

Primary Care Center Pharmacist's Workforce in Eleven-Year 2006-2016 at Ministry of Health in Saudi Arabia

Yousef Ahmed Alomi^{1*}, Saeed Jamaan Alghamdi², Radi Abdullah Alattyh²

¹The Past Head, National Clinical pharmacy, and pharmacy practice and Pharmacy R and D Administration, Ministry of Health, Riyadh, KSA.

²General Administration of Pharmaceutical Care, Ministry of Health, P.O.BOX 100, Riyadh 11392, Riyadh, KSA.

Received: 13 December 2017;

Accepted: 28 February 2018

*Correspondence to:

Dr. Yousef Ahmed Alomi,

The Past General Manager of General Administration of Pharmaceutical Care, The Past Head, National Clinical pharmacy, and pharmacy practice, Head, Pharmacy R and D Administration, Ministry of Health, P.O.BOX 100, Riyadh 11392, Riyadh, Saudi Arabia..
Email: yalomi@gmail.com

Copyright: © the author(s), publisher and licensee Indian Academy of Pharmacists. This is an open-access article distributed under the terms of the Creative Commons Attribution Non-Commercial License, which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

Abstract

Objective: The workforce of the pharmacist is one the elements of pharmacy strategic plan in Saudi Arabia. The aim of this study is to explore primary care centers pharmacist workforce in eleven years (2006-2016) at Ministry of Health in Saudi Arabia. **Methods:** It is a retrospective analysis of eleven years (2006-2016) of MOH primary healthcare center (PCC) pharmacist workforce. All data were derived from Ministry of Health Statistical Year Books. It included a pharmacist or clinical pharmacist's workforces at MOH primary healthcare centers. All calculations were based on MOH workforce standards of PCC. All calculations were done using Microsoft Excel version ten. The calculations were per each region for a total twenty-one regions; the primary health care center s distribution numbers, the pharmacist distribution numbers, the ratio of pharmacist per primary healthcare center, the gender distribution of Pharmacist per region, the gender distribution of Saudi Pharmacist per each region across Saudi Arabia. **Result:** The total numbers of hospitals were 276 hospitals, 2,325 primary care centers, and 20 administration regions. The total numbers of pharmacist were 3,520 distributed at hospital 2,760 (78.41 %), at primary care centers 430 (12.2 %) while administration regions 330 (9.37 %). The average numbers of primary care centers were (1,961.9) with a range number of (1,925-2,325), and the total number was (2,325). The average numbers of primary care center pharmacists were (10.29) with a range number of (131-430), and the total number was (430). The average gender distribution of all primary care center pharmacists included male 210.85 (50.85%) and female 203.83 (49.15%). The average nationality distributions of all primary care center pharmacists were Saudi 360 (97.43%) and non-Saudi 51.55 (2.57%). **Conclusion:** There is very high demand and a shortage of hospital and primary care center pharmacist at Ministry of Health in Saudi Arabia. Pharmacy human resources plan should be implemented and necessary updating of pharmacist recruitment standards for hospital and primary care centers are important.

Key words: Primary care center, Pharmacist, Workforce, Ministry of Health, Saudi Arabia.

INTRODUCTION

The primary health care has the prominent role of providing essential and primary healthcare services to patients in the Kingdom of Saudi Arabia. With expanding the healthcare services, the numbers of healthcare organizations were expanded including hospitals, primary care centers, specialized health centers, and medical cities.^[1] The primary care centers consisted of medical clinics, nursing services, dental care, pharmacy services and laboratory service. The pharmacy department implemented the pharmaceutical care and emphasized the role of a pharmacists at primary care centers based on, pharmacy strategic planning, Saudi Center for Healthcare accreditation and American Society of Health-System Pharmacist.^[2-4] The PCC workforce is part of requirements to provide optimal excellence services. Several kinds of literature reported the pharmacy workforces in several countries for hospitals, industry, and community pharmacies.^[5-16] However, it is hard to find the description of PCC pharmacy workforce in full world or Saudi Arabia or Gulf and Middle East countries.^[17] The goal of this study is to explore PCC pharmacy workforce at MOH primary care centers over eleven years (2006-2016) at twenty regions in Saudi Arabia.

METHODS

It is a retrospective analysis of eleven years (2006-2016) of MOH primary healthcare center (PCC) pharmacist workforce. All data were derived from Ministry of Health Statistical Year Books.^[1,18-27] It included a pharmacist or clinical pharmacist's workforces at MOH primary healthcare centers. The type of PCC levels services included in the studies. All pharmacists expected to provide pharmaceutical according to ASHP definition and requirements. All type of pharmacy services based on Saudi Central Board of hospital accreditation, Joint Commission on Hospital Accreditation, ASHP best practice standards, and general administration of the pharmaceutical care strategic plan.^[28-32] All Pharmacist works at MOH hospitals or administration or non-MOH government hospitals and primary care centers were excluded from the studies. All private hospitals or community pharmacists were excluded from the study. All pharmacy technicians were excluded from the study. All calculations were based on MOH workforce standards of PCC. All calculations were done using Microsoft Excel version ten. The calculations were per each region for a total twenty-one regions; the primary health care centers distribution numbers, the pharmacist distribution numbers, the ratio of pharmacist per primary healthcare center, the gender distribution of Pharmacists per region, the gender distribution of Saudi Pharmacists per each region across Saudi Arabia.

RESULT

The total numbers of hospitals were 276 hospitals, 2,325 primary care centers, and 20 administration regions. The total numbers of pharmacists were 3,520 distributed at hospital 2,760 (78.41 %), at primary care centers 430 (12.2 %) while administration regions 330 (9.37 %) the last update information October 2016 as explored in Table 1. The average numbers of primary care centers were (1,961.9) with a range number of (1,925-2,325), and the total number was (2,325). The highest region had a number of primary care centers were Riyadh (401.55) followed by Aseer (246.36) and Quseen regions (157.18) of PCC. The average numbers of primary care center pharmacists were (10.29) with a range number of (131-430), and the total number was (430). The highest region had a number of primary care center pharmacists was Riyadh (79) followed by Aseer (17.46) and East Province regions (15.27) pharmacists as explore in Table 2 and Table 3. The average gender distribution of all primary care center pharmacists was male 210.85 (50.85%) and female 203.83 (49.15%). The average nationality distributions of all primary care center pharmacists were Saudi 360 (97.43%) and non-Saudi 51.55 (2.57%). Of Saudi primary care center pharmacists 185.85 (51.25%) were male and 176.79 (48.75 %) were female as explored in Table 4, 5 and 6.

DISCUSSION

The Ministry of Health over the past several years have increased the number of primary care healthcare centers several times over twenty regions.^[1] The MOH during strategic health planning updated the skeletons, geographic

locations, internal departments, the type of level devices, and type of specialties. In addition to primary care centers standard collaborations with Saudi Center for Healthcare Accreditation.^[3] The pharmacy administration founded national pharmacy practice and clinical program, national pharmacy administration program, primary care pharmacy administration, PCC pharmacist competencies and primary care pharmacy workforce.^[2,33-35] All those things occurred based on MOH strategic plan and updated pharmacy strategic plan and review of requirements of PCC from all PCC pharmacy-related issues.^[32] The authors reviewed the past eleven years of the workforce of a pharmacist at MOH primary healthcare at twenty regions in the Kingdom of Saudi Arabia. The findings showed that, with incremental of number of PCC the number of a pharmacists working are still the same or decreased sometime over twenty regions in Kingdom of Saudi Arabia. The gender distribution was almost fifty percent male and female even with Saudi pharmacist. However, in Riyadh city the female pharmacists were more than a male pharmacist, and most of them were from Saudi. In general, most of the new graduated female pharmacist wished to work at a hospital or PCC governmental sectors. They found very high job security than private sectors. Also, the male pharmacist wishes to work at pharmaceutical companies due to high salaries than governmental hospital or PCC, and excellent career development. The number of PCC is high in Riyadh city and most of the pharmaceutical companies located in Riyadh city. The nationality distribution was very high Saudi pharmacist due to full implementation of Saudization at Primary care centers. Another parameter of pharmacy workforces at PCC could not mention because it missed at MOH

Table 1: demographic information of hospital and primary care distributions current year.

	Region	No of Hospitals	No of PCC	No of Hospital Pharmacist	No of PCC Pharmacist	No of Pharmacist at Directorates
	MOH	0	0	0	0	137
1	Riyadh	42	418	497	117	37
2	Makkah	10	84	230	14	19
3	Jeddah	13	88	142	24	12
4	Taif	13	121	90	9	8
5	Madina	20	164	137	26	12
6	Quseen	19	170	136	19	11
7	East Province	20	136	169	21	11
8	Alhasa	11	75	62	10	0
9	Heralbatin	7	36	32	4	4
10	Aseer	20	249	163	32	15
11	Bisha	7	91	42	5	4
12	Tabouk	11	77	66	9	3
13	Hail	13	105	53	5	14
14	North Boarder	9	46	40	3	9
15	Jazan	21	159	128	11	5
16	Najran	12	68	79	7	13
17	Albaha	10	102	56	6	4
18	Aljouf	9	37	38	1	5
19	Alqurayat	4	18	22	2	2
20	Qunfetha	5	37	24	1	5
	Total	276	2325	2760	430	330

Table 2: Total number of PCC.

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	Average
Riyadh	361	361	377	399	399	401	435	435	418	407	424	401.55
Makkah	75	74	67	84	84	84	355	92	84	83	83	105.91
Jeddah	75	75	80	93	93	93	Missing Data	108	88	88	90	88.30
Taif	104	104	105	112	112	112	Missing Data	120	121	120	121	113.10
Madina	134	134	134	143	143	143	154	154	164	162	162	147.91
Quseen	142	145	152	151	151	151	159	159	170	172	177	157.18
East Province	112	114	126	124	124	126	248	136	136	138	140	138.55
Alhasa	57	57	68	63	63	64	Missing Data	71	75	73	70	66.10
Heralbatin	29	32	34	38	38	38	Missing Data	41	36	40	40	36.60
Aseer	253	250	227	227	227	227	317	238	249	246	249	246.36
Bisha	36	36	72	76	76	76	Missing Data	79	91	81	85	70.80
Tabouk	62	62	67	67	67	68	73	73	77	81	83	70.91
Hail	88	89	93	93	93	96	100	100	105	105	105	97.00
North Boarder	40	39	41	43	43	43	45	45	46	45	47	43.36
Jazan	134	134	149	146	146	146	155	155	159	179	178	152.82
Najran	61	59	62	61	61	61	65	65	68	66	68	63.36
Albaha	86	86	91	93	93	98	101	101	102	104	105	96.36
Aljof	29	28	33	33	33	33	52	35	37	40	42	35.91
Alqurayat	18	17	20	16	16	16	Missing Data	17	18	15	19	17.20
Qunfetha	29	29	30	32	32	33	Missing Data	35	37	37	37	33.10
TOTAL	1925	1925	2028	2094	2094	2109	259	2259	2281	2282	2325	1,961.91
Average per city	96.25	96.25	101.40	104.70	104.70	105.45	173.77	112.95	114.05	114.10	116.25	112.72

Table 3: Total number of PCC pharmacist.

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	Average
Riyadh	59	104	79	12	2	68	74	80	117	135	139	79.00
Makkah	0	23	16	11	3	12	14	6	14	8	15	11.09
Jeddah	24	21	2	4	2	11	0	10	24	22	25	13.18
Taif	1	1	0	3	0	6	0	3	9	15	14	4.73
Madina	8	4	15	5	0	11	7	8	26	22	25	11.91
Quseen	4	16	0	6	0	6	2	11	19	21	20	9.55
East Province	11	15	15	10	3	13	9	11	21	26	34	15.27
Alhasa	0	0	0	1	0	6	0	0	10	11	14	3.82
Heralbatin	0	0	0	0	0	6	0	0	4	3	5	1.64
Aseer	0	0	0	10	0	14	8	13	32	54	61	17.46
Bisha	1	6	5	2	1	5	0	0	5	7	9	3.73
Tabouk	2	2	2	2	2	5	1	2	9	8	11	4.18
Hail	0	1	2	2	1	8	1	4	5	7	8	3.55
North Boarder	1	1	1	0	0	9	3	3	3	3	6	2.73
Jazan	13	8	14	9	1	17	10	4	11	11	13	10.09
Najran	1	0	1	8	0	9	2	2	7	7	13	4.55
Albaha	0	3	5	3	1	5	5	6	6	6	4	4.00
Aljof	0	1	0	1	1	5	1	1	1	2	5	1.64
Alqurayat	7	3	2	0	0	2	0	0	2	3	3	2.00
Qunfetha	2	2	0	2	1	1	0	0	1	3	6	1.64
TOTAL	131	211	163	91	18	219	137	164	326	374	430	10.29
Average per city	6.700	10.550	7.950	4.550	0.900	10.950	6.850	8.200	16.300	18.700	21.500	

Table 4: Gender Distribution of PCC Pharmacist per region.

	2006		2007		2008		2009		2010		2011		2012		2013		2014		2015		2016		Mean	
	F	M	F	M	F	M	F	M	F	M	235	169	F	M	F	M	F	M	F	M	F	M	F	M
Riyadh	20	39	68	36	44	35	11	1	1	1	47	21	72	2	77	3	98	19	113	22	114	25	60.45	18.55
Makkah	0	0	7	16	3	17	3	8	1	2	3	9	4	10	3	3	9	5	6	2	10	5	4.45	7.00
Jeddah	0	21	0	21	0	2	1	3	0	2	1	10	0	0	5	5	9	15	9	13	10	15	3.50	10.70
Taif	0	1	0	1	0	0	2	1	0	0	2	4	0	0	2	1	2	7	4	11	3	11	1.50	3.70
Madina	1	7	1	3	2	13	1	4	0	0	1	10	3	4	3	5	6	20	6	16	9	16	3.00	8.91
Quseen	1	3	0	16	0	0	0	6	0	0	3	3	0	2	3	8	3	16	6	15	5	15	1.91	7.64
East Province	5	6	12	3	12	3	8	2	3	0	5	8	5	4	6	5	10	11	14	12	25	9	9.55	5.73
Alhasa	0	0	0	0	0	0	0	1	0	0	1	5	0	0	0	0	5	5	5	6	6	8	1.70	2.50
Heralbatin	0	0	0	0	0	0	0	0	0	0	2	4	0	0	0	0	2	2	1	2	2	3	0.70	1.10
Aseer	0	0	0	0	0	0	1	9	0	0	1	13	1	7	9	4	14	18	18	36	18	43	5.64	11.82
Bisha	1	0	1	5	2	3	1	1	1	0	1	4	0	0	0	0	0	5	3	4	3	6	1.30	2.80
Tabouk	0	2	0	2	0	2	1	1	0	2	1	4	0	1	1	1	5	4	6	2	7	4	1.91	2.27
Hail	0	0	1	0	0	2	0	2	0	1	0	8	0	1	0	4	0	5	0	7	0	8	0.09	3.45
North Boarder	1	0	1	0	1	0	0	0	0	0	3	6	3	0	3	0	3	0	3	0	4	2	2.00	0.73
Jazan	4	9	0	8	0	14	0	9	0	1	2	15	0	10	1	3	3	8	3	8	4	9	1.55	8.55
Najran	1	0	0	0	0	1	1	7	0	0	2	7	1	1	1	1	1	6	0	7	0	13	0.64	3.91
Albaha	0	0	2	1	2	3	1	2	1	0	0	5	1	4	1	5	1	5	2	4	1	3	1.09	2.91
Aljouf	0	0	0	1	0	0	0	1	0	1	0	5	0	1	0	1	0	1	0	2	0	5	0.00	1.64
Aqurayat	5	2	2	1	0	2	0	0	0	0	0	2	0	0	0	0	1	1	1	2	1	2	1.00	1.20
Qunfetha	0	2	0	2	0	0	1	1	0	1	0	1	0	0	0	0	0	1	1	2	2	4	0.40	1.40
TOTAL	39	92	95	116	66	97	32	59	7	11	75	144	90	47	115	49	172	154	201	173	224	206	203.83	210.85
Average	2.0	4.6	4.8	5.8	3.3	4.9	1.6	3.0	0.4	0.6	3.8	7.2	4.5	2.4	5.8	2.5	8.6	7.7	10.1	8.7	11.2	10.3	49.15%	50.85%

Table 5: Nationality Distribution of PCC Pharmacist per region.

	2006		2007		2008		2009		2010		2011		2012		2013		2014		2015		2016		Mean	
	S	NS	S	NS	S	NS	S	NS	S	NS	S	NS	S	NS	S	NS	S	NS	S	NS	S	NS	S	NS
Riyadh	40	19	89	15	75	4	12	0	2	0	68	0	74	0	80	0	117	0	134	1	138	1	75.36	3.64
Makkah	0	0	20	3	15	1	10	1	2	1	12	0	10	4	6	0	14	0	8	0	15	0	10.18	0.91
Jeddah	15	9	15	6	2	0	4	0	2	0	10	1	0	0	10	0	24	0	22	0	25	0	11.73	1.45
Taif	1	0	1	0	0	0	1	2	0	0	4	2	0	0	1	2	9	0	15	0	14	0	4.18	0.55
Madina	5	3	2	2	11	4	4	1	0	0	7	4	1	6	5	3	22	4	18	4	20	5	8.64	3.27
Quseen	1	3	15	1	0	0	1	5	0	0	6	0	2	0	9	2	18	1	20	1	19	1	8.27	1.27
East Province	8	3	13	2	13	2	10	0	3	0	13	0	9	0	11	0	21	0	26	0	34	0	14.64	0.64
Alhasa	0	0	0	0	0	0	0	1	0	0	6	0	0	0	0	0	10	0	11	0	14	0	3.73	0.09
Heralbatin	0	0	0	0	0	0	0	0	0	0	6	0	0	0	0	0	4	0	3	0	5	0	1.64	0.00
Aseer	0	0	0	0	0	0	6	4	0	0	9	5	7	1	12	1	32	0	54	0	61	0	16.45	1.00
Bisha	0	1	2	4	3	2	2	0	1	0	4	1	0	0	0	0	4	1	6	1	8	1	2.73	1.00
Tabouk	0	2	1	1	2	0	1	1	1	1	4	1	0	1	2	0	9	0	7	1	10	1	3.36	0.82
Hail	0	0	0	1	0	2	2	0	1	0	6	2	1	0	3	1	5	0	7	0	8	0	3.00	0.55
North Boarder	1	0	1	0	1	0	0	0	0	0	5	4	2	1	2	1	2	1	2	1	5	1	1.91	0.82
Jazan	4	9	0	8	1	13	6	3	1	0	7	10	2	8	3	1	11	0	11	0	13	0	5.36	4.73
Najran	0	1	0	0	0	1	5	3	0	0	7	2	1	1	1	1	6	1	7	0	13	0	3.64	0.91
Albaha	0	0	0	3	3	2	0	3	0	1	1	4	0	5	2	4	4	2	4	2	3	1	1.55	2.45
Aljouf	0	0	1	0	0	0	1	0	1	0	3	2	0	1	0	1	0	1	2	0	5	0	1.18	0.45
Aqurayat	0	7	0	3	2	0	0	0	0	0	2	0	0	0	0	0	2	0	3	0	3	0	1.09	0.91
Qunfetha	2	0	2	0	0	0	0	2	0	1	1	0	0	0	0	0	1	0	3	0	6	0	1.36	0.27
TOTAL	77	54	162	49	128	35	65	26	14	4	181	38	109	28	147	17	315	11	363	11	419	11	360.00	51.55
Average	3.9	2.9	8.1	2.5	6.4	1.6	3.3	1.3	0.7	0.2	9.1	1.9	5.5	1.4	7.4	0.9	15.8	0.6	18.2	0.6	21.0	0.6	97.43%	2.57%

Table 6: Gender Distribution of Saudi PCC Pharmacist per region.

	2006		2007		2008		2009		2010		2011		2012		2013		2014		2015		2016		Mean	
	F	M	F	M	F	M	F	M	F	M	169	235	F	M	F	M	F	M	F	M	F	M	F	M
Riyadh	17	23	62	27	43	32	11	1	1	1	47	21	72	2	77	3	98	19	113	21	114	24	59.55	15.82
Makkah	0	0	5	15	1	14	3	7	1	1	3	9	3	3	3	3	9	5	6	2	10	5	4.00	6.18
Jeddah	0	15	0	15	0	2	1	3	0	2	1	9	0	0	5	5	9	15	9	13	10	15	3.50	9.40
Taif	0	1	0	1	0	0	0	1	0	0	1	3	0	0	0	1	2	7	4	11	3	11	1.00	3.60
Madina	0	5	0	2	1	10	1	3	0	0	0	7	0	1	0	5	2	20	2	16	4	16	0.91	7.73
Quseen	0	1	0	15	0	0	0	1	0	0	3	3	0	2	2	7	2	16	5	15	4	15	1.45	6.82
East Province	4	4	11	2	11	2	8	2	3	0	5	8	5	4	6	5	10	11	14	12	25	9	9.27	5.36
Alhasa	0	0	0	0	0	0	0	0	0	0	1	5	0	0	0	0	5	5	5	6	6	8	1.70	2.40
Heralbatin	0	0	0	0	0	0	0	0	0	0	2	4	0	0	0	0	2	2	1	2	2	3	0.70	1.10
Aseer	0	0	0	0	0	0	0	6	0	0	0	9	0	7	8	4	14	18	18	36	18	43	5.27	11.18
Bisha	0	0	0	2	0	3	1	1	1	0	1	3	0	0	0	0	0	4	3	3	3	5	0.90	2.10
Tabouk	0	0	0	1	0	2	0	1	0	1	1	3	0	0	1	1	5	4	5	2	6	4	1.64	1.73
Hail	0	0	0	0	0	0	0	0	0	1	0	6	0	1	0	3	0	5	0	7	0	8	0.00	3.00
North Boarder	1	0	1	0	1	0	0	0	0	0	2	3	2	0	2	0	2	3	2	0	3	2	1.45	0.45
Jazan	2	2	0	0	0	1	0	6	0	1	0	7	0	2	1	2	3	8	3	8	4	9	1.18	4.18
Najran	0	0	0	0	0	0	0	5	0	0	0	7	0	1	0	1	0	6	0	7	0	13	0.00	3.64
Albaha	0	0	0	0	0	3	0	0	0	0	0	1	0	0	0	2	0	4	1	3	1	2	0.18	1.36
Aljouf	0	0	0	1	0	0	0	1	0	1	0	3	0	0	0	0	0	0	0	2	0	5	0.00	1.18
Alqurayyat	0	0	0	0	0	2	0	0	0	0	0	2	0	0	0	0	1	1	1	2	1	2	0.30	0.90
Qunfetha	0	2	0	2	0	0	0	0	0	0	0	1	0	0	0	0	0	1	1	2	2	4	0.30	1.20
TOTAL	24	53	79	83	57	71	25	40	6	8	67	114	82	27	105	42	164	151	193	170	216	203	185.85	176.79
Average	1.2	2.7	4.0	4.2	2.9	3.6	1.3	2.0	0.3	0.4	3.4	5.7	4.1	1.4	5.3	2.1	8.2	7.6	9.7	8.5	10.8	10.2	51.25%	48.75%

statistical books. Most of the studies not investigated at primary healthcare centers, and difficult to compare with them due to it is the first study in Saudi Arabia, Gulf and Middle East counties and even over all the world.

CONCLUSION

The numbers of pharmacists were inferior at Primary health care centers. The Saudization program had a full implementation at primary care centers. The gender distribution of pharmacists are almost equal in ratio and there was a significant difference at some places like Riyadh city. Targeting for increasing the number of a pharmacists with the equal percentage of male and female gender at Ministry of Health primary care centers is highly recommended to improve pharmaceutical care services offered to the patients.

ACKNOWLEDGEMENT

None

CONFLICT OF INTEREST

None

ABBREVIATION USED

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

REFERENCES

1. Saudi Ministry of Health. Health Statistical Year Book. 2016. Saudi Ministry of Health; 2016. Available from: <http://www.moh.gov.sa/en/Ministry/Statistics/book/Pages/default.aspx>
2. Alomi YA. National Primary Care Pharmacist Competency System at MOH in Saudi Arabia. J Pharm Pharm Sci. 2016;1(4):1-5.
3. The Saudi Central Board For Accreditation Of Healthcare Institutions (CBAHI). Primary Healthcare Accreditation Standards. 2011. 1-135 p.
4. Kimberly A. Galt, Richard F. Demers RNH. ASHP statement on the pharmacist's role in primary care. Am J Heal Pharm. 1999;56(16):1665-7.
5. Mcleod DC. Contrast in Pharmacy Manpower Planning between the United States and Northern European Countries. Drug Intell Clin Pharm. 1986;20:210-2.
6. HRSA. A study of the supply and demand for pharmacists. Department of Health and Human Services. 2000. p. 100. Available from: www.fip.org/humanresource
7. Bond CA, Raehl CL, Patry R. Evidence-based core clinical pharmacy services in United States hospitals in 2020: services and staffing. Pharmacotherapy. 2004;24(4):427-40.
8. Bond CA, Raehl CL. Clinical pharmacy services, pharmacy staffing, and adverse drug reactions in United States hospitals. Pharmacotherapy. 2006;26(6):735-47.
9. Bond CA, Raehl CL. Clinical pharmacy services, pharmacy staffing, and hospital mortality rates. Pharmacotherapy. 2007;27(4):481-93.
10. Hawthorne N, Anderson C. The global pharmacy workforce: A systematic review of the literature. Hum Resour Health. 2009;7(1):48.
11. Gal D, Bates I. 2012 FIP Global Pharmacy Workforce Report. 2012. Available from: www.fip.org/humanresource
12. Workforce H. Pharmacist Workforce. 2012. — Provincial / Territorial Highlights. 2012;
13. Health Workforce Australia. Australia's Health Workforce Series: Pharmacists in Focus. 2014:1-47.
14. Gaither CA, Schommer JC, Doucette WR, Kreling DH, Mott DA. 2014. National Pharmacist Workforce Survey. Workforce. 2015. Available from: <http://www.pharmacy.wsu.edu/information/2009.Pharmacist.Workforce.Survey.pdf>
15. Robinson E, Shcherbakova N. Assessment of Pharmacy Manpower and Services in New England. J Pharm Pract. 2016;29(6):549-55.
16. Pedersen CA, Schneider PJ, Scheckelhoff DJ. ASHP national survey of pharmacy practice in hospital settings: Dispensing and administration - 2014. Am J Heal Pharm. 2015;62(4):378-90.
17. Smith MA. Pharmacists and the primary care workforce. Ann Pharmacother. 2012;46(11):1568-71.
18. Health Statistical Year Book 2006. Saudi Ministry of Health. Available from: <http://www.moh.gov.sa/en/Ministry/Statistics/book/Pages/default.aspx>.

19. Health Statistical Year Book 2007. Saudi Ministry of Health. Available from: <http://www.moh.gov.sa/en/Ministry/Statistics/book/Pages/default.aspx>.
20. Health Statistical Year Book 2008. Saudi Ministry of Health. Available from: <http://www.moh.gov.sa/en/Ministry/Statistics/book/Pages/default.aspx>.
21. Health Statistical Year Book 2009. Saudi Ministry of Health. Available from: <http://www.moh.gov.sa/en/Ministry/Statistics/book/Pages/default.aspx>.
22. Health Statistical Year Book 2010. Saudi Ministry of Health. Available from: <http://www.moh.gov.sa/en/Ministry/Statistics/book/Pages/default.aspx>.
23. Health Statistical Year Book 2011. Saudi Ministry of Health. Available from: <http://www.moh.gov.sa/en/Ministry/Statistics/book/Pages/default.aspx>.
24. Health Statistical Year Book 2012. Saudi Ministry of Health. Available from: <http://www.moh.gov.sa/en/Ministry/Statistics/book/Pages/default.aspx>.
25. Health Statistical Year Book 2013. Saudi Ministry of Health. Available from: <http://www.moh.gov.sa/en/Ministry/Statistics/book/Pages/default.aspx>.
26. Health Statistical Year Book 2014. Saudi Ministry of Health. Available from: <http://www.moh.gov.sa/en/Ministry/Statistics/book/Pages/default.aspx>.
27. Health Statistical Year Book 2015. Saudi Ministry of Health. Available from: <http://www.moh.gov.sa/en/Ministry/Statistics/book/Pages/default.aspx>.
28. ASHP Statement on Pharmaceutical Care. *Am J Hosp Pharm.* 1993;50:1720-3.
29. ASHP Guidelines on a Standardized Method for Pharmaceutical Care. *Am Soc Heal Pharm.* 1996;53(14):1713-6.
30. Medication Management (MM). In: National Hospital Standards. 2nd Ed. Saudi Central Board for Accreditation of Healthcare Institutions. 2015:194-211. Available from: <http://www.cbahi.gov.sa>.
31. Comprehensive Accreditation Manuals. Joint Commission Resources. Available from: <http://www.jcrinc.com/store/publications/manuals/>
32. Alomi YA, Alghamdi SJ, Alattyh RA. Strategic Plan of General Administration of Pharmaceutical Care at Ministry of Health in Saudi Arabia 2012–2022. *J Pharm Pharm Sci.* 2015;1(3):1-8.
33. Alomi YA. National Pharmacy Practice Programs at Ministry of Health in Saudi Arabia. *JPharm Pharm Sci.* 2015;1(2):17-8.
34. Alomi YA. National Pharmacy Administration Programs at Ministry of Health in Saudi Arabia. *BAOJ Pharm Sci.* 2015;1(9).
35. Alomi YA. Primary Care Center Pharmacy Manpower New Guidelines in Saudi Arabia. *J Pharmacol Clin Res.* 2016;1(1).

Cite this article as: Alomi YA, Alghamdi SJ, Alattyh RA. Primary Care Center Pharmacist's Workforce in Eleven-Year 2006-2016 at Ministry of Health in Saudi Arabia. *J Pharm Pract Community Med.* 2018;4(1s):S126-S131.