Pharmacy Workload and Workforce Requirements at MOH Primary Health Care Center during Ten years Mass Gathering Hajj (2006-2015) in Makah Region, Saudi Arabia

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Abstract

Purpose: To explore the pharmaceutical care workload analysis and workforce requirements at Ministry of Health Primary health care centers during mass gathering Hajj ten years (2006-2015), Saudi Arabia. **Methods:** It is a retrospective study of ten years (2006-2015) in primary health care center (PCC) about pharmacies workload during mass gathering Hajj period. The duration of workload collection was 15 days. The pharmacist and pharmacy technicians provide pharmaceutical care to all patients either Pilgrim or not Pilgrim at Makah region. It included Mona holy places hospitals; Arafat holy places hospitals, and Makah city. The workforce requirements calculated based on MOH workforce standards of primary health care center and the workload drives as central pharmacy services, patient specific pharmacy activities, and general administration specific pharmacy activities. **Results:** The total number of pilgrims (1,952,817-3,161,573) with average (2,445,208). The average number PCC prescription at holy places were (275,820) and (138,388.4) from Makah city. The average number of pharmacist needed (24.92 FTE) per each PCC at holy places, and (27.97 FTE) per each PCC at Makah city. The average number of pharmacist based on MOH standards at Makkah region PCC was (678.50 FTE) while the mean number pharmacist needed based on workload was (3,451.72 FTE) at Makkah region. It is (5.17 fold) more incremental than MOH pharmacist workforce standards. **Conclusion:** The pharmacy workload analysis at primary health care center reflected the real demand for pharmacists. Clinical pharmacy activities at PCC missed with emphasis on patient-specific clinical pharmacy. Targeting to change pharmacy workforces improves pharmacy services provided to all pilgrims in Makkah region, Saudi Arabia.

Key word: Pharmaceutical Care, Workload, Workforces, Primary Care Center, Mass Gathering, Hajj, Makkah.

INTRODUCTION

Hajj is an annual religious gathering (Islamic pilgrimage) that occurs every year in Makah, Saudi Arabia. Attracting more than 2 million Muslims annually, making it one of the most significant mass gatherings in the world. It is a great example that

could be studied by researchers (especially because of its repetitiveness every year) to assess the needs for such events to help to organize and improving services in all mass gathering that may occur.^[1] Some health problems may take place during Hajj because of crowding, heat, behavior and general health of peoples. So that, World Health Organization and other authorities pay special attention to these gatherings and developing guidelines, especially for controlling communicable diseases due to their risk for individuals and their home countries when they return. However, all types of diseases are common during Hajj or other mass gatherings, and they are not limited to communicable (infectious) diseases as several studies declared it.^[2-4]

Despite the type of illness and the individual's health, almost all patients require one of the important aspects of health care system, the pharmaceutical care. The interventions of clinical pharmacists in mass gathering medicine are of paramount importance that not adequately discussed in the literature. Several studies were done to assess mass gathering medicine, the patterns of diseases, and vaccination effectiveness during hajj, but Alomi *et al.*, the first studied the national mass gathering pharmaceutical care in Saudi Arabia in 2016.^[4-8] After very extensive literature review and only limited number of studies discussed utilized physician and nurses during mass gathering events but not pharmacists with the emphasis of primary care centers.^[9-11] Most of the patients during hajj prefer primary health care centers to hospitals because they are of higher abundance and easier to reach. Also, the patients during hajj prefer fast services due to their tight schedule. The author not familiar with published studies discussed primary care center pharmacy workforces during mass gathering meeting or even during Hajj period in Saudi Arabia or Gulf countries and the Middle East countries. In addition to worldwide countries. Because of that, the authors have concentrated on our study on pharmaceutical care during mass gathering; Hajj, and the workload and workforce requirements of pharmacists during this period in Makkah region primary health care centers in particular.

METHODS

It is a retrospective analysis of ten years (2006-2015) of primary healthcare center (PCC) pharmacies workload during mass gathering Hajj period. The duration of workload collection was 15 days. The primary healthcare is the first and the easiest level the patient could reach if they have any health problem. All the data derived from Ministry of Health. Health Statistical Year Books.^[12-21] At

primary healthcare centers, the patient will receive safe and fast health services such as; medical examination, some blood analysis, and patient follow-up. The patients also will receive their medications with proper counseling and education.^[22] There are about 158 primary care centers in Makah region; 46 in Makah city and 112 in holy places (Mina and Arafat). The pharmacist and pharmacy technicians provide pharmaceuticals to all patients (Pilgrim or not Pilgrim). The clinical pharmacist at primary care centers may work in; administrative affairs unit, total quality unit, medical supply unit, medication safety unit, clinical pharmacy unit, and pharmacy unit. The pharmacists there manage patients with acute and chronic common illnesses and provide sufficient care for patients who do not need a hospital.^[22] Also, there was extensive literature review search at open date periods with fifty databases. It included the type of studies (meta-analysis, randomized controlled studies, and observational studies, books, reports...etc) in the English language. The search for the term of Hajj and workforce, Hajj and workforce, Hajj and human resources or mass gathering and workforce, mass gathering and workforce, mass gathering and human resources. The search term was in the title and keywords. All setting of patient care services; hospitals inpatient or ambulatory care or community services included. The search included pharmacist and clinical pharmacist. Pharmacy technician excluded from the study. The location of studies included Saudi Arabia as top propriety if not existed Gulf or Middle East countries included, and if not found overall countries included. The workforce requirements calculated based on MOH workforce standards of primary health care center and the workload drives as central pharmacy services, patient-specific pharmacy activities, and general administration specific pharmacy activities.^[23-26] The workload calculation based on pharmacy administration database in Makkah region with considered that is an average time of pharmacist dispensing PCC prescription was 4 min and the mean number of medication per each prescription was three. All calculation done used Microsoft Excel version ten.

RESULTS

The total number of pilgrims was (1,952,817-3,161,573) with average (2,445,208). The total number of prescriptions (226,824-505,753) with average (411,317), it represented (7.12-20.25%) with average (16.77%) of all pilgrims. The number of primary care centers in Makah was (36 – 46) with an average of (41.7), while in holy places there was (80 – 112) with a mean of (4.9) Primary Care Centers as explored Table 1. The average number PCC prescription

Table 1: Number of Pilgrims, Primary care centers (PCC) at Makkah city and Holy places over ten years in Makkah region

Year	Pilgrims number	Makah City		Holy Places	
		No of PCC	No of PCC	Total PCC	No of Pilgrims / PCC
2006	2,378,636	36	89	125	19,029.09
2007	2,454,325	40	80	120	20,452.71
2008	2,408,849	38	80	118	20,413.97
2009	2,313,278	42	99	141	16,406.23
2010	2,789,399	43	96	139	20,067.62
2011	2,927,717	43	96	139	21,062.71
2012	3,161,573	43	96	139	22,745.13
2013	1,980,249	43	96	139	14,246.40
2014	2,085,238	43	96	139	15,001.71
2015	1,952,817	46	112	158	12,359.60
Average	2,445,208.10	41.70	94.00	135.70	18,178.52

Table 2: Number of Primary care center (PCC) prescriptions at Makkah city and Holy places over ten years in Makkah region

Y (H)	Y (G)	Makah city		Holy Places			Total No of PCC Prescriptions	Percentage of prescriptions from Pilgrims (%)	Total No of PCC Prescriptions/ day
		No of PCC Prescriptions	Percentage of prescriptions from Pilgrims (%)	No of PCC Prescriptions/ day	No of PCC Prescriptions	Percentage of prescription from Pilgrims (%)			
1427	2006	146,821	6.17	9,788.07	287,383	12.08	19,158.87	18.25	28,946.93
1428	2007	156,338	6.37	10,422.53	287,756	11.72	19,183.73	18.09	29,606.27
1429	2008	165,105	6.85	11,007.00	319,633	13.27	21,308.87	20.12	32,315.87
1430	2009	167,336	7.23	11,155.73	301,127	13.02	20,075.13	20.25	31,230.87
1431	2010	155,333	5.57	10,355.53	321,053	11.51	21,403.53	17.08	31,759.07
1432	2011	148,065	5.06	9,871.00	286,057	9.77	19,070.47	14.83	28,941.47
1433	2012	164,333	5.20	10,955.53	341,420	10.80	22,761.33	16.00	33,716.87
1434	2013	101,158	5.11	6,743.87	244,484	12.35	16,298.93	17.45	23,042.80
1435	2014	77,733	3.73	5,182.20	215,210	10.32	14,347.33	14.05	19,529.53
1436	2015	101,662	5.21	6,777.47	154,077	7.89	10,271.80	13.10	17,049.27
Average		138,388.40	5.65	9,225.89	275,820.00	11.27	18,388.00	16.92	27,613.89

at holy places were (275,820) and (138,388.4) from Makkah city. The average number of PCC order at sacred sites was (9,225.89) per day and contained (27,677.67) medications, while at PCC in Makkah city was (18,388) prescriptions per day and contained (55,164) drugs as explored Table 2. The average number of pharmacist needed (24.92 FTE) per each PCC at holy places, and (27.97 FTE) per each PCC at Makkah city. The average number of pharmacist based on MOH standards at Makkah region PCC was (678.50 FTE) while the mean number pharmacist needed based on workload was (3,451.72 FTE) at Makkah region. It is (5.17 fold) more incremental than MOH pharmacist workforce standards as explored Table 3 and Table 4. There were no any central pharmacy activities, and clinical pharmacy services or administrative pharmacy activities.

DISCUSSION

The primary healthcare services had developed and expanded several times in the ten years.^[21] The Ministry of Health established special part of primary care centers (PCCs) among healthcare strategic plan 2010-2020.^[27] The general administration of pharmaceutical care released the pharmacy primary healthcare workforces in 2014 and established pharmacist primary healthcare competency for various specialties of primary care services.^[3-22] Also, they formulated primary healthcare committee with a membership of several primary care pharmacist from the different center in Riyadh city to implement several pharmacy practices and clinical pharmacy services. Also, the first publication of patient satisfaction of Pharmaceutical Care in a primary care center in Saudi Arabia and Middle East countries through the MOH pharmacy administration.^[28] Furthermore, pharmacy primary care skeleton updated and implemented in past years. It consisted of several units including Ambulatory care pharmacy, medication safety. Pharmacy total quality management, and drug information center.^[23] All previous successful plans covered all primary healthcare centers including Makkah city and holy places. The authors did the study to evaluate the new guidelines of workforces and compare with workload analysis by using dispensed prescriptions during mass gathering Hajj period. The number of PCCs has increased dramatically in the last years, if we look at the number of prescriptions in PCC through years, we will notice much decrease in the last years compares with the past. It may be due to the reduction in health problems during Hajj because of health awareness and vaccination. The findings showed the high demand of primary care pharmacist more than MOH standards with five times fold during mass gathering Hajj period if compared to study conducted in Saudi Arabia in

Y (H)	Y (G)	Pilgrims number	Makkah city		Holy Places		Total Makka region	
			No of PCC Prescriptions	FTE	No of PCC Prescriptions	FTE	Total No of PCC Prescriptions	Total FTE
1427	2006	2,378,636	146,821	33.99	287,383	26.91	434,204	60.90
1428	2007	2,454,325	156,338	32.57	287,756	29.97	444,094	62.54
1429	2008	2,408,849	165,105	36.21	319,633	33.3	484,738	69.51
1430	2009	2,313,278	167,336	33.20	301,127	25.35	468,463	58.55
1431	2010	2,789,399	155,333	30.10	321,053	27.87	476,386	57.97
1432	2011	2,927,717	148,065	28.69	286,057	24.83	434,122	53.52
1433	2012	3,161,573	164,333	31.85	341,420	29.64	505,753	61.49
1434	2013	1,980,249	101,158	19.60	244,484	21.22	345,642	40.82
1435	2014	2,085,238	77,733	15.06	215,210	18.68	292,943	33.74
1436	2015	1,952,817	101,662	18.42	154,077	11.46	255,739	29.88
Average		2,445,208.10	138,388.40	27.97	275,820.00	24.92	414,208.40	52.89

Table 4: Number of calculated Full-Time Employee based on workload of Primary care centers (PCC) services prescriptions at Makkah city and Holy places over ten years in Makkah region									
Year	Makah City			Holy Places			Total No of pharmacist (MOH Standards)	Total No of pharmacist (Workload)	No of fold times
	No of PCC	No of pharmacist (MOH Standards)	No of pharmacist (Workload)	No of PCC	No of pharmacist (MOH Standards)	No of pharmacist (Workload)			
2006	36	180	1,223.64	89	445	2,394.99	625	3,618.63	5.79
2007	40	200	1,302.80	80	400	2,397.60	600	3,700.40	6.17
2008	38	190	1,375.98	80	400	2,664.00	590	4,039.98	6.85
2009	42	210	1,394.40	99	495	2,509.65	705	3,904.05	5.54
2010	43	215	1,294.30	96	480	2,675.52	695	3,969.82	5.71
2011	43	215	1,233.67	96	480	2,383.68	695	3,617.35	5.20
2012	43	215	1,369.55	96	480	2,845.44	695	4,214.99	6.06
2013	43	215	842.8	96	480	2,037.12	695	2,879.92	4.14
2014	43	215	647.58	96	480	1,793.28	695	2,440.86	3.51
2015	46	230	847.18	112	560	1,283.98	790	2,131.16	2.70
Average	41.70	208.50	1,153.19	94.00	470.00	2,298.53	678.50	3,451.72	5.17

2014 that make the standards of the number of pharmacy staff in a primary care center.^[23] Another study shows that we need one pharmacist for each 10,000 population.^[29] The limitation of comparing the results of these studies was in the population; these studies were studying normal PCCs with a normal number of patients, despite our study, which studies PCCs in mass gathering event. There is no study in the overall the world study to compare with results. It seems to the first investigations about workforces of primary care pharmacist during mass gathering Hajj period. These results reflect the real needs of pharmacists during Hajj period and the shortage present in pharmacy staff. The authors excluded the pharmacy technician and clinical pharmacist with another study in the future investigated.

Limitation

Despite the importance of the study, finding the study had several limitations and the author could not control them. The missing of official through MOH or general administration of pharmaceutical care the documentation of the number of pharmacist or pharmacist activities at PCC. Also, the number and type of medication dispensed through PCCs missed.

CONCLUSION

The primary health care centers had very high demanding of a pharmacist during mass gathering Hajj period in Makkah region, Saudi Arabia. Targeting to change MOH pharmacy workforces requirement by the increased number of pharmacist staff during mass gathering Hajj time, and an electronic documentation of prescriptions and pharmacy activities. That would reflect actual of pharmacy workforces and improve pharmaceutical care services offered to all pilgrims during mass gathering Hajj time visit Makkah region in Saudi Arabia.

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CONFLICT OF INTEREST

None

ABBREVIATION USED

KSA: Kingdom of Saudi Arabia, MOH: Ministry of Health,

PCC: Primary care center.

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