The Demand of Hospital Pharmacist Workforce in Past Eleven Years (2006-2016) and Forecasting Future Fifteen Years (2016-2030) at all Healthcare Institutions in Saudi Arabia

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Abstract

Objective: To explore hospital pharmacist's workforce demand in past eleven years (2006-2016) and forecasting future fifteen years (2016-2030) at all hospitals of healthcare institutions in Saudi Arabia.

Methods: It is a retrospective analysis of eleven years (2006-2016) of MOH hospital pharmacist workforce. All data were derived from Ministry of Health Statistical Year Books. It included pharmacist or clinical pharmacist's workforces at hospitals in Kingdom of Saudi Arabia. The type of hospital included having bed capacity 50-1500 beds with Adults public hospitals, pediatrics and maternity hospitals, Psychiatric hospitals, Diabetic centers, Cardiology centers, Oncology Centers, Renal Dialysis Centers, and Medical cities. All calculations based on MOH workforce standards of hospitals population increases annually. The calculations done per each region for a total of twenty-one regions, the hospital beds distribution numbers, the ratio of pharmacist per bed, total number of demand pharmacist per each sector, the expected number of pharmacist requirement in the coming years 2016-2030 per each sectors across Saudi Arabia. **Result:** The total number of hospitals were 466 in the kingdom of Saudi Arabia, 274 (58.8%) Ministry of Health hospitals, 152 (32.6%) private hospitals, and 40 (8.6%) non-MOH governmental hospitals. Over the eleven years, the average numbers of hospitals were (423.45) with a range number of (384-467), and the total number was (467). The average numbers of hospital beds were (60,779.55) with a range number of (54,719-70,844), and the total number was (70,844). The average numbers of pharmacists per hospital were (10.31) with a range number of (8.63-14.04). The total average demand hospitals were (7,750.64) with range (7,628.80-7,609.80) with total number demand was (7,609.80) hospital pharmacists. The total demand hospital pharmacists at all sectors by the year 2030 will be (36,645.87) with range (25,794- 36,645.87).

Conclusion: The highest demand for hospital pharmacists will be at MOH hospital sectors because of the large numbers of hospitals and many serving the population. Revision of hospital pharmacists' jobs is mandatory and sharing with private hospitals is the requirement.

Key words: Hospital pharmacist, Workforces, Manpower, Ministry of health, Saudi Arabia.

INTRODUCTION

The most healthcare care services in Saudi Arabia covered by Ministry of Health (MOH) with coverage of sixty percent of the population. The non-MOH government with private sectors covered twenty percent of the population in Saudi Arabia. The Ministry of Health started a newly updated healthcare care system based on vision 2030 and updated the last healthcare strategic plan.^[1,2] The updated requirements are cost calculation of healthcare foundation, instruments, and human resources. Also, the budget of the health institutions currently and in the future is required. The very significant part of budget planning is human resources of healthcare providers including pharmacy services. Several studies reported the pharmacy workforce and others projection of hospital pharmacist demand in future at multiple countries.^[3-13] It is very hard to find investigations about pharmacy demand in the current year and futures and comparison among all health care sections in the kingdom of Saudi Arabia. The objective of this study is to explore the pharmacist workforce demand and their requirement currently and in future in all healthcare organizations.

METHODS

It is a retrospective analysis of eleven years (2006-2016) of MOH hospital pharmacist workforce. All data were derived from Ministry of Health Statistical Year Books.^[16-26] It included pharmacist or clinical pharmacist's workforces at hospitals in Kingdom of Saudi Arabia. The type of hospital included having bed capacity 50-1500 beds with Adults public hospitals, pediatrics and maternity hospitals, Psychiatric hospitals, Diabetic centers, Cardiology centers, Oncology Centers, Renal Dialysis Centers, and Medical cities. All Pharmacist works at MOH Hospitals and non-MOH government hospitals including; University Hospitals, Armed Forces Hospitals, National Gaud Hospitals, Security Forces hospitals, King Faisal Specialist hospital and research center, Royal Commission for Jubail and Yanbu Hospitals, Aramco Hospitals, included in the studies. All private hospital included in the study. All community pharmacies or pharmacy technician excluded from the study. All pharmacists were expected to provide pharmaceutical care according to ASHP definition and requirements. All type of pharmacy services were based on Saudi Central Board of hospital accreditation, a joint commission of hospital accreditation, ASHP best practice standards,

Table 1: The number and type of hospitals.

Region	No of Hospitals	Small <100	Medium 100–299	Large 300–399	Large 400- > or = 600	Medical Cities
1 Ministry of health	274	140	95	18	21	2
2 University Hospitals	4	1	0	0	2	1
3 Armed Forces Hospitals	24	8	11	3	1	1
4 Hospitals in the National Guard	5	0	3	0	0	2
5 Hospitals, Security Forces	3	0	0	2	1	0
6 King Faisal Specialist Hospital and Research	2	0	0	1	1	0
7 Hospitals, the Royal Commission for Jubail and Yanbu	1	0	0	1	0	0
8 Aramco Hospitals	1	0	0	1	0	0
9 Private hospitals	152	97	32	5	7	0
Total	466	246	141	31	33	6

Table 2: Total number of beds.

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	Average
Ministry of health	31,877	31,420	31,720	33,277	34,370	34,450	35,828	38,970	40,300	41,297	41,835	35,940.36
University Hospitals	1,776	1,876	1,878	1,745	1,845	1,826	1,850	1,772	1,807	1,816	1,792	1,816.64
Armed Forces Hospitals	5,074	5,141	5,172	5,179	5,185	5,215	5,215	5,215	5,393	4,772	4,772	5,121.18
Hospitals in the National Guard	1,509	1,597	1,547	1,547	1,751	1,751	1,759	1,791	2,085	2,067	2,178	1,780.18
Hospitals, Security Forces	346	346	347	347	349	349	349	801	862	867	864	529.73
King Faisal specialist hospital and research	691	983	1,008	1,010	1,036	1,049	1,087	1,112	1,118	1,144	1,164	1,036.55
Royal Commission for Jubail and Yanbu	456	485	459	464	447	432	449	490	402	417	445	449.64
Aramco Hospitals	400	400	400	400	326	326	334	316	365	366	366	363.55
Private hospitals	12,590	11,271	11,135	11,833	12,817	13,298	14,165	14,310	15,664	16,648	17,428	13,741.73
Total	54,719	53,519	53,666	55,802	58,126	58,696	61,036	64,777	67,996	69,394	70,844	60,775.55
Average	10,943.80	10,703.80	10,733.20	11,160.40	11,625.20	11,739.20	12,207.20	12,955.40	13,599.20	13,878.80	14,168.80	

and general administration of the pharmaceutical care strategic plan.^[27-31] All calculations were based on MOH workforce standards of hospitals population, increases annually. All calculation done used Microsoft Excel version ten. The calculations were per each region for a total of twenty-one regions, the hospital beds distribution numbers, the ratio of pharmacist per bed, total number of demand pharmacist per each sector, the expected number of pharmacist requirement in the coming years 2016-2030 per each sector were estimated across Saudi Arabia.

RESULTS

The total numbers of hospitals were 466 in the kingdom of Saudi Arabia, 274 (58.8%) Ministry of Health hospitals, 152 (32.6%) private hospitals, and 40 (8.6%) non-MOH governmental hospitals. Over the eleven years, the average numbers of hospitals were (423.45) with a range number of (384-467), and the total number was (467). The average numbers of hospital beds were (60,779.55) with a range number of (54,719-70,844), and the total number was (70,844). The sector had highest number of hospital beds were Ministry of health (35,940.36) followed by Private hospitals (13,741.73) and Armed Forces Hospitals (5,121.18) as explored in Table 2. The average numbers of pharmacists per hospital were (10.31) with a range number of (8.63-14.04). The sector had highest number of pharmacists per each hospital was King Faisal specialist hospital and research (149.27) followed by Aramco Hospitals (93.00) and Hospitals in the National Guard (82.06) as explore in Table 3. The average numbers of pharmacists per bed were (1.316) with a range number of (1.178-1.607). The highest sector had a number of pharmacists per each bed was Aramco Hospitals (0.257) followed by King Faisal specialist hospital and research (0.254) and Hospitals in the National Guard sector (0.217) as explored in Table 4. The total average demand hospitals were (7,750.64) with range (7,628.80-7,609.80) with total number demand was (7,609.80) hospital pharmacists. The high demand for hospital pharmacists were in Ministry of health regions (5,563.07), followed by Private Hospitals sector (1,511.88) and Armed Forces Hospitals (474.05). The total projection of hospital pharmacists in all sectors by the year 2030 will be (20,129.80) with range (14,168.80- 20,129.80) as explored in Table 5 and 6.

DISCUSSION

The healthcare care system updated during the period 2010-2020 with the strategic plan and several achievements.^[32] New update of healthcare system during new vision 2030 and privatization, health insurance of healthcare organization.^[33] It including hospitals and primary healthcare services at MOH, all other governmental sectors included for an instant but not limited to the National Guard hospitals, University institutions, Military organizations, and private hospitals. All the sectors need to calculate all related departments and switch financial budget. Parts of calculations were pharmacist workforce demand and budget-related issues. The calculation started with current year and futures over several years. The authors investigated the hospital pharmacists' demand at all healthcare sectors. The findings showed the MOH hospitals and private hospitals were with the lowest numbers of pharmacists per hospital or with high demanding of pharmacists while King Faisal hospital, Aramco hospital were with the least demand of pharmacists, highest number of pharmacist per hospital or with the lower demand of pharmacist either currently or in the years 2030. The reason behind that is related the cumulative demand in the past and the future with increasing number of hospitals and beds at MOH and private's organization. The King Faisal hospital, Aramco hospital had a previous excellent number of pharmacists without increasing demand, and there is no increase in a total number of beds or hospitals. The calculated number of demand at present or in the futures is lower than what reported in two studied beyond CA *et al.* and Knapp DA because of both studies were done in the USA, and it is the difference between the populations. Also, the USA standard requirement is entirely different from Saudi Arabia, almost

Table 3: Total number of pharmacist/ hospital.											
	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	Average
Ministry of health	2.89	3.57	4.61	5.59	6.43	5.92	6.41	7.15	8.29	8.72	6.32
University Hospitals	40.75	42.00	43.50	73.75	73.75	74.50	74.75	76.75	78.25	62.40	66.49
Armed Forces Hospitals	14.63	18.38	18.83	19.71	22.17	23.96	23.96	23.96	27.33	29.63	22.93
Hospitals in the National Guard	73.75	77.25	74.25	62.40	78.20	78.20	78.20	79.80	87.20	94.80	82.06
Hospitals, Security Forces	43.00	24.50	42.00	50.00	58.00	58.00	58.00	19.33	30.00	34.00	41.01
King Faisal specialist hospital and research	177.00	196.00	118.50	93.50	136.50	141.00	149.00	194.50	138.00	146.50	149.27
Hospitals, the Royal Commission for Jubail and Yanbu	16.50	10.00	12.00	14.50	14.50	15.50	17.00	5.40	20.00	21.50	15.58
Aramco Hospitals	91.00	100.00	99.00	91.00	87.00	86.00	86.00	89.00	84.00	87.00	93.00
Private hospitals	12.02	11.48	8.21	9.80	6.43	7.24	7.16	NA	9.51	10.22	9.26
Total average per hospital (all organization)	8.63	9.06	8.69	9.87	9.84	9.88	10.08	8.39	12.11	12.78	10.31
Average per organization	48.02	49.22	42.96	43.01	49.28	50.02	51.06	56.03	49.47	50.76	60.70

Table 4: Total number of pharmacist/ bed.

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	Average
Ministry of health	0.020	0.026	0.034	0.041	0.047	0.043	0.046	0.049	0.056	0.058	0.065	0.044
University Hospitals	0.092	0.090	0.093	0.169	0.160	0.163	0.162	0.173	0.173	0.172	0.203	0.150
Armed Forces Hospitals	0.069	0.086	0.087	0.091	0.103	0.110	0.110	0.110	0.122	0.149	0.149	0.108
Hospitals in the National Guard	0.195	0.193	0.192	0.202	0.223	0.223	0.222	0.223	0.209	0.229	0.272	0.217
Hospitals, Security Forces	0.124	0.142	0.121	0.144	0.166	0.166	0.166	0.072	0.104	0.118	0.119	0.131
King Faisal specialist hospital and research	0.256	0.199	0.235	0.185	0.264	0.269	0.274	0.350	0.247	0.256	0.260	0.254
Hospitals, the Royal Commission for Jubail and Yanbu	0.072	0.041	0.052	0.063	0.065	0.072	0.076	0.055	0.100	0.103	0.110	0.074
Aramco Hospitals	0.228	0.250	0.248	0.228	0.267	0.264	0.257	0.282	0.230	0.238	0.336	0.257
Private hospitals	0.121	0.125	0.083	0.104	0.064	0.071	0.069	NA	0.086	0.089	0.092	0.090
Total	1.178	1.152	1.145	1.226	1.357	1.381	1.383	1.314	1.326	1.412	1.607	1.316
Average	0.236	0.230	0.229	0.245	0.272	0.276	0.277	0.292	0.265	0.282	0.321	

Table 5: Total number of demand pharmacists.

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	Average
Ministry of health	5,739.40	5,480.00	5,279.00	5,291.40	5,273.00	5,403.00	5,504.60	5,879.00	5,821.00	5,870.40	5,653.00	5,563.07
University Hospitals	192.20	207.20	201.60	54.00	74.00	67.20	71.00	47.40	48.40	51.20	-5.60	91.69
Armed Forces Hospitals	663.80	587.20	582.40	562.80	505.00	468.00	468.00	468.00	422.60	243.40	243.40	474.05
Hospitals in the National Guard	6.80	10.40	12.40	-2.60	-40.80	-40.80	-39.20	-40.80	-19.00	-60.60	-157.40	-33.78
Hospitals, Security Forces	26.20	20.20	27.40	19.40	11.80	11.80	11.80	102.20	82.40	71.40	69.80	41.31
King Faisal specialist hospital and research	-38.80	0.60	-35.40	15.00	-65.80	-72.20	-80.60	-166.60	-52.40	-64.20	-70.20	-57.33
Royal Commission for Jubail and Yanbu	58.20	77.00	67.80	63.80	60.40	55.40	55.80	71.00	40.40	40.40	40.00	57.29
Aramco Hospitals	-11.00	-20.00	-19.00	-11.00	-21.80	-20.80	-19.20	-25.80	-11.00	-13.80	-49.80	-20.29
Private hospitals	992.00	842.20	1,299.00	1,141.60	1,747.40	1,718.60	1,852.00	NA	1,791.80	1,847.60	1,886.60	1,511.88
Total	7,628.80	7,204.80	7,415.20	7,134.40	7,543.20	7,590.20	7,824.20	9,196.40	8,124.20	7,985.80	7,609.80	7,750.64
Average	1,525.76	1,440.96	1,483.04	1,426.88	1,508.64	1,518.04	1,564.84	1,725.64	1,624.84	1,597.16	1,521.96	

Table 6: All hospital Pharmacist demand for years (2016-2030).																	
	Sector	Years															
		2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	Average
	Ministry of health	8,367.00	8,579.52	8,797.44	9,020.90	9,250.03	9,484.98	9,725.90	9,972.93	10,226.25	10,485.99	10,752.34	11,025.45	11,305.49	11,592.65	11,887.11	10,031.60
	University Hospitals	358.4	367.5	376.84	386.41	396.22	406.29	416.61	427.19	438.04	449.17	460.58	472.27	484.27	496.57	509.18	429.70
	Armed Forces Hospitals	954.4	978.64	1,003.50	1,028.99	1,055.12	1,081.92	1,109.41	1,137.58	1,166.48	1,196.11	1,226.49	1,257.64	1,289.59	1,322.34	1,355.93	1,144.28
	Hospitals in the National Guard	435.6	446.66	458.01	469.64	481.57	493.8	506.35	519.21	532.4	545.92	559.78	574	588.58	603.53	618.86	522.26
	Hospitals, Security Forces	172.8	177.19	181.69	186.3	191.04	195.89	200.86	205.97	211.2	216.56	222.06	227.7	233.49	239.42	245.5	207.18
	King Faisal specialist hospital and research	232.8	238.71	244.78	250.99	257.37	263.91	270.61	277.48	284.53	291.76	299.17	306.77	314.56	322.55	330.74	279.12
	Hospitals, the Royal Commission for Jubail and Yanbu	89	91.26	93.58	95.96	98.39	100.89	103.45	106.08	108.78	111.54	114.37	117.28	120.26	123.31	126.44	106.71
	Aramco Hospitals	73.2	75.06	76.97	78.92	80.93	82.98	85.09	87.25	89.47	91.74	94.07	96.46	98.91	101.42	104	87.76
	Private hospitals	3,485.60	3,574.13	3,664.92	3,758.01	3,853.46	3,951.34	4,051.70	4,154.61	4,260.14	4,368.35	4,479.31	4,593.08	4,709.74	4,829.37	4,952.04	4,179.05
	Total	14,168.80	14,528.67	14,897.73	15,276.12	15,664.13	16,062.00	16,469.98	16,888.30	17,317.29	17,757.14	18,208.17	18,670.65	19,144.89	19,631.16	20,129.80	16,987.66
	Average	1,574.31	1,614.30	1,655.30	1,697.35	1,740.46	1,784.67	1,830.00	1,876.48	1,924.14	1,973.02	2,023.13	2,074.52	2,127.21	2,181.24	2,236.64	1,887.52

five times more incremental than our country. ^[5,15] The question raised is how will meet those pharmacist demands at present and in the future. The appropriate solution is to implement the new vision of pharmacy practice during Saudi vision 2030, by applying for the new program Saudi Managed Care Pharmacy.

CONCLUSION

Over the past several years, there was very high demand for hospital pharmacists at MOH and private sectors. The projection of pharmacist's demand in the future is accepted across all healthcare organization. Targeting implementation of the new vision of pharmacy practice during Saudi vision 2030 is highly recommended in the kingdom of Saudi Arabia.

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CONFLICT OF INTEREST

None

ABBREVIATION USED

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

REFERENCES

- Government of Saudi Arabia. Saudi Arabia Vision 2030. 2016.
- Saudi Arabia's Vision 2030. National Transformation Program 2020. 2017.
- McLeod DC. Contrast in Pharmacy Manpower Planning between the United States and Northern European Countries. *Drug Intell Clin Pharm.* 1986;20:210-2.
- HRSA. A study of the supply and demand for pharmacists. Department of Health and Human Services. 2000;100.
- 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.
- Bond CA, Raehl CL. Clinical pharmacy services, pharmacy staffing, and adverse drug reactions in United States hospitals. *Pharmacotherapy.* 2006;26(6):735-47.
- Bond CA, Raehl CL. Clinical pharmacy services, pharmacy staffing, and hospital mortality rates. *Pharmacotherapy.* 2007;27(4):481-93.
- Hawthorne N, Anderson C. The global pharmacy workforce: a systematic review of the literature. *Hum Resour Health.* 2009;7(1):48.
- Gal D, Bates I. 2012 FIP Global Pharmacy Workforce Report. 2012. Available from: www.fip.org/humanresource
- Workforce H. Pharmacist Workforce. 2012. — Provincial / Territorial Highlights. 2012.
- Health Workforce Australia. Australia's Health Workforce Series: Pharmacists in Focus. 2014;1-47.
- 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>
- Robinson E, Shcherbakova N. Assessment of Pharmacy Manpower and Services in New England. *Journal Pharm Pract.* 2016;29(6):549-55.
- Pedersen CA, Schneider PJ, Scheckelhoff DJ. ASHP national survey of pharmacy practice in hospital settings: Dispensing and administration - 2014. *Am J Heal Pharm.* 2015;72(13):1119-37.
- Knapp DA. Professionally determined need for pharmacy services in 2020. 2002;66(4):421-9.
- Health Statistical Year Book. Saudi Ministry of Health; 2006. Available from: <http://www.moh.gov.sa/en/Ministry/Statistics/book/Pages/default.aspx>.
- Health Statistical Year Book. Saudi Ministry of Health; 2007. Available from: <http://www.moh.gov.sa/en/Ministry/Statistics/book/Pages/default.aspx>.
- Health Statistical Year Book. Saudi Ministry of Health; 2008. Available from: <http://www.moh.gov.sa/en/Ministry/Statistics/book/Pages/default.aspx>.
- Health Statistical Year Book. Saudi Ministry of Health; 2009. Available from: <http://www.moh.gov.sa/en/Ministry/Statistics/book/Pages/default.aspx>.

20. Health Statistical Year Book. Saudi Ministry of Health; 2010. Available from: <http://www.moh.gov.sa/en/Ministry/Statistics/book/Pages/default.aspx>.
21. Health Statistical Year Book. Saudi Ministry of Health; 2011. Available from: <http://www.moh.gov.sa/en/Ministry/Statistics/book/Pages/default.aspx>.
22. Health Statistical Year Book. Saudi Ministry of Health; 2012. Available from: <http://www.moh.gov.sa/en/Ministry/Statistics/book/Pages/default.aspx>.
23. Health Statistical Year Book. Saudi Ministry of Health; 2013. Available from: <http://www.moh.gov.sa/en/Ministry/Statistics/book/Pages/default.aspx>.
24. Health Statistical Year Book. Saudi Ministry of Health; 2014. Available from: <http://www.moh.gov.sa/en/Ministry/Statistics/book/Pages/default.aspx>.
25. Health Statistical Year Book. Saudi Ministry of Health; 2015. Available from: <http://www.moh.gov.sa/en/Ministry/Statistics/book/Pages/default.aspx>.
26. Health Statistical Year Book. Saudi Ministry of Health; 2016. Available from: <http://www.moh.gov.sa/en/Ministry/Statistics/book/Pages/default.aspx>.
27. American Society of Hospital Pharmacists. ASHP Statement on Pharmaceutical Care. *Am J Hosp Pharm.* 1993;50:1720-3.
28. American Society of Hospital Pharmacists. ASHP Guidelines on a Standardized Method for Pharmaceutical Care. *Am Soc Heal Pharm.* 1996;53(14):1713-6.
29. Medication Management (MM). In: National Hospital Standards. 2nd Edition. Saudi Central Board for Accreditation of Healthcare Institutions.; 2015;194-211. Available from: <http://www.cbahi.gov.sa>
30. The Joint Commission. Comprehensive Accreditation Manuals. Joint Commission Resources. 2007. Available from: <http://www.jcinc.com/store/publications/manuals/>
31. 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.
32. Ministry of Health. Achievements 2013. 1st Ed. Riyadh, Saudi Arabia. 2011;132-5.
33. National e-Health Strategy - MOH Initiatives 2030. 2017. Available from: <https://www.moh.gov.sa/en/Ministry/nehs/Pages/vision2030.aspx>

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