

RESEARCH ARTICLE

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National Analysis of Network Drug Information Centers: Education, Training and Related Cost at Ministry of Health Hospitals in Saudi Arabia

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Abstract

Objectives: To explore analysis of network Drug Information Education and training services with the related cost at Ministry of Health (MOH) institutions. **Methods:** This is a 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, 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 questions about education and training activity of drug information centers. It included education and training programs and activities for pharmacy staff and healthcare professional and training services for pharmacy student, pharmacy technician students and pharmacy residency programs with related cost analysis. All analysis done by using an electronic Survey Monkey system. **Results:** The survey distributed to sixty drug information centers with the total responded forty-six center, the response rate was 76.66 %. The majority of hospitals 11 (23.9%) with (100-199) and 11 (23.9%) with (200-299 beds). In the pharmacy training programs, the highest workload and cost implicated was Pharm. D or Master Pharmacist on job training programs (1.34 FTE) with average daily cost was (170.12 USD). The highest daily workload and cost of education and training activities delivered to the healthcare professional was short education courses 1-5 days (0.72 FTE) with average daily cost was (91.53 USD). The highest daily workload and cost of education and training activities delivered by Drug Information Centers to Pharmacy staff was specialized Pharmacist Residency Program needed (6.56 FTE) with average daily cost was (832.13 USD). The highest workload and cost of education and training activities of drug information staff was specialized Pharmacist Residency Program needed (3.42 FTE) with average daily cost was (433.89 USD). **Conclusion:** One-third of the network drug information centers had education and training services despite the deficiency of the staff. Targeting of expanding the training services are highly recommended to cover the demand for hospital services.

Key words: Network, Drug Information centers, Education, Training, Cost, Ministry of Health, Saudi Arabia.

INTRODUCTION

The Pharmacy Education and Training is a potential element in the Pharmacy Practice. It required as minimum standards of hospital pharmacy, the ambulatory care services and drug information services.^[1-3] In addition to all Pharmaceutical services. The drug information centers provide several education and training sessions and programs. Those education and training services provided to the drug information centers staff, pharmacy staff and healthcare professional. The workload analysis and cost-related issues are required to fit with Saudi vision 2030.^[4-5] Several published distrusted about drug information related cost avoidance.^[6-12] However, it challenging to find the workload analysis and workforce required investigation around the world. In addition to cost analysis of education and training activities of drug information centers. The objective is to explore the workload and cost analysis for education and training services of network drug information centers in Kingdom of Saudi Arabia (KSA).

MATERIALS AND METHODS

Methods

It is a simulation including 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 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 third one discussed in this study. It included education and training programs and activities for pharmacy

staff and healthcare professional and training services for pharmacy student, pharmacy technician students and pharmacy residency programs with related cost analysis. All analysis was done by using an electronic Survey Monkey system.

RESULTS

The survey distributed to sixty drug information centers with the total responded forty-six center, 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 centers 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. In the pharmacy training programs, the

highest workload and cost implicated was Pharm. D or Master pharmacist on job training programs (1.34 FTE) with average daily cost was (170.12 USD). Followed by Pharm. D or Master Student pharmacist-training program (1.18 FTE) with average daily cost was (149.32 USD) and Pharmacist Residency Program (1.07 FTE) with average daily cost (135.86 USD) as explored in Table 4. The highest daily workload and cost of education and training activities delivered to the healthcare professional was short education courses

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
CIBAHI	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: 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: Workload and cost of Pharmacy training programs.

Type of training programs	The number of monthly trainees per each program					The time spent for each trainee daily for each program						Full time employee (FTE)	The average cost of activities USD
	There no trainees existed	There are trainees existed	Response Count	Total Number of trainees	Average number of trainees percenter	There no trainees existed	There are trainees existed	Response Count	Total Number of hours	Average hours percenter	Average time needed per trainees daily		
Pharmacy Technician students Training Program	26	19	45	54	2.84	20	26	46	75.25	2.89	8.23	1.03	130.38
Pharmacy Technician on Job training Program	19	23	42	67	2.91	20	24	44	58.75	2.45	7.13	0.89	113.02
Pharmacist Student Training Program	22	22	44	66	3.00	20	24	44	62.25	2.59	7.78	0.97	123.33
Pharmacist on Job Training Program	19	24	43	65	2.71	19	24	43	50.25	2.09	5.67	0.71	89.88
Pharmacist Residency Program	40	3	43	16	5.33	37	7	44	11.25	1.61	8.57	1.07	135.86
Pharm D OR Master Pharmacist Student Training Program	33	10	43	38	3.80	32	12	44	29.75	2.48	9.42	1.18	149.32
Pharm D OR Master Pharmacist on Job Training Program	37	6	43	16	2.67	34	10	44	40.25	4.03	10.73	1.34	170.12
Pharm D OR Master Residency Program	38	5	43	11	2.20	37	7	44	22.25	3.18	6.99	0.87	110.84

1-5 days (0.72 FTE) with average daily cost was (91.53 USD). Followed by long reading session 4-5 weeks needed (0.61 FTE) with average daily cost was (76.83 USD) and weekly continuous medical education lecture needed (0.37 FTE) with average daily cost (47.32 USD) as explored in Table 5. The highest daily workload and cost of education and training activities delivered by Drug Information Centers to pharmacy staff was specialized pharmacist residency program needed (6.56 FTE) with average daily cost was (832.13 USD). Followed by long training session needed (1.05 FTE) with average daily cost was (133.71 USD) and general pharmacist residency program required (0.91 FTE) with average daily cost (115.57 USD) as explored in Table 6. The highest workload and cost of education and training activities of drug information staff was specialized pharmacist residency program needed (3.42 FTE) with average daily cost was (433.89 USD). Followed by conferences and symposium outside the Kingdom of Saudi Arabia needed (2.31 FTE) with average daily cost was (293.06 USD) and workshop outside the Kingdom of Saudi Arabia demanding (1.53 FTE) with average daily cost was (193.72 USD) as explored in Table 7.

DISCUSSION

The third pharmacy strategic goal at Ministry of Health organizations was related Pharmacy Human Resources and related issues.^[13] The general administration of Pharmaceutical Care conducted several educational sessions related to Pharmacy Practice and Clinical Pharmacy and the Drug Information Services were part of them.^[13] However, the workload of education and training activities and cost related not known. The author tried to explore the workload analysis of drug information centers and cost related to Ministry of Health in Kingdom of Saudi Arabia. The overall average of existing drug information education and training program was one-third of the subjects. That is results lower than what reported by Rosenberg, JM *et al.* That is related to the new network of drug information services at Ministry of Health.^[14-15] The results showed the highest workload education and training in drug information services was a pharmacist on job training and pharmacy student training program because it will more time and subsequently, the cost related. The highest workload and cost of education and training programs delivered to healthcare professional was short or long course and weekly lecture. Although short courses or weekly lecture is a short time, the more frequently

Table 5: Workload and cost of drug information center deliver the Education and Training to Healthcare professional staff.

Type of events	The frequency of drug information center delivers the Education and Training to Healthcare professional staff monthly					Time consumed by drug information center to deliver the Education and Training to Healthcare professional staff daily.							
	There no education or training existed	There is education or training existed	Response Count	Total Number of events	Average number of events percenter	There are not trainees existed	There are trainees existed	Response Count	Total Number of hours	Average hours percenter	Average time needed per event	Full time employee (FTE)	The average cost of activities USD
Weekly lecture CME	22	22	44	68	3.09	22	22	44	21.25	0.97	2.99	0.37	47.32
Short education course 1-5 days	22	20	42	42	2.10	21	19	40	52.25	2.75	5.78	0.72	91.53
Long training session 4-5 weeks	31	11	42	23	2.09	30	11	41	25.5	2.32	4.85	0.61	76.83
Orientation program	18	24	42	37	1.54	24	18	42	21.25	1.18	1.82	0.23	28.85
Basic Medication Safety	15	26	41	64	2.46	18	24	42	26.5	1.10	2.72	0.34	43.08
Cardiopulmonary Resuscitation Medications	24	17	41	31	1.82	23	18	41	29	1.61	2.94	0.37	46.57
Intravenous Medications	25	17	42	44	2.59	24	17	41	15.75	0.93	2.40	0.30	38.01
Emergency Medications	21	21	42	43	2.05	22	19	41	25.25	1.33	2.72	0.34	43.13
Distance learning CME education by pharmacy	31	10	41	21	2.10	26	14	40	16.75	1.20	2.51	0.31	39.82

Table 6: Workload and cost of drug information center deliver the Education and Training to pharmacy staff.

Type of events	The frequency of drug information center deliver Pharmacy Education and Training staff monthly					time is consumed by drug information to deliver Pharmacy Education and Training staff daily						Full time employee (FTE)	The average cost of activities USD
	There no education or training existed	There is education or training existed	Response Count	Total Number of events	Average number of events percenter	There no trainees existed	There are trainees existed	Response Count	Total Number of hours	Average hours percenter	Average time needed per each event		
Weekly lecture CME	17	26	43	68	2.62	21	23	44	34.75	1.51	3.95	0.49	62.63
Short education course 1-5 days	23	19	42	34	1.79	20	22	42	60.5	2.75	4.92	0.62	78.00
Long training session 4-5 weeks	28	13	41	28	2.15	26	15	41	58.75	3.92	8.44	1.05	133.71
General Pharmacist residency program	36	6	42	15	2.50	35	6	41	17.5	2.92	7.29	0.91	115.57
Specialized pharmacist residency program	40	2	42	15	7.50	38	3	41	21	7.00	52.50	6.56	832.13
Distance learning pharmacy education	33	9	42	16	1.78	30	11	41	24.25	2.20	3.92	0.49	62.12

Table 7: Workload and cost of Internal Education and Training for drug information center staff.

Type of events	The frequency of drug information center staff Share at Education and Training monthly					drug information staff share consumes the time at Education and Training staff daily					Full time employee (FTE)	The average cost of activities USD	
	There no education or training existed	There is education or training existed	Response Count	Total Number of events	Average number of events percenter	There no trainees existed	There are trainees existed	Response Count	Total Number of hours	Average hours percenter			Average time needed per event
Weekly lecture CME	17	25	42	58	2.32	19	23	42	27.25	1.18	2.75	0.34	43.57
Short education course 1-5 days	20	23	43	48	2.09	17	23	40	57.25	2.49	5.19	0.65	82.34
Long training session 4-5 weeks	24	17	41	38	2.24	23	15	38	40.25	2.68	6.00	0.75	95.07
General Pharmacist residency program	38	3	41	21	7.00	35	4	39	10.25	2.56	17.94	2.24	284.31
Specialized pharmacist residency program	38	4	42	18	4.50	36	3	39	18.25	6.08	27.38	3.42	433.89
Distance learning pharmacy education	27	15	42	35	2.33	29	10	39	17.25	1.73	4.03	0.50	63.80
Conference and Symposium inside KSA	15	25	40	65	2.60	17	22	39	83.25	3.78	9.84	1.23	155.94
Conference and Symposium outside KSA	31	10	41	31	3.10	32	7	39	41.75	5.96	18.49	2.31	293.06
Workshop inside KSA	15	25	40	66	2.64	18	21	39	87.5	4.17	11.00	1.38	174.35
Workshop outside KSA	33	9	42	30	3.33	33	6	39	22	3.67	12.22	1.53	193.72

than the long course. All them the drug information pharmacist spent more time and cost by them. While the workload of education and training activities delivered to pharmacy staff was residency program or long-term session and this was normal because more of pharmacist got training rather than courses or lecture, so the drug information pharmacist spent more time and cost related with those type of training and education. The highest workload of training or education delivered to pharmacy staff was specialized residency or education as conferences inside or outside Saudi Arabia. That is finding expected because most of drug information pharmacist need specialized residency or participation in the conferences. That has were not received shout courses or long course much or weekly lectures. All previous results were hard to compare them because of insufficiently published literature. The study explored all workload and related cost training or education services delivered by drug information services. It very useful during utilized them by other hospitals or organizations and fit by Saudi Vision 2030 or Ministry of Health with privatization.^[4-5]

CONCLUSION

The training and education services of network drug information centers were reasonably cost. Targeting to expand the services will increase pharmacy revenue and fit with Saudi Vision 2030 and new healthcare at Ministry of Health organizations during the privatization.

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None.

CONFLICT OF INTEREST

None.

ABBREVIATIONS

KSA: Kingdom of Saudi Arabia; **MOH:** Ministry of Health.

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