost (5.24%) followed by overhead cost (5.15%) and Non-Salary cost (4.99%). The average cost of answering drug information inquiries (108.27) USD. The highest cost of delivery of inquiries per type was an adverse drug reaction, stability and poisoning and toxicology (3.15). The highest cost delivered drug information center for each inquiry to healthcare providers as follows; the physician cost (4.2) USD, pharmacist cost (3.15) USD, and nurse cost (1.575). The highest cost utilized drug information resources for each inquiry as follows; Prescribing guidelines in psychiatry (340.20) USD, Drug.com (275.10) USD, and Medscape was (236.25) USD. **Conclusion:** The cost of drug information services was justified despite the limited resources. More drug information services needed to expand cover more services, healthcare providers, and patients.

Key words: Cost analysis, Drug information, Mental hospital, Ministry of Health, Saudi Arabia.

INTRODUCTION

The Pharmacoeconomics program started at Ministry of Health in 2014 as part of the implementation of Pharmacy strategic goals.^[1] The pharmacy administration formulated a central committee of the program representing twenty regions. The significant element of the program was a cost analysis of pharmacy services, measure the economic burden of pharmacy practice programs. Several publications founded in Saudi Arabia that have calculated the cost of Pharmacy services including total parental nutrition, drug distribution system for adults and pediatrics.^[2-6] However, the cost of running drug information services not existed yet. Also, the authors not familiar with any studies of analysis cost of drug information services at the mental hospital. The objective of the study to explore the cost services of drug information services at mental health care hospital in Riyadh Region of Kingdom of Saudi Arabia.

METHOD

It retrospective cost analysis of drug information services past four years and a half at a mental hospital in Riyadh city, Saudi Arabia. It 600-bed of Psychiatry and addition hospitals in Riyadh city. It had inpatient admission and ambulatory care clinics, and Emergency departments. The hospital had a different specialty for adults and pediatrics. The hospital treats the common

psychiatric illness including depression, bipolar and schizophrenia. In addition to addiction diseases. The hospital had pharmacy serve the patient including inpatient pharmacy with units dose drug distribution system, outpatient pharmacy, and home healthcare services, and drug information center. The pharmacy computerized physician order entry with an electronic prescription. The pharmacy clinical pharmacy and satellite pharmacy to monitor and follow the patient. Also, the clinical pharmacist shared in the round with the medical team and operated clozapine and patient counseling clinics. The pharmacy had medications safety program and with electronic clinical pharmacy documentation. In addition to annual pharmacy psychiatric symposium and clinical and pharmacy student training programs. The drug information center receiving inquiries from healthcare staff over eight hours per days for five days per a week, updated the hospital formulary and make drug evaluation for a new addition or deletion from hospital formulary, and participated in the Pharmacy and Therapeutic committees. Also, the drug information shared in the training of pharmacy students, pharmacy staff, and distribute public drug information to all visitors. The analysis of the cost included the variable expenses included personal cost, material and supply cost, Fixed expenses including direct cost, non-salary cost, and overhead cost.^[7] The cost derived from Ministry of Health information database. The author used two methods to calculate each type of question or references utilization or per caller. The first method was the total cost distributed according to their

percentages, while the second method of cost calculation was according to time spent multiply the time cost needed. All cost used US dollar currency. The format analyzed through the Microsoft Excel sheet version 10th.

RESULTS

The estimated total cost of delivery of the drug information services for four years and a half was (117,362.52) USD and (26,080.56) USD annually. The majority of cost came from personal cost (81.80%, direct cost (5.24%) followed by overhead cost (5.15%) and Non-Salary cost (4.99%) as explored in Table 1. The average cost of answering drug information inquiries (108.27) USD. The highest cost of delivery of inquiries per type was pharmacoeconomics ((394.86) USD and drug dosing (300.73) USD followed by poisoning and toxicology (196.91) USD and drug of choice (61.23) USD in the first method of cost calculations. While by used the second the method the highest was an adverse drug reaction, stability and poisoning and toxicology (3.15) USD as explored in Table 2. The highest cost delivered drug information center each inquiry to healthcare providers as follows; the physician cost (192.84) USD, pharmacist cost (39.84) USD, and patient cost (33.47) USD through utilization of the first method. While

in the second method the physician cost (4.2) USD, pharmacist cost (3.15) USD, and nurse cost (1.575) USD as explored in Table 3. The highest cost utilized drug information resources for each inquiry as follows; the Lexi-comp drug information cost (21,614.13) USD, Others cost (6,342.68) USD and Nice guidelines cost (246.46) USD used the first method. While finding the highest cost was Prescribing guidelines in psychiatry (340.20) USD, Drug.com (275.10) USD and Medscape was (236.25) USD as explored in Table 4.

DISCUSSION

The last pharmacy strategic plan at Ministry of Health started in early 2013 and continued to 2016.^[1] Over those periods, several clinical Pharmacy implemented and necessary pharmacy practice founded.^[8] All those professionals' services provided by distribution pharmacist and a clinical pharmacist with the assistance of a pharmacy technician. In late 2016, the new Saudi vision 2030 established several strategic healthcare goals.^[9] The updated plan of healthcare strategic released in 2017 with the emphasis on the best utilization and engagement of private healthcare providers.^[10] To implement the strategic plan, the cost of healthcare services measurements should implement. The authors tried to measure the cost of services the drug

Table 1: Cost analysis of drug information inquiries (USD).

characteristics	Cost of daily 0.4FTE	Monthly cost	Annual cost	Total cost of 4.5 years	Percent
Personal					
Head of drug information center	0.00	0.00	0.00	0.00	0.00%
Clinical Pharmacist	0.00	0.00	0.00	0.00	0.00%
Pharmacist	80.81	1,777.82	21,333.84	96,002.28	81.80%
Pharmacy technician	0.00	0.00	0.00	0.00	0.00%
Secretary	0.00	0.00	0.00	0.00	0.00%
Porter	0.00	0.00	0.00	0.00	0.00%
Over Head cost		0.00	0.00	0.00	
Place	0.00	0.00	0.00	0.00	0.00%
Computer	1.85	40.70	488.40	2,197.80	1.87%
Laptop	0.00	0.00	0.00	0.00	0.00%
iPad	0.00	0.00	0.00	0.00	0.00%
Landline telephone	0.46	10.12	121.44	546.48	0.47%
Mobile	0.00	0.00	0.00	0.00	0.00%
Software of inquiries documentations	0.00	0.00	0.00	0.00	0.00%
Printer and fax	2.78	61.16	733.92	3,302.64	2.81%
Copy machines	0.00	0.00	0.00	0.00	0.00%
Answering machine	0.00	0.00	0.00	0.00	0.00%
Others	0.00	0.00	0.00	0.00	0.00%
Material and Supply		0.00	0.00	0.00	
Offices	2.78	61.16	733.92	3,302.64	2.81%
Non Salary cost		0.00	0.00	0.00	
Education and Training	4.93	108.46	1,301.52	5,856.84	4.99%
Direct cost		0.00	0.00	0.00	
Internet	3.33	73.26	879.12	3,956.04	3.37%
Library	1.85	40.70	488.40	2,197.80	1.87%
Total	98.79	2,173.38	26,080.56	117,362.52	

Table 2: The cost analysis of the type of drug information inquiries (USD).

S.no	Characteristics	Cost calculation by founded on drug information services			Cost calculation by workload analysis			
		Total acquisition cost	Number of question over 4.5 years	Cost of drug information inquiries classification for each type question	Average time per each inquiry (minutes)	Cost of services per minute	Total cost	Cost of drug information inquiries classification for each type question
1	Adverse drug reaction	8,325.54	172	48.40	15	0.210	541.80	3.15
2	Drug interaction	9,706.67	186	52.19	5	0.210	195.30	1.05
3	Dosage	81,197.39	270	300.73	5	0.210	283.50	1.05
4	Availability	394.86	44	8.97	2	0.210	18.48	0.42
5	Stability	312.49	33	9.47	15	0.210	103.95	3.15
6	Drug of choice, therapeutics, pharmacology	12,430.52	203	61.23	20	0.210	852.60	4.2
7	Identification	223.21	83	2.69	5	0.210	87.15	1.05
8	Method of administration	1,315.38	40	32.88	5	0.210	42.00	1.05
9	Pharmacoeconomics	394.86	1	394.86	20	0.210	4.20	4.2
10	Pregnancy, lactation	1,562.47	44	35.51	7.5	0.210	69.30	1.575
11	Poisoning, toxicology	787.64	4	196.91	15	0.210	12.60	3.15
12	Others	711.50	25	28.46	20	0.210	105.00	4.2
		117,362.52	1084	108.27			2,315.88	

Table 3: The cost analysis of drug information caller asked the inquiries (USD).

SN	Characteristics	Cost calculation by founded on drug information services			Cost calculation by workload analysis			
		Total acquisition cost	Number of question over 4.5 years	Cost of drug information inquiries	Average time per each inquiry	Cost of services per minute	Total cost	Cost of drug information inquiries
1	Physician	95,072.37	493	192.84	20	0.210	2,070.60	4.2
2	Pharmacist	20,041.60	503	39.84	15	0.210	1,584.45	3.15
3	Nurse	180.64	17	10.63	7.5	0.210	26.78	1.575
4	Patient	1,640.11	49	33.47	5	0.210	51.45	1.05
5	Other	427.80	22	19.45	5	0.210	23.10	1.05
	Total	117,362.52	1084	108.27			3,756.38	

information services at the mental hospital in Riyadh City Saudi Arabia. The results should the cost of drug information services is high despite absent of several things, for instance, the complete drug information references and specialized clinical drug information pharmacist and may expected the cost of services more than calculated one. The most cost services came from personal cost, and that expected because of the drug information services, not utilization any high expensive equipment or material, and thus not consumed high percentages. That's results resemble what reported in cost of delivery medication management therapy in the cost percentages distribution among the total cost.^[7] It different what report other investigations because of the expensive equipment's used.^[3,5,11] The second high cost came from overhead. It was not so high because the building is free of charge. The results resemble what reported in the literature among the total cost.^[7] The authors used two methods to calculate the cost of inquiries according to the type. In the first method, the higher cost per question was Pharmacoeconomic

and poisoning, and that is because the number of questions was berry few. While drug dosing cost the second one and that is expected because of the second highest type of drug information inquiries. The second used the highest cost was an adverse drug reaction, stability, and poisoning inquiries. That is related to spending more time spent with searching and answering the questions. That is a defect in reality while the first overestimated the cost. The high cost of services related to the caller was physicians them the pharmacist despite the last had more inquiries than physicians. That is because of more time needed to answer the physician drug inquiries. The cost of services related of type references; in the first method used the high cost was Lexicomp drug information, other references nice guidelines and While the second method showed drug com website, Medscape and prescribing. The second method of cost calculation reflected the practice because those references most frequently used while the first method overestimates the cost. Some previous results not compared because non availability

Table 4: The cost analysis (USD) VS drug information resources utilized to answer the inquiries.

SN	Type of references	Cost calculation by founded on drug information services			Cost calculation by workload analysis			
		Total acquisition cost	Number of question over 4.5 years	Cost of drug information inquiries provided for each question per reference	Average time per each inquiry (minutes)	Cost of services per minute	Total cost	Cost of drug information inquiries provided for each question per reference
1	Drugs.com	51,271.74	262	195.69	5	0.210	275.10	1.05
2	Medscape	7,662.67	225	34.06	5	0.210	236.25	1.05
3	Prescribing guidelines in psychiatry	8,053.42	162	49.71	10	0.210	340.20	2.1
4	BNF	557.29	30	18.58	5	0.210	31.50	1.05
5	Lexi-comp drug information	43,228.26	2	21,614.13	5	0.210	2.10	1.05
6	Nice guidelines	246.46	1	246.46	5	0.210	1.05	1.05
7	Others	6,342.68	1	6,342.68	15	0.210	3.15	3.15
		117,362.52	415	282.80			889.35	

of literature support. The study is the first investigation done on the cost of drug information services in the Mental hospital of Ministry of Health in Kingdom, Gulf and Middle East counties. The study may utilize to calculate the cost avoidance as the impact of drug information center at mental hospital and cost of selling services outside the hospital.

CONCLUSION

The cost of drug information services was established at a mental hospital in Saudi Arabia. The pharmacy department may improve the services and expand as well as sell the services to another mental hospital through the implementation of Saudi Vision 2030. In addition to transformation into privatization and forecasting future revenue from the services in the future.

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CONFLICT OF INTEREST

None.

ABBREVIATIONS

KSA: Kingdom of Saudi Arabia; ASHP: American Society of Health-System Pharmacist; MOH: Ministry of Health; USA: United States of America.

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