Pharmacy Technician Workforce in Saudi Arabia over Twelve Years (2006-2017)

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ABSTRACT

Objectives: To explore the workforce of pharmacy technician at Ministry of Health (MOH) institutions over the past twelve years (2006-2017) in the Kingdom of Saudi Arabia. Methods: It is a retrospective analysis of twelve years (2006-2017) of Ministry of Health pharmacy technician workforce at hospital practice. All data derived from the Ministry of Health Statistical Year Books and any missing appropriate information about pharmacy technician workforce, that’s will be estimated through allied healthcare professional’s data in each region including gender or nationality. It included pharmacy technician and exclude all types of pharmacists or clinical pharmacist’s workforces at MOH hospital and Primary Health Care Centers (PHCs) settings. All calculations were based on MOH workforce standards of hospitals and PHCs. All calculation was done using Microsoft Excel version ten. Results: The total number of pharmacy technician in all sectors, hospitals, primary healthcare centers and medical affairs administration increased from 4,289 to 8,373 over twelve years to 1.96-fold increments (2006-2017). The number of Saudi pharmacy technician increased from 3,064 to 8,061 to 2.63-fold increments while non-Saudi pharmacy technician decreased from 1,225 to 312 to 3.92-fold reductions. The rate of pharmacy technician to pharmacist decreased from 6.7 to 2.2 to 3.05-fold ratio reductions while the pharmacy technician per 10,000 population increased from 2.67 to 4.29 to 1.61-fold incremental ratio over the past twelve years. Conclusion: The pharmacy technician worked at the Ministry of Health institutions increased over the past twelve years. The Saudi pharmacy technician was increased with reduction of non-Saudi nationality. The male gender more than female. The ratio of pharmacy technician to pharmacist was reduced by time. The pharmacy technician workforces needed to explore at all healthcare institutions in the Kingdom of Saudi Arabia. Keywords: Pharmacy technician, Hospital, Health, Centers, Workforce, Ministry of Health, Saudi Arabia.

INTRODUCTION

The analysis, workforce of pharmacy staff is very critical in healthcare practice. That is related to detect the demand or forecasting of the pharmacy staff. Besides, to determine the Human Resources of the pharmacy department. One of the strategic goals of the pharmacy strategic plan and updated plan with vision 2030 was the pharmacy workforce, including the pharmacy technician.[1,2] The Ministry of Health released the standard of pharmacist workforce requirements in the hospitals and primary healthcare centers. [3,4] The pharmacy technician workforce standard has not existed yet. Several studies published locally for the pharmacist workforce or demand while pharmacy technician not investigated.[5-9] However, the pharmacy technician workforce discussed during the mass gatherings hajj period only.[10-13] The pharmacy technician workforce analysis at all healthcare sectors, including hospitals or primary healthcare centers or medical affairs administration, not existed. Besides, the pharmacist to pharmacy technician in the actual practice did not determine in Saudi Arabia or Gulf and Middle East countries based on the best of the author’s knowledge. The study aimed to declare the pharmacy technician workforce at all healthcare institutions of the Ministry of Health in the Kingdom of Saudi Arabia.

METHODS

It is a retrospective analysis of twelve years (2006-2017) of MOH hospitals, primary healthcare center (PHCs) and MOH administration pharmacy technician’s workforce. All data derived from the Ministry of Health Statistical Year Books and any missing appropriate information about pharmacy technician workforce, that’s will be estimated through allied healthcare professionals data at each region including gender or nationality.[13-24] It included all types of pharmacy technicians included in the study while excluded all pharmacists or clinical pharmacist’s workforces at MOH intuitions (Medical affairs and hospitals or primary healthcare centers). All pharmacy technicians expected to provide pharmaceutical according to the American Society of Health-System Pharmacist (ASHP) definition and requirements. All types of pharmacy services based on the Saudi Central Board of hospital accreditation, Joint Commission on Hospital Accreditation, ASHP best practice standards and general administration of the pharmaceutical care strategic plan.[1,2,5-26] All pharmacy technician’s works
at MOH hospitals or administration or non-MOH government hospitals and primary care centers excluded from the studies. All private hospital or community pharmacy technician excluded from the study. All calculations were based on MOH workforce standards of hospitals and PHCs. All calculation was done using Microsoft Excel version ten. The calculations were for a total twenty-one regions; the hospitals and primary health care centers, distribution numbers in each year, the annual pharmacy technician distribution numbers, the ratio of the pharmacy technician's per pharmacist, the ratio of the pharmacy technician's per populations and the gender distribution of pharmacy technician at overall Saudi Arabia.

RESULTS

The total number of pharmacy technician at all sectors, hospitals, primary healthcare centers and medical affairs administration increased from 4,289 to 8,373 over twelve years to 1.96-fold increments (2006-2017). The number of Saudi pharmacy technician increased from 3,064 to 8,061 to 2.63-fold increments while non-Saudi pharmacy technician decreased from 1,225 to 312 to 3.92-fold reductions. The number of Saudi males of pharmacy technician increase 2,887 to 7,149 over twelve years to 2.48-fold increments, while non-Saudi pharmacy technician decreased from 828 to 246 to 3.36-fold reductions. The number of Saudi males of pharmacy technician increased from 1951 to 5,652 to 2.89-fold increments, while Saudi female increase 120 to 721 to 6.00 increments over twelve years. The male gender of non-Saudi pharmacy technician decreased from 503 to 44 to 11.43-fold reductions, while non-Saudi female reduced from 325 to 202 to 1.6-fold reductions. The rate of pharmacy Technician per hospital increased 13.18 to 23.47, while the rate of pharmacy Technician per bed increased from 0.09 to 0.15. The rate of pharmacy technician to pharmacist decreased from 4.54 to 2.04 with 2.23-fold ratio reductions, while the pharmacy technician per 10,000 population increased from 1.86 to 3.39 to 1.82-fold incremental ratio over the past twelve years (Table 2).

The total number of pharmacy technician at PHCs increased from 891 to 1,623 over twelve years to 1.82-fold increments (2006-2017). The number of Saudi pharmacy technician increased from 637 to 1,562 to 2.59-fold increments, while non-Saudi pharmacy technician decreased from 254 to 61 to 4.16-fold reductions. The number of Saudi males of pharmacy technician increase 600 to 1,386 to 2.31-fold increments, while Saudi female increase 37 to 176 to 4.76 increments over twelve years. The male gender of non-Saudi pharmacy technician decreased from 154 to 11 to 14-fold reductions, while non-Saudi female reduced from 100 to 50 to 2-fold reductions. The rate of pharmacy Technician per PHCs increased 0.46 to 0.69, while the rate of pharmacy technician to pharmacist decreased from 11.46 to 3.47 to 3.34-fold ratio reductions, while the pharmacy technician per 10,000 population increased from 0.63 to 0.83 to 1.32 fold incremental ratio over the past twelve years (Table 3).

DISCUSSION

The pharmacy technician works at three kinds of places in hospitals, primary healthcare centers and medical affairs administration. Each sector had a specific job description accordingly. The findings of the study showed that the total number of pharmacy technician works at all types of sectors increased over twelve years, with a binary number with increased 0.16-fold annually. It is difficult to judge the increments number demand due to the standard of pharmacy technician requirements has not existed. Also, the workload of a pharmacy technician was not reported in the annual MOH statistical book. The findings showed there was increased with Saudi phar-

Tabel 1: Total Pharmacy Technicians general workforce’s descriptions (Hospitals-PHCs-Medical Admin.)

<table>
<thead>
<tr>
<th>Year</th>
<th>Total Population</th>
<th>MOH-serving populations</th>
<th>Saudi pharmacy Technical</th>
<th>non-Saudi pharmacy technical</th>
<th>total male</th>
<th>female</th>
<th>total</th>
<th>total female</th>
<th>total male</th>
<th>female</th>
<th>total</th>
<th>No of pharmacist</th>
<th>Rate per 10,000 population</th>
</tr>
</thead>
<tbody>
<tr>
<td>2006</td>
<td>23,678,849.00</td>
<td>14,207,309.40</td>
<td>2,887</td>
<td>177</td>
<td>3,064</td>
<td>744</td>
<td>1,225</td>
<td>481</td>
<td>3,631</td>
<td>658</td>
<td>4,289</td>
<td>636</td>
<td>6.7</td>
</tr>
<tr>
<td>2007</td>
<td>24,242,578.00</td>
<td>14,545,546.80</td>
<td>2,886</td>
<td>217</td>
<td>3,103</td>
<td>440</td>
<td>898</td>
<td>458</td>
<td>3,326</td>
<td>675</td>
<td>4,001</td>
<td>804</td>
<td>5.0</td>
</tr>
<tr>
<td>2008</td>
<td>24,807,273.00</td>
<td>14,884,363.80</td>
<td>3,023</td>
<td>222</td>
<td>3,245</td>
<td>331</td>
<td>724</td>
<td>393</td>
<td>3,354</td>
<td>615</td>
<td>3,969</td>
<td>1,065</td>
<td>3.7</td>
</tr>
<tr>
<td>2009</td>
<td>25,373,512.00</td>
<td>15,224,107.20</td>
<td>3,485</td>
<td>386</td>
<td>3,871</td>
<td>105</td>
<td>442</td>
<td>337</td>
<td>3,590</td>
<td>723</td>
<td>4,313</td>
<td>1,364</td>
<td>3.2</td>
</tr>
<tr>
<td>2010</td>
<td>27,136,977.00</td>
<td>16,282,186.20</td>
<td>4,724</td>
<td>532</td>
<td>5,256</td>
<td>91</td>
<td>444</td>
<td>353</td>
<td>4,815</td>
<td>885</td>
<td>5,700</td>
<td>1,601</td>
<td>3.6</td>
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<tr>
<td>2011</td>
<td>28,376,355.00</td>
<td>17,025,813.00</td>
<td>5,276</td>
<td>570</td>
<td>5,846</td>
<td>112</td>
<td>524</td>
<td>412</td>
<td>5,388</td>
<td>982</td>
<td>6,370</td>
<td>1,487</td>
<td>4.3</td>
</tr>
<tr>
<td>2012</td>
<td>29,204,842.00</td>
<td>17,522,905.20</td>
<td>5,457</td>
<td>813</td>
<td>6,270</td>
<td>73</td>
<td>267</td>
<td>349</td>
<td>5,530</td>
<td>1,089</td>
<td>6,619</td>
<td>1,661</td>
<td>4.0</td>
</tr>
<tr>
<td>2013</td>
<td>29,994,272.00</td>
<td>17,996,563.20</td>
<td>5,338</td>
<td>805</td>
<td>6,143</td>
<td>113</td>
<td>362</td>
<td>475</td>
<td>5,451</td>
<td>1,167</td>
<td>6,618</td>
<td>1,915</td>
<td>3.5</td>
</tr>
<tr>
<td>2014</td>
<td>30,770,375.00</td>
<td>18,462,225.00</td>
<td>7,259</td>
<td>796</td>
<td>8,055</td>
<td>51</td>
<td>242</td>
<td>293</td>
<td>7,310</td>
<td>1,038</td>
<td>8,348</td>
<td>2,239</td>
<td>3.7</td>
</tr>
<tr>
<td>2015</td>
<td>31,521,418.00</td>
<td>18,912,850.80</td>
<td>7,307</td>
<td>889</td>
<td>8,196</td>
<td>46</td>
<td>229</td>
<td>275</td>
<td>7,533</td>
<td>1,118</td>
<td>8,471</td>
<td>2,389</td>
<td>3.5</td>
</tr>
<tr>
<td>2016</td>
<td>31,742,308.00</td>
<td>19,045,384.80</td>
<td>7,263</td>
<td>904</td>
<td>8,167</td>
<td>49</td>
<td>236</td>
<td>285</td>
<td>7,312</td>
<td>1,140</td>
<td>8,452</td>
<td>2,714</td>
<td>3.1</td>
</tr>
<tr>
<td>2017</td>
<td>32,552,336.00</td>
<td>19,531,402.00</td>
<td>7,149</td>
<td>912</td>
<td>8,061</td>
<td>56</td>
<td>256</td>
<td>312</td>
<td>7,205</td>
<td>1,168</td>
<td>8,373</td>
<td>3,853</td>
<td>2.2</td>
</tr>
</tbody>
</table>
macy technician with increased 0.219-fold increments and at the same time, there were reductions with non-Saudi pharmacy technician with 0.326-fold reductions. The reductions of a pharmacy technician were faster than increments of pharmacy technician as replacements by 1.48-fold. That mean there will be a shortage of pharmacy technician at such point of time. In the comparison of both genders, the male Saudi pharmacy technician increased by 0.2-fold annually, while reductions of non-Saudi male with 1.1-fold. It was almost 5.5 times faster in the replacements. The possibility of a male pharmacy technician will be high. In the other word, the Saudi female pharmacy technician by 0.429-fold increased annually, while the non-Saudi female technician decreased by 0.156-fold annually. The replacements of Saudi female pharmacy technician with the Saudization program were faster than non-Saudi female pharmacy technician by 2.75-fold increments. As results, it possible to have over a staff of female pharmacy technician. The findings showed the ratio of a pharmacy technician
to pharmacy reduced annually by 0.254-fold. That is related maybe to increase the number of a pharmacist at primary healthcare centers without keeping consideration of constant ratio. However, still the ratio within a range and similar to the previous studies. There are increased of pharmacy technician per Saudi populations and that has expected because of double increments of pharmacy technician.

The findings showed the rate of replacements of a hospital pharmacy technician with Saudi nationality by non-Saudi almost the same. That is good to prevent over or under the staff of the pharmacy technician. However, the Saudi male pharmacy technician increased to 0.24-fold annually, while the reductions in the non-Saudi male pharmacy technician with 0.519 and the subsequent possibility of a shortage of male pharmacy technician in the hospitals. Regarding the Saudi female, pharmacy technician increased quickly while the reductions of non-Saudi female pharmacy technician workforce in past eleven years (2006-2016) and forecasting future fifteen years (2016-2030) at ministry of health in Saudi Arabia. J Pharm Pract Community Med. 2018;4(1s):S115-20.

The findings of the study showed that is the number of Saudi pharmacies work at primary healthcare centers increased by 0.215-fold annually, while reductions in the non-Saudi Pharmacy Technician to 0.346-fold annually. As results, the replacements of a Saudi pharmacy technician are high and possible of other staff. The Saudi male pharmacy technician of PHCs replacements is lower than hospital by a non-Saudi male pharmacy technician and possibly a shortage of pharmacy will be high. Besides, the Saudi female pharmacy technician replacements almost equal to hospital female pharmacy technician. The ratio of a pharmacy technician to the pharmacist at primary healthcare centers was higher than pharmacist that’s related to a low number of pharmacists at primary healthcare centers. The ration of pharmacy technician per populations of PHCs is lower than hospital that’s due lower number of pharmacy technician works at PHCs.

CONCLUSION
The current study was the first done in Saudi Arabia and Gulf or Middle East countries. The pharmacy workforces over the past twelve years doubled with cumulative increased of Saudi nationality and both genders. The ration of pharmacy technician to pharmacist decreased with time and should be standardized by the healthcare sector. Further study is required to declare in depth detail of pharmacy technician at all governmental and private healthcare organizations in the kingdom of Saudi Arabia.

ACKNOWLEDGEMENT
None

CONFLICT OF INTEREST
The authors declare that there are no conflicts of interest.

ABBREVIATIONS
KSA: Kingdom of Saudi Arabia; MOH: Ministry of Health; ASHP: American Society of Health-System Pharmacist; PHCs: Primary Healthcare Centers.

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