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RESEARCH ARTICLE

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Clinical Pharmacy Technician and Human Resources Requirements at MOH Primary Healthcare Centers during Ten years Mass Gathering Hajj (2006-2015) in Makah and Al-Medina Regions, Saudi Arabia

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Abstract

Objective: To explore the clinical pharmacy technician services and workforce requirements at Ministry of Health primary health care centers during mass gathering Hajj ten years (2006-2015) at Makah and Al-Medina Regions in Saudi Arabia. **Methods:** It is a retrospective analysis of ten years (2006-2015) of MOH primary health care centers (PCC) pharmacies during mass gathering Hajj period (15-30 days). The clinical pharmacy technician helps the clinical pharmacist to provide pharmaceutical 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 hospitals. The clinical activities drive from MOH critical care services, emergency services, and mortality rate data. The nine clinical pharmacy services characterized by reduction mortality cost saving and mass gathering demand chosen. American College of Clinical Pharmacy (ACCP) modified the model of clinical activities used. **Results:** The total number of Pilgrims was (1,952,817-3,161,573) with average (2,445,208). The average number of clinical pharmacy technician needed in Makka region was (67.85 FTE) divided into (47 FTE) at holy places Primary Care Centers, while (20.85 FTE) at primary care centers in Makah city. Also, the number of clinical pharmacy technician need (6.67 FTE) at primary care centers at Al-Medina Region. The total number of clinical pharmacy technician needed per 10,000 population was (122.26 FTE) in Makka region while (97.64FTE) in Al-Madina region. **Conclusion:** There is a much demand of clinical pharmacy technician at primary care centers during mass gathering Hajj period in Makka and Al-Madina regions. The clinical pharmacy technician in plays very vital for supporting the clinical pharmacist role in public society especially chronic illness with emphasis mass gathering of reducing morbidity and mortality.

Keyword: Clinical pharmacy technician, Primary care center, Workload, Workforces, Mass Gathering, Hajj.

INTRODUCTION

The number of a pharmacy technicians is bigger several times than pharmacist

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and most of them working at primary care centers in Saudi Arabia.[1] They help the pharmacist of medication dispensing and Pharmaceutical. The pharmacy technician management of pharmacy store, document medication safety, and quality management report in the primary care centers. The job description of pharmacy technician well known at overseas countries while it missed in Saudi Arabia.[2-4] With past several years, the pharmacy agencies in the USA, Canada, and Australia expand the role of pharmacy technician from just preparation stage to clinical activities stage.[4-6] They can document clinical pharmacy services, screen patient lab value and drug level. Also, help the clinical pharmacist in Ambulatory care clinic operated by a pharmacist. The number of the clinical pharmacists are very few at MOH organization and difficult to cover all clinical pharmacy related performance. The pharmacy technician can help in that is issues. The demand clinical role of a pharmacy technician is very high especially in mass gathering hajj time at primary care centers.[7-9] The workforces of clinical pharmacy technician standards at MOH organization missed. It seems the mass gathering pharmaceutical care during hajj, and the assessment of pharmaceutical care program first studied in 2016 but not included pharmacy technician.[10-11] The author not familiar with published studies discussed primary care center clinical pharmacy technician workforces during mass gathering meeting or even during Hajj period in Saudi Arabia or Gulf countries and the Middle East countries also worldwide countries. The objective of the study to explore the clinical pharmacy technician activities and workforce requirements, particularly in primary health care centers, during ten years period (2006 – 2015) at Makah and Al-Medina Regions in Saudi Arabia.

Methods

It is a retrospective analysis of ten years (2006-2015) of MOH primary care center clinical pharmacy technician during mass gathering Hajj period (15 days) in Makka region and nine years (2006-2015) of MOH primary care center clinical pharmacy technician during mass gathering Hajj period (15-30 days) in Al-Madina region. All data derived from Ministry of Health. Health Statistical Year Books.[12-21] Primary healthcare is the essential healthcare and the first stage the patient face when he needs healthcare system. They manage patients with acute and chronic common illnesses and provide sufficient care for patients who do not need a hospital. The patients who need an advanced level of care referred to hospitals. National Primary care Pharmacy Competency contained; primary care pharmacist and clinical pharmacist, pharmacy administration, and different specialization clinical pharmacists.[22] The clinical pharmacy technician should help the clinical pharmacist to provide pharmaceutical to all patients either Pilgrim or not Pilgrim at Makah and Al-Medina regions. Makah region includes Mina holy places PCC; Arafat holy places PCC, and Makah city. There are about 158 Primary care centers in Makah region (46 centers in Makah city and 112 centers in the holy places).[21] Examples of competencies of clinical pharmacy in primary care centers include; general medicine competency, psychiatry competency, family medicine competency, general pediatrics competency, and other specific specializations.[22]They educate the patient about his medication and monitor his drug therapy. 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 clinical pharmacy technician. The Pharmacist and clinical pharmacist excluded from the study. The location of studies included Saudi Arabia as top propriety if not existed Gulf or Middle East countries included, if not found overall countries included. The workforce requirements calculated based on MOH workforce standards of hospitals.[23] The clinical activities drive from MOH critical care services, emergency services, and mortality rate data. The nine clinical pharmacy services characterized by reduction mortality cost-saving and mass gathering demand chosen. American College of Clinical Pharmacy (ACCP) model of clinical activities used and other literature.[2-4,24-26] The clinical pharmacy technician selected activities to support the clinical pharmacist in of fifteen units including drug information, drug utilization evaluation, critical care services, emergency services, cardiology services, infectious disease, pediatrics services, and ambulatory care services. Medication safety, pharmacy research. With others, five complementary clinical pharmacy services Infection control clinical pharmacy, Pharmacoeconomics, Pharmacokinetics or Therapeutic Drug Monitoring services, Pain management program, Anticoagulation program. The clinical pharmacy technician consisted of twenty-six selected activities to support clinical pharmacist to provide care for nine chronic diseases. It included central clinical pharmacy technician activities including; documentation of drug Information Center activities, Prepare medication educational material, Check the medication management with compliance during drug utilization evaluation, Participate in clinical pharmacy

education to pharmacy technician and nurses, and the public, and documentation of pharmacoeconomic activities. The patient-centered clinical activity including Screen and interpret of patient laboratory data, Screen of interpret drug therapy levels Ensure the medication history and medication available in the pharmacy, Check therapeutic medication plan per guidelines. Check patient medication for compliance, Perform pharmaceutical calculation, Calculate creatinine clearance, Counselling the patient with medication devices techniques, Support running ambulatory care clinics (anticoagulation clinic, pain management, diabetics. etc.), Identify and Follow up drug related problems, and Assist the pharmacist for therapeutic interchange. The Administrative, clinical pharmacy technician activities including Documentation of Medication Safety reports, follow up the administration related issues of Pharmacy research, Documentation of pharmacy intervention reports, and Documentation of patient counseling. Another clinical pharmacy program including Collection of antibiotic consumption, Follow up the microorganism resistance, Assistant with medication safety survey ISMP, and Participate in patient drug therapy committees.[2-4] The Clinical pharmacist and nonclinical pharmacist workforce excluded in the calculations. 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). In Makah Region; The total number of prescriptions at PCC (226,824-505,753) with average (411,317), it represented (7.12-20.25%) with average (16.77%) of all pilgrims. In Al-Medina Region; the total number of Pilgrims was (1,952,817-3,161,573) with average of (2,445,208). The total number of prescriptions at PCC was (35,149-207,444) with an average (142,080). It represented (1.48-8.35%) with an average (5.79%) of all pilgrims. The total number of primary care centers in Makka region was (135.7) center and in Makka city was (36 – 46) centers with an average of (41.7), while in holy places there was (80 – 112) with an average of (94) Primary Care Centers. In Al-Medina, there was (7 – 19) with average of (16.6) primary care centers. The average number of clinical pharmacy technician needed in Makka region was (67.85 FTE) divided into (47 FTE) at holy places Primary Care Centers, while (20.85 FTE) at primary care centers in Makah city. Also, the number of clinical pharmacy technician need (6.67 FTE) at primary care centers at Al-Medina Region. The total number of clinical pharmacy technician needed per 10,000 population was (122.26 FTE) in Makka region while (97.64FTE) in Al-Madina region. The number of clinical pharmacy technician based on population calculation as compared with MOH standards almost double in Makka region while incremental fourteen-times fold in Al-Medina region as explored in table 1 and table 2. The number clinical pharmacy technician is limited to apply ACCP standards in Makka while in Al-Madina region with the central pharmacy technician activities needed was (2 FTE), patient-centered clinical pharmacy technician activity was (2 FTE) while the administrative pharmacy technician activities (1 FTE). Also additional clinical pharmacy technician services or program needed (0.88 FTE).

DISCUSSION

There were tremendous changes at MOH during the period in the past several years once the MOH started the health care strategic plan. The MOH setup the several goals with the logo of patient First.[27] Based on that the general administration of Pharmaceutical Care did very comprehensive development with vision and mission to implement the Pharmaceutical Care concept over all hospital pharmacies and primary care centers pharmacies.[28] That required for improving pharmacy workforces as quantities and qualities wise. The pharmacy workforces increase from one to four pharmacists and one clinical pharmacist per each primary care center.[23] The primary care centers pharmacies skeleton changed with opened clinical pharmacy units and drug information center. Also, clinical pharmacy competencies of clinical pharmacy specialty developed.[22] Apart from this development, the pharmacy administration stated more thirty pharmacy practice and clinical pharmacy program at all primary care centers over all the kingdom of Saudi Arabia including the holy cities Makka and Al-Madina with emphasis during mass Gathering hajj period.[29] The pharmacy administration designed and implemented medication safety system, Pharmacoeconomic concept, with pain management, antimicrobial stewardship, and anticoagulation protocols through task force committee members of expert or clinical pharmacist.[30-33] By those changes, the pharmacy administration tried to support all clinical pharmacy services at primary care centers through clinical pharmacy technician to help and support the clinical pharmacist with the services especially during mass Gathering event for an instant the Hajj period. The authors investigated the clinical pharmacy technician workforce's requirements and workload of a clinical pharmacy technician in Makka and Al-Madina through using MOH standards of primary care center with 50% of the pharmacy technician worked as a clinical pharmacy technician. The finding showed clinical pharmacy technician worked as a central clinical pharmacy technician, patient specific clinical

Table 1: Number of calculated primary care center (PCC) clinical pharmacy technician based on MOH standards at Makka city and Holy places over ten years in Makka region

		Makka city				Holy places								
Y (G)	Pilgrims number	No of PCC	Number of pharmacy technician per center (MOH standards)	No of pharmacy technician	No of clinical pharmacy technician per days	no PCC	Number of pharmacy technician per center (MOH standards)	No of clinical pharmacy technician	No of clinical pharmacy technician per day	Total number of clinical pharmacy technician	Total number of clinical pharmacy technician per day	No of clinical pharmacist per 10,000	No of clinical pharmacist per 10,000 per day	No of clinical pharmacist per 10,000 per center
2006	2,378,636	36	0.5	18	1.20	89	0.5	44.5	2.97	62.5	4.17	118.93	7.93	0.95
2007	2,454,325	40	0.5	20	1.33	80	0.5	40	2.67	60	4.00	122.72	8.18	1.03
2008	2,408,849	38	0.5	19	1.27	80	0.5	40	2.67	59	3.93	120.44	8.03	1.02
2009	2,313,278	42	0.5	21	1.40	99	0.5	49.5	3.30	70.5	4.70	115.67	7.71	0.82
2010	2,789,399	43	0.5	21.5	1.43	96	0.5	48	3.20	69.5	4.63	139.47	9.30	1.01
2011	2,927,717	43	0.5	21.5	1.43	96	0.5	48	3.20	69.5	4.63	146.39	9.76	1.06
2012	3,161,573	43	0.5	21.5	1.43	96	0.5	48	3.20	69.5	4.63	158.08	10.54	1.14
2013	1,980,249	43	0.5	21.5	1.43	96	0.5	48	3.20	69.5	4.63	99.01	6.60	0.71
2014	2,085,238	43	0.5	21.5	1.43	96	0.5	48	3.20	69.5	4.63	104.26	6.95	0.75
2015	1,952,817	46	0.5	23	1.53	112	0.5	56	3.73	79	5.27	97.64	6.51	0.62
	2,445,208.10	41.70	0.5	20.85	1.39	94	0.5	47	3.13	67.85	4.52	122.26	8.15	0.91

Table 2: Number of calculated clinical pharmacy technician based on MOH standards over nine years in Al-Medina region

Al-Medina									
Y (H)	Y (G)	Pilgrims number	no PCC	Number of clinical pharmacy technician per center (MOH standards)	No of clinical pharmacy technician	No of clinical pharmacy technician per days	No of clinical pharmacist per 10,000	No of clinical pharmacist per 10,000 per day	No of clinical pharmacist per 10,000 per center
1427	2006	2,378,636	7	0.5	3.5	0.23	118.93	7.93	16.99
1428	2007	2,454,325	7	0.5	3.5	0.23	122.72	8.18	17.53
1429	2008	2,408,849	15	0.5	7.5	0.25	120.44	8.03	8.03
1430	2009	2,313,278	16	0.5	8	0.27	115.67	7.71	7.23
1431	2010	2,789,399	11	0.5	5.5	0.18	139.47	9.30	12.68
1432	2011	2,927,717	15	0.5	7.5	0.25	146.39	9.76	9.76
1433	2012	3,161,573	15	0.5	7.5	0.25	158.08	10.54	10.54
1434	2013	1,980,249	15	0.5	7.5	0.25	99.01	6.60	6.60
1435	2014	2,085,238	19	0.5	9.5	0.32	104.26	6.95	5.49
		2,499,918	13.33	0.50	6.67	0.25	97.64	6.51	5.88

pharmacy technician, and administration clinical pharmacy technician with a different number of Makka and Al-Madina cities. The demand of clinical pharmacy technician -based on per population- six times higher than MOH standards in Al-Madina, while in Makka doubled greater than MOH standards. The differences between both holy cities due higher number population based visited Makka than Al-Madina. The author suggested the number of clinical pharmacy technician changed from 0.5 FTE to 1.7 FTE per each primary care center during mass gathering Hajj period. Also, those figures of clinical pharmacy technician needed to show the paramount importance of planning before Hajj and knowing the exact number of clinical pharmacy technetium at primary care centers needed with different specialties**.** The authors could not compare the finding with other studies due seldom to find it, and it was the first study in the world in this field. After very extensive literature review an only limited number of studies discussed utilized physician and nurses during mass gathering events but not clinical pharmacy technician.[34-36] One study published in Jan 2017 about health workforce planning suggested that a population of 10,000 people needs one pharmacist.[37] However, the study done in normal environments, not in mass gathering events. The authors excluded the pharmacist and clinical pharmacist for further studies in the future.

Limitation: Although the study showed the crucial information of clinical pharmacy technician activities at primary care centers during mass gathering Hajj time. It contained certain restrictions out of author control. For instance, the workforces of clinical pharmacy technician not existed, the official documentation of clinical pharmacy technician at primary care centers missed, diminished of workforce's clinical pharmacy technician publications in Saudi Arabia. Moreover, the official documentation of economics impact clinical pharmacy technician at primary care centers missed.

CONCLUSION

The clinical pharmacy technician workforce during a mass gathering of Hajj time at primary care centers is very critical. The clinical pharmacy technicians essential supporting the clinical pharmacist for preventing drug-related problems for pilgrims, drug misadventures, and improves patient health outcomes during mass gathering events. The demand clinical pharmacy technician workforce at primary care centers is several times lower than population-based calculation during mass gathering Hajj period in Makka and Al-Madina regions, 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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