

## RESEARCH ARTICLE

## OPEN ACCESS

# The Cost Analysis of Network Drug Information Services at Ministry of Health Institutions in Saudi Arabia

Yousef Ahmed Alomi<sup>1,\*</sup>, Sultan Mohammed Al-Jarallah<sup>2</sup>

<sup>1</sup>The Former General Manager of General Administration of Pharmaceutical Care and Former Head, National Clinical Pharmacy and Pharmacy Practice and Pharmacy R & D Administration, Ministry of Health, Riyadh, SAUDI ARABIA.

<sup>2</sup>Head, Ambulatory Care Pharmacy, Oncology and Hematology Clinical Pharmacist, Pharmaceutical Care Department, Security Forces Hospital, Riyadh, SAUDI ARABIA.

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\*Correspondence to:

Dr. Yousef Ahmed Alomi,

The Former General Manager of General Administration of Pharmaceutical Care, Former Head, National Clinical Pharmacy and Pharmacy Practice Head, Pharmacy R & D Administration Ministry of Health, Riyadh, SAUDI ARABIA.

Email: [yalomi@gmail.com](mailto:yalomi@gmail.com)

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## Abstract

**Objective:** To explore analysis cost of network Drug Information Services at Ministry of Health institutions. **Methods:** It is cost simulation of a 2-months cross-sectional survey of all drug information centers at MOH Hospitals. Any drug opened and provided services to health care professionals and the public participated in the questionnaire. All type of drug information centers national or regional or local at healthcare institutions including in the survey. All type of hospitals or primary care centers included in the survey (public, pediatric, maternity, psychiatry) included in the study. The survey consisted of two part. Demographics data and the second part included the variable expenses included personal cost, material and supply cost, Fixed expenses including direct cost, non-salary cost and overhead cost. All cost used as United States dollar currency. **Results:** The survey distributed to sixty drug information centers in total responded forty-six centers, the response rate was 76.66 %. The majority of hospitals 11 (23.9%) with (100-199 beds) and 11 (23.9%) with (200-299 beds). The highest average monthly salary was for the Head of Drug Information Centers (3,160.98 USD) followed by the regular pharmacist (2,909.80 USD) and Clinical Pharmacist (2,823.53 USD). The average daily cost of Drug Information Centers was (537.41 USD) and monthly (16,122.3 USD). The most contribution was personal cost 506 USD (94.26%) Followed by material and supply 14.81 (2.75%) USD and non-salary cost 9.06 USD (1.68%). **Conclusion:** The daily cost of consuming of drug information services is high. The number of services should increase and cost avoidance of clinical activities is required to do periodically.

**Key words:** Cost, Network, Drug Information Services, Ministry of Health, Saudi Arabia.

## INTRODUCTION

The drug information centers network in the Kingdom of Saudi Arabia play a potential role in the answering Healthcare Professional and public inquiries.<sup>[1]</sup> The network participated in the hotline call (937) at Ministry of Health services in the past years.<sup>[1]</sup> They showed high-cost saving per each call. In the study, the author did not calculate the cost of services of drug information because of the participant shred as additional to their daily activities.<sup>[2]</sup> Also, in new Saudi vision implementation and with transformation program required to calculate the cost of services.<sup>[3,4]</sup> That is demand for privatization. Several studies around the world published including Inside Saudi Arabia about cost avoidance of drug information services.<sup>[2,5-10]</sup> However, there is no detail and clarity of cost analysis of Drug Information Services. It seldom to find cost analysis of drug information centers services or foundations in the Kingdom of Saudi Arabia or Gulf and Middle East countries. The objective of the study to explore the cost analysis of drug information centers in Saudi Arabia.

## MATERIALS AND METHODS

### Methods

This is cost simulation of a 2-months cross-sectional survey of all drug information centers at MOH Hospitals. Any drug opened and provided services to health care professionals and the public participated in the questionnaire. All types of drug information centers national or regional

or local at healthcare institutions including in the survey. All type of hospitals or primary care centers included in the survey (public, pediatric, maternity, psychiatry) included in the study. The survey consisted of two parts. Demographics data and consisted of several part questions; Part one: workload of drug information centers, Part two: Cost analysis of Drug Information Centers foundations, Part three: the Cost analysis of drug information activity and Part four: questions about education and training activity of drug information centers. The second one discussed in this study. The cost calculated based on the variable expenses included personal cost, material and supply cost, Fixed expenses including direct cost, non-salary cost and overhead cost.<sup>[11]</sup> All cost used US dollar currency. All calculation done used an electronic Survey monkey system.

## RESULTS

The survey distributed to sixty drug information centers in total responded forty-six centers, the response rate was 76.66 %. The majority of hospitals 11 (23.9%) with (100-199 beds) and 11 (23.9%) with (200-299 beds). The majority of hospitals accredited of Saudi Center for Accreditation of Healthcare Institutions (CBAHI) 27 (58.7%) and Saudi Commission of Health Specialties 9 (19.6%) while 11 (23.9%) hospitals not accredited by any organization. Most of the type of drug information centers were adults drug information center 20 (43.48%) and 15 (32.61%) followed by psychiatric drug information centers 5 (10.87%) and pediatrics drug information centers 4 (8.7%) as explored in Table 1. Among the responders the 43 (95.6%) was

Saudi and 2 (4.4%) was non-Saudi. The age distribution (18-40 years) was high value 44 (95.7%). The most educational level of the responders was Bachelor degree of Pharmacy 22 (47.83%), Doctor of Pharmacy 11 (23.9%) and Master of Science degree 9 (19.57%). Only 4 (10%) has certified Pharmaceuticals specialties. Most of responders 30 (65.2%) were 1-6 years experience with drug information services and 8 (17.39 %) of Clinical Pharmacy experiences as explored in Table 2 and Table 3. The most equipment available in the Drug Information Center was computers 39 (84.78%), the internet 37 (80.43%) and offices 35 (77.77%). While most non-available equipment was the iPad, 41 (89.13%) answering machine 38 (82.6%) and 37 (80.43%) laptop as explored in Table 4. The highest average monthly salary was for the head of Drug Information Centers (3,160.98 USD) followed by the regular Pharmacist (2,909.80 USD) and Clinical Pharmacist (2,823.53 USD) as explored in Table 5. The average daily cost of drug information centers was (537.41 USD) and monthly (16,122.3 USD). The most contribution was personal cost 506 USD (94.26%) Followed by material and supply 14.81 (2.75%) USD and non-salary cost 9.06 USD (1.68%) as explored in Table 6.

**DISCUSSION**

The strategic plan general administration of Pharmaceutical Care at the Ministry of Health in the Kingdom of Saudi Arabia consisted of five strategic goals.<sup>11,12</sup> The fifth goal related to Pharmaco Economic and Health cost-related issues. The cost analysis of drug information centers party of that is one.

**Table 1: Demographic Hospital Information.**

Number of beds at the hospital	Response Count	Response Percent
< 50	7	15.2%
50-99	6	13.0%
100-199	11	23.9%
200-299	11	23.9%
300-399	4	8.7%
400-499	4	8.7%
= or > 600	3	6.5%
Medical City	0	0.0%
Answered question	46	
Skipped question	0	
The hospital accreditation	Response Count	Response Percent
CIBAHl	27	58.7%
Joint Commotion the USA	7	15.2%
Canada	1	2.2%
Saudi commission on health accreditation	9	19.6%
Non-accredited	11	23.9%
Answered question	46	
Skipped question	0	
The type of drug information center	Response Count	Response Percent
General Drug Information Center	15	32.61%
Adult drug information center	20	43.48%
Pediatric drug information center	4	8.70%
Psychiatric drug information center	5	10.87%
Oncology drug information center	0	0.00%
Cardiology drug information center	1	2.17%
Dental drug information center	0	0.00%
Primary health care drug information center	1	2.17%
Answered question	46	
Skipped question	0	

**Table 2: Demographic Responder Qualifications Information.**

Nationality	Response Count	Response Percent
Saudi	43	95.6%
Non- Saudi	2	4.4%
Answered question	45	
Skipped question	1	
Gender	Response Count	Response Percent
18-40 years	44	95.7%
40 - 65 years	2	4.3%
18- 40 years	0	0.0%
more than 65 years	0	0.0%
Answered question	46	
Skipped question	0	
Academic Qualification (s):	Response Count	Response Percent
Diploma Pharmacy	7	15.22%
Bsc. Pharm	22	47.83%
M.S	9	19.57%
Msc. Clinical Pharmacy	6	13.04%
Pharm.D.	11	23.91%
Ph.D	0	0.00%
MBA	3	6.52%
Pharmacy Residency Two years (R1)	1	2.17%
Pharmacy Residency one year (R2)	0	0.00%
Fellowship	1	2.17%
Others	1	2.17%
Answered question	46	
Skipped question	0	
Total years worked as a pharmacist	Response Count	Response Percent
Board Certified Ambulatory Care Pharmacist (BCACP)	0	0.0%
Board Certified Critical Care Pharmacist (BCCCP)	0	0.0%
Board Certified Nuclear Pharmacist (BCNP)	1	2.5%
Board Certified Nutrition Support Pharmacist (BCNSP)	0	0.0%
Board Certified Oncology Pharmacist (BCOP)	0	0.0%
Board Certified Pediatric Pharmacy Specialist (BCPPS)	1	2.5%
Board Certified Pharmacotherapy Specialists (BCPS)	1	2.5%
Board Certified Psychiatric Pharmacist (BCPP)	1	2.5%
Non	39	97.5%
Others	1	2.5%
Answered question	40	
Skipped question	6	

**Table 3: The total years of experience.**

Answer Options	Pharmacy Practice	Clinical Pharmacy	Pharmacy Administration	Drug information services	Response Count
0	2	7	3	3	13
< 1 year	3	5	4	6	16
1-3	8	5	9	14	24
4-6	17	3	7	16	28
> 6 years	23	5	11	8	29
answered question					46
skipped question					0

**Table 4: The total number of equipment for drug information centers.**

Answer options	Equipment not existed	Equipment existed	Response Count	Total number of equipment	Average number of equipment percenter	Cost of equipment per center (USD)	Cost of equipment per center per day (USD)	Response Count mentioned the cost
Place	13	33	46	60	1.82	15641.60	42.85	10
Computer	7	39	46	54	1.38	928.33	2.54	24
Laptop	37	9	46	9	1.00	311.84	0.85	14
iPad	41	5	46	7	1.40	281.15	0.77	9
Offices	10	35	45	42	1.20	1178.24	3.23	20
Landline telephone	12	34	46	49	1.44	316.04	0.87	17
Mobile	31	15	46	28	1.87	634.00	1.74	13
Software of inquiries documentations	21	25	46	39	1.56	984.61	2.70	13
Printer and fax	15	31	46	42	1.35	257.78	0.71	21
Copy machines	21	25	46	26	1.04	474.86	1.30	16
Answering machine	38	8	46	12	1.50	165.00	0.45	8
Internet	9	37	46	52	1.41	439.03	1.20	17
Library	23	23	46	41	1.78	5714.49	15.66	15

**Table 5: The monthly salary of staff for drug information centers.**

Answer Options	total number of staff for drug information centers	Average number of staff per each drug information centers	Response Count	Total salary	Average salary per month	Average salary per day	Average salary per hour USD	Response Count
Head of drug information center	50	1.09	46	129,600.00	3,160.98	143.68	17.96	41
Clinical Pharmacist	24	0.52	46	96,000.00	2,823.53	128.34	16.04	34
Pharmacist	55	1.20	46	98,933.33	2,909.80	132.26	16.53	34
Pharmacy technician	47	1.04	45	70,400.00	2,270.97	103.23	12.90	31
Secretary	6	0.13	45	34,933.33	1,126.88	51.22	6.40	31
Porter	9	0.20	46	35,733.33	1,152.69	52.39	6.55	31

**Table 6: Cost analysis of drug information center foundations.**

Type of cost	Average monthly cost	Average daily cost	Average hourly cost
Personal			
Head of drug information center	3,445.46	156.61	19.58
Clinical Pharmacist	1,468.24	66.74	8.34
Pharmacist	3,491.76	158.72	19.84
Pharmacy technician	2,361.81	107.35	13.42
Secretary	146.49	6.66	0.83
Porter	230.54	10.48	1.31
Over Head cost			
Place	279.60	42.85	1.79
Computer	39.90	2.54	0.11
Laptop	7.80	0.85	0.04
iPad	4.50	0.77	0.03
Landline telephone	9.60	0.87	0.04
Mobile	14.70	1.74	0.07
The software of inquiries documentations	22.80	2.70	0.11
Printer and fax	9.60	0.71	0.03
Copy machines	13.50	1.30	0.05
Answering machine	2.40	0.45	0.02
Material and Supply			
Offices	42.90	3.23	0.13
Non Salary cost			
Education and Training	271.80	9.06	1.13
Direct cost			
Internet	13.20	1.20	0.05
Library	153.30	15.66	0.65
Total	16,122.30	537.41	67.18

Also, the new Saudi vision 2030 and strategic health plan discussed that is matter.<sup>[4]</sup> The author tried to explore the cost of foundation drug information centers services at Ministry of Health in Saudi Arabia. The findings of the study showed that is the primary foundations of drug information centers founded while the advance foundations not available at drug information services because there are precise budgets for Pharmacy departments at each hospital. The head of drug information centers had the highest salary among drug information centers staff because they old in their position and additional bonus got from Ministry of Health. While the lowest salary was a Clinical Pharmacist; because newly employed and they are not specialized or consulting a Clinical Pharmacist. The average daily or monthly cost of drug information centers was high, with most cost came from personal cost because the drug information centers do not use high expense equipment and most of the buildings owned by Ministry of Health. The high percentage of personal cost resemble what reported in the cost of distribution of medication therapy management.<sup>[11]</sup> It was lower than that reported in the other investigations because they used costly equipment in the other pharmacy services.<sup>[13-15]</sup> The other finding is difficult to compare with literature because lacking information data. The cost analysis of drug information services was expensive and a lot of activities, performances and services provided to the healthcare professional and public populations to cover the justification of established the services at Ministry of Health Organization in Kingdom of Saudi Arabia. The study first was done in Gulf and Middle East countries and may utilize with transformation programs in the new Saudi Visions 2030.<sup>[3,16]</sup>

## CONCLUSION

The cost analysis of drug information centers first done at Ministry of Health Hospitals and in the Gulf and Middle East countries. The cost analysis of foundations of Drug Information Services is demanding requirements of the new plan of Ministry of Health and Saudi Vision 2030.

## ACKNOWLEDGEMENT

None.

## CONFLICT OF INTEREST

The authors declare no conflict of interest.

## ABBREVIATIONS

**KSA:** Kingdom of Saudi Arabia; **MOH:** Ministry of Health; **CBAHI:** Saudi Center for Accreditation of Healthcare Institutions.

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