

Cost Efficiency of National Drug Information Center Services Through Ministry of Health Hotline Calling Center (937) in Saudi Arabia

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Abstract

Objective: Since January 2013, the national drug information center (NDIC) has started providing services and since December 2013, it is answering all the public and professional inquiries made through the Ministry of Health (MOH)-Hotline Calling Services (937). Therefore, in this study, we explored the cost avoidance analysis of national drug information inquiries by the hotline services in Saudi Arabia. **Methods:** We simulated the drug information inquiries related to the adults and children for the duration of 12 months of 2014 through MOH-hotline calling services (937). At least 10 on-call clinical pharmacists and expert trained pharmacists were receiving calls made from public and professionals inquiring about drug information. The data were collected in the drug information data collecting form through manual documentation system of drug information inquiries. **Results:** The drug information pharmacist implicated that the high-cost avoidance at the public side came from the dose standardization (30,310 USD (37.5%)) of the total cost avoidance followed by the drug administration and adverse drug reaction (16,532 USD (20.45%) and 9,347.5 USD (11.56%), respectively), which represent more than 50% of the total cost avoidance from the public side. With regard to professional inquiries, the drug information pharmacist implicated that the highest cost avoidance was through inquiries related to drugs in pregnancy, which was around 7,527.50 USD (26%) of the total cost followed by the drug administration, drug-drug interaction and drug identification (4,792 USD (16.5%); 4,141.50 USD (14.3%); and 4,135.50 USD (14.2%), respectively), which represent more than 50% of the total cost avoidance from the professional side. **Conclusion:** NDIC was the first in calculating cost avoidance from answering drug information inquiries from professional and public separately in the Middle Eastern countries. It is highly implicated in the drug information services in the healthcare organization in the Kingdom of Saudi Arabia. **Key words:** Cost, Efficiency, Drug Information Center, Hotline, Ministry of Health, Saudi Arabia.

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INTRODUCTION

The quantity and quality of drug information services (DISs) are dramatically changing including the role of the pharmacists.^[1-2] Until now, several articles have been published on the DISs and on their impact on

other healthcare services and patient care.^[3-5] The DISs must validate their importance and maximize their resources to remain a vital component of the healthcare system. In addition, few cost analysis reports have been conducted on the specialty of drug information.^[3,5-9] A search on MEDLINE and other databases on

the impact of cost on DISs until 2017 using keywords such as “drug information,” “cost,” “economics” or “pharmacist” revealed only two articles. These articles have focused their research on the cost avoidance and calculation of DISs, economic impact services^[7] and cost saving associated with a dedicated DIS in an Academic Medical Center (Jemie N Brown).^[9] In previous research conducted in the Hospital of the University of Pennsylvania, drug information responses with Six weeks interval and used the same model, the cost saving during the study interval was 195,000 USD projected to 1-year potential cost savings reached 1.7 million USD. The estimated cost avoidance per call was 342 USD.^[7] Another study conducted cost analysis based on the cost of the staff’s salary and the time spent on each question with cost calculation of intervention based on the drug information model and severity rating.^[9] Durham Veteran’s Affairs Medical Center in North Carolina had their cost saving calculated for all the interventions. By doing so, they saved a cost of 157,483 USD for 1 year’s research and a total of 186 responses for 1 year. The estimated cost avoidance per call was 846,682 USD. The cost avoidance calculated by total time spent in research by each profession, reached to a total of 2080 hours of work per year. The center had appointed a pharmacist, a family practice physician, a registered nurse, a physician assistant and nurse practitioners with an average hourly wage of 44.59 USD, 91.08 USD, 30.78 USD, 34.82 USD and 42.52 USD, respectively. The inquiries from public accounted for 1% by the healthcare provider; therefore, the cost avoidance cannot be calculated, whereas in Durham Veteran’s Affairs Medical Center in North Carolina, the inquiries accounted for 49% based on the estimation of hourly work done per year for each profession. In the Hospital of the University of Pennsylvania, it was 17.7% which by used the same model of cost saving.^[9] To the best of our knowledge, there are no studies performed to investigate the economic impact of DISs in Saudi Arabia, Gulf, or Middle Eastern countries. Therefore, in this study, we aimed to explore the cost avoidance of national drug information center at Ministry of Health in the Kingdom of Saudi Arabia.

METHODS

We simulated the drug information inquiries for all 12 months of 2014 related to adults and children through MOH-hotline calling services (937). There were 10 on-call clinical pharmacists and expert trained pharmacists to receive calls from the public and professionals inquiring about drug information. The data

were collected in the drug information data collecting form through electronic documentation system of drug information inquiries. The cost avoidance calculations were performed through Survey Monkey system. All documented calls received by 937 hotline services from January 2013 to December 2014 were analyzed and the pharmacist used drug information inquiries to calculate cost avoidance per question based on the American model.^[7] Then, the total number of calls, excluding all poisoning calls, were included for the calculation. Any calls that were not documented were also excluded in this study.

RESULTS

A total of 1479 calls were received during the 12-month study period. Several drug information calls (976 (67.13%)) and poisoning calls (17 (1%)) were answered; there were 421 (28.46%) missed calls and 65 (4.49%) closed calls. Of all the responded calls, only 264 (27%) calls including a total of 300 inquiries were documented. The estimated total cost with complete documentation was found to be 405,801 USD per year. The average cost avoidance per call was found to be 415.78 USD and total cost avoidance was found to be 109,768 USD with incomplete documentation. The cost avoidance of answering public inquiries was found to be 80,806.5 USD and the cost avoidance due to professional inquiries were found to be 28,961.5 USD. Drug information pharmacist implicated that the highest cost avoidance on the public side was from dose standardization (30,310 USD (37.5%) of the total cost avoidance) followed by drug administration and adverse drug reaction (16,532 USD (20.45%) and 9,347.5

Table 1: Cost avoidance of public inquiries.

Inquiry classification type of inquiries by public	Cost avoidance (USD)
Dose standardization	30,310
Drug Administration	16,532
ADR	9,347.5
Drug in pregnancy	8,298.5
Drug availability/ formulary	6,810
Others	3,972.5
Compatibility	2,598
Drug Identification	1,550.5
Drug-drug interaction	838
Drug- Nutrition interaction	291.5
Drugs in breast feeding	129
pharmacokinetic	64.50
Compounding	64.50
Total	80,806.5

Table 2: Percentage of inquiry classification for public and professional side.

Inquiry classification	Public and Professional Cost Avoidance %	Public Cost Avoidance %	Professional Cost Avoidance %
Dose standardization	27	27.77	25.83
Drug Administration	15.33	16.11	14.16
Drug in pregnancy	7.66	12.7	8.33
ADR	11.66	9.47	15
Drug availability/ formulary	9.66	9.4	5
Drug Identification	10	7.22	9.16
Drug-drug interaction	7.33	6.66	10.83
Others	6	5	5
Compatibility	1	1.66	1.66
Drugs in breast feeding	2	1.11	2.5
Compounding	1.33	0.55	2.5
Drug- Nutrition interaction	0.66	0.55	0
pharmacokinetic	0.33	0.55	0
Total	100	100	100

Table 3: Cost avoidance of healthcare professional inquiries.

Type of inquiries by professional	Cost avoidance (USD)
Drug in pregnancy	7,527.50
Drug Administration	4,792
Drug-drug interaction	4,141.50
Drug Identification	4,135.50
Dose standardization	3,885
ADR	3,445.50
Drugs in breast feeding	356
Compounding	291.5
Others	258
Compatibility	64.50
Drug availability/ formulary	64.50
Drug- Nutrition interaction	0
Pharmacokinetic	0
Total	28,961.5

USD (11.56%), respectively) which represent more than 50% of the total cost avoidance from the public side (Tables 1 and 2). However, with respect to the professional inquiries, the drug information pharmacist implicated that the highest cost avoidance was through inquiries related to drugs used in pregnancy (7,527.50 USD (26%) of the total cost), followed by the drug administration, drug–drug interaction and drug identification (4,792 USD (16.5%); 4,141.50 USD (14.3%); and 4,135.50 USD (14.2%), respectively), which represent more than 50% of the total cost avoidance from the professional side (Table 3).

DISCUSSION

The general administration of pharmaceutical care

established the national drug information center in early 2013.^[1] It provided services to the professionals and public regarding medications. In late 2013, the national drug information center participated with hotline call (937) to answer the professional and public drug information inquiries until this time. During the first year, all pharmacists documented the calls received in electronic format through Survey Monkey system through internet. All required documentation, in addition to the documentation of cost avoidance from answering the inquiries, was based on the guidelines of the American Society of Health-System Pharmacists.^[2] The author analyzed all the related results. During the 12-month period, the total cost was found to be high with few drug information inquiries, which is related to the high impact of prevention of drug-related problems. The average cost avoidance per call was found to be high, which is because of the importance of questions and weak background knowledge in the professional and public side. The estimated cost avoidance in this study was found to be almost similar to those reported by Kinky et al., but it differs from other investigations due to difference in the method of cost calculation.^[5,7,9] The cost avoidance was found to be more from the public side than that of healthcare professionals' side, which is related to the number and quality of drug information inquiries. The highest cost avoidance from the drug information inquiries from the public side was from drug standardization, drug administration and adverse drug reaction and represented almost half of the total cost avoidance. This reflects the weak background and knowledge regarding drugs at the public side. Moreover, the patient medications counseling was not widely implemented at the Ministry

of Health hospitals. The highest cost avoidance from the professional side was pregnancy and lactation, drug administration and drug–drug interaction, in addition to drug identification. Therefore, that is tied no available freely drug information resources with them or the physician not familiar with drug information resources with additional demanding of knowledge of those type drug information inquiries. Our results could not be compared with those from the literature due to lack of information. A previous study focused their research on the potential of national drug information centers to answer inquiries from the healthcare professional and public side. The drug information services were in great demand for both national or regional hospital. Furthermore, educational sessions to train the professionals or the public is necessary to avoid any additional cost, including patients counseling program, at all healthcare organizations at the Ministry of Health in the Kingdom of Saudi Arabia.

CONCLUSION

To the best of our knowledge, this is the first article to address cost avoidance classified by drug information inquiry for both public and healthcare providers; this shows the importance of having drug information in each hospital and the economic impact in just serving one task of DISs. This also sheds some light on how necessary and crucial is the documentation for each function as it does not only justify the services to get more support but also to monitor and improve it.

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CONFLICT OF INTEREST

None.

ABBREVIATIONS

NDIC: National Drug Information Center; **DISs:** Drug Information Services; **KSA:** Kingdom of Saudi Arabia; **MOH:** Ministry of Health; **ASHP:** American Society of Health-System Pharmacists.

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