



## Pharmacy practice and its challenges in Yemen

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### RESEARCH

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### Abstract

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#### Background

Pharmacy practice in Yemen was established in 1875 in Aden.

#### Objectives

To describe pharmacy practice as it currently exists in Yemen, the challenges the profession faces, and to recommend changes that will improve pharmaceutical care services.

#### Methods

This study has two parts. Part 1 comprised a literature search performed between May and July 2011 to identify published studies on pharmacy practice in Yemen. Full text papers, abstracts, and reports in Arabic or English between 1970 and 2011 were reviewed. Part 2 consisted of a qualitative study with face-to-face interviews with a representative sample of pharmacists, staff from the Ministry of Public Health and Population (MoPHP), and patients.

#### Results

The analysis revealed several issues that plague pharmacy practice in Yemen:

1. Fewer than 10 per cent of pharmacists working in pharmacies and drug stores are graduates of government-recognised colleges.
2. Most Yemeni pharmacists are dissatisfied with their work conditions and opportunities.
3. Medicines are expensive and hard to access in Yemen, and counterfeit medicines are a serious problem.
4. Few regulations and standards exist for pharmacists and pharmaceutical care.
5. Pharmaceutical marketing plays an important role in marketing and selling products in Yemen.

6. A dearth of standards, regulations, and laws are hurting pharmacy practice in the country and potentially endangering peoples' lives.

#### Conclusion

In order to improve pharmacy practice in Yemen, many changes are needed, including updating the pharmacy curriculum taught, implementing industry standards for pharmacy practice, implementing and reinforcing laws, and integrating pharmacists more fully in the healthcare industry. Additionally, the quality of the pharmacy workforce needs to be improved, and there needs to be increased awareness by the public, physicians, other healthcare professionals, and policy makers about the value of pharmacists.

#### Key Words

Pharmacy practice, workforce, satisfaction, challenges, recommendations and Yemen.

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#### What this study adds:

##### 1. What is known about this subject?

Many studies have been conducted worldwide to explore pharmacy practice in developing countries and existing challenges. This study focuses specifically on pharmacy practice in Yemen.

##### 2. What new information is offered in this study?

This study is the first of its kind in Yemen to describe many aspects of pharmacy practice and existing challenges the profession and industry face.

##### 3. What are the implications for research, policy, or practice?

This study highlights the challenges of Yemeni pharmacy practice and recommends solutions to them. This study can help improve pharmacy practice in Yemen: policy makers can use it to develop a strategy to raise standards and quality.

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#### Introduction

Yemen is situated in the southwest corner of the Arabian Peninsula with a population of approximately 24 million.<sup>1</sup> It is among the least developed countries in the world. Yemen's health situation is considered the worst in the region: it has high rates of mortality and malnutrition; it



has high infant mortality of 75 per 1,000 lives births; and it has an under age 5 mortality of 96 per 1,000 lives births. Total expenditure on health per capita (US\$) is 122 and total expenditure on health as a percentage of GDP is 5.2.<sup>2</sup> Table 1 shows the health indicators in Yemen.<sup>2-5</sup>

**Table 1: Health indicators in Yemen**

	2011	2010	2009	2008
Population size	23,832,569	23,153,982	22,492,035	21,843,554
Number of physicians	6,469	6,599	6,468	6,226
Number of dentists	572	573	587	535
Number of inhabitants per physician	3,684	3,509	3,477	3,508
Number of nurses	12,685	12,785	12,211	11,845
Number of nurses per physician	2	2	2	2
Number of beds	16,695	16,534	16,095	15,184
Number of inhabitants per bed	1,428	1,400	1,397	1,439

Source: Ministry of Public Health and Population<sup>2-5</sup>

### Health sector in Yemen

Yemen’s health system consists of a public and a private sector. The public health sector is organised into three levels:

1. Primary health care focuses mainly on primary health programs and provides the first level of care. Primary healthcare centres generally have 1–2 doctors, nurses, a laboratory, and X-ray facilities. Patients generally pay for their medicines from outside pharmacies because the primary healthcare centres do not have a pharmacy.
2. Secondary health facilities are the regional hospitals, which are more specialised in curative services. There is at least one hospital in each of Yemen’s 21 provinces.<sup>1</sup>
3. Tertiary health facilities are the national hospitals providing specialised care; they are considered university-based hospitals.<sup>2-5</sup>

Generally, the Ministry of Public Health and Population (MoPHP) is responsible for the health sector and is one of Yemen’s largest public employers. Yemen’s health system suffers from shortcomings in construction and organisation, insufficient numbers of staff, low quality health care, shortage of essential medicines, and a dearth of government funding.<sup>6,7</sup>

Historical records show that the first pharmacy in Yemen was opened in 1875 in Aden, and the second pharmacy opened in 1876.<sup>8</sup> In 2010, the first chain pharmacies were established in the capital Sana'a. Since then many chain pharmacies have been established in Sana'a and other cities.

### Methods

This study consists of two parts.

**Part 1:** A literature search was performed from May to July 2011 to identify published studies on pharmacy practice in Yemen. Full text papers, abstracts, and reports in Arabic or English between 1970 and 2011 were reviewed. The search strategy involved using the following keywords: pharmacy practice, challenges, community pharmacy, hospital pharmacy, pharmaceutical industry, pharmaceutical marketing, counterfeit medicines, dispensing, clinical pharmacy, pharmaceutical care, and Yemen. The author manually screened the titles, abstracts, and full texts generated using this search strategy. The references of the retrieved articles were manually searched for additional relevant references. Electronic databases searched included The Supreme Board of Drugs and Medical Appliances (SBDMA) website, the Ministry of Public Health and Population (MoPHP) website, Google Scholar, Science Direct, MEDLINE, and Springer Link.

**Part 2:** A qualitative study consisting of face-to-face interviews was done. Participants included pharmacists, medical representatives, staff from the Ministry of Public Health and Population, and patients. In total, 13 pharmacists, 6 medical representatives, 3 staff from the MOPHP, and 8 patients were interviewed. Snowball sampling was used in this study. A semi-structured interview guide (Appendix A) was developed and used during the interview process after an extensive review of the literature on similar studies conducted elsewhere. The author manually analysed then summarised all transcripts.

**Definition:** Pharmacy practice in this research is defined as the practice of pharmacy in community pharmacies, drug stores, hospitals, and pharmaceutical industries, and also includes pharmaceutical marketing and issues related to medicines.

### Ethical Approval

This study was approved by the College of Pharmacy, Qassim University. Verbal consent was taken from the respondents. No personal information of the respondents was obtained.

### Results

The following section presents information regarding Yemen’s pharmaceutical industry and pharmacies; pharmacy training; licensure of pharmacy professionals; job opportunities and satisfaction; availability of



medicines and the problem of counterfeit medicines; and how medication is dispensed.

### **Pharmaceutical industry and pharmacies**

The Yemen Drug Company (YEDCO) was set up in 1964 by the Yemeni government in cooperation with private investors. It was established as a company specialised in the marketing of medicinal drugs. YEDCO initiated its work by importing drugs from foreign companies and then marketing and distributing them locally. In 1982, YEDCO established the first medicinal factory for drugs in Sana'a. Today YEDCO produces more than 60 medicinal products.<sup>9</sup> In 1993, ShibaPharma, the second pharmaceutical company, was established in Sana'a. More than 134 ShibaPharma products have been approved and sold in Yemen and are exported to countries in the Middle East and Africa.<sup>10</sup> Currently, there are nine local pharmaceutical industries in Yemen.

The local pharmaceutical industry covers approximately 10–20 per cent of the total market. Yemen is a member of the Arab Union of the Manufacturers of Pharmaceuticals and Medical Appliances, and ranks 11<sup>th</sup> among Arabic countries in medicine production. Yemen spends about US\$263 million a year on pharmaceutical drugs, according to the national Supreme Drugs Authority. Most of this expenditure is spent on importing medicines from 50 countries through 400 importers, as local pharmaceutical plants produce only 10–20 per cent of Yemen's requirements.<sup>11-13</sup>

There are about 500 foreign pharmaceutical companies and more than 13,000 brand medicines registered in Yemen.<sup>16</sup> But in 2012, the Ministry of Public Health and Population and the Supreme Board of Drugs and Medical Appliances (SBDMA) started a new policy to ensure the quality of medicines in Yemen. The policy stipulates that to renew the registration of medicines currently marketed or to register new medicines in Yemen, companies must first register with the executive boards of the Health Ministers Council for GCC states or the Gulf Central Committee for Drug Registration, or register the drugs in the USA; otherwise registration would be cancelled. This policy should decrease the number of registered companies and number of registered medicines.<sup>12,13</sup>

The Supreme Board of Drugs and Medical Appliances and the Ministry of Public Health and Population are responsible for the regulation of pharmacy practice, registration, and drug procurement. In 2011, there were 3,315 pharmacies (licenced for pharmacists) and 4,133 drug stores (licenced for pharmacy technicians).<sup>11</sup> Most pharmacies are not owned by qualified pharmacists, and most do not have access to any information resources, not even the Internet. A few pharmacies use old versions of the BNF (British National Formulary) or the Middle

East Medical Index. The poor quality and out-of-date drug information resources in pharmacies affect the quality of information provided to patients and prescribers.

### **Pharmacy training**

Yemen has four public and 12 private pharmacy colleges; however, only four public colleges and three private colleges, respectively, are recognised by the government.<sup>14</sup> The first public pharmacy faculty (college) was established in 1987 in Sana'a, initially as a department in the Faculty of Medicine and Health Sciences, University of Sana'a. The first students graduated in 1993. In 2002, it became a separate faculty.

The second public pharmacy college was established in 1995 in Aden, initially as a department in the Faculty of Medicine and Health Sciences, University of Aden. In June 2009, it became a separate college.<sup>14</sup> The third public pharmacy faculty (college) was established in 2005 in Tamar as a department in the Faculty of Medicine and Health Sciences, University of Tamar.<sup>14</sup> The fourth public pharmacy faculty (college) was established in 2011 in Hodeidah University. It is a department of Clinical Pharmacy in the Faculty of Medical Sciences, and offers two programs: pharmacy and the doctor of pharmacy (PharmD).<sup>14</sup>

The three private colleges of pharmacy offer a diploma of pharmacy as well as a bachelor's degree in pharmacy. The University of Science and Technology established the first private college of pharmacy as a department within the College of Medical Sciences. It offers a diploma of pharmacy and bachelor of pharmacy; however, in 2010–2011 it began to offer a PharmD program.<sup>14</sup> Table 2 lists the recognised institutions and degrees offered.

The diploma of pharmacy is two to three years. A bachelor's degree program in all public and private colleges is five years. A master's program is three years. The program is taught in English, with Arabic used in a few courses of Arabic and Islamic subjects. Recipients of the Bachelor of Pharmacy or Pharmaceutical Sciences can study one year more and earn a Doctor of Pharmacy (Bachelor).<sup>14</sup>



**Table 2: Pharmacy programs accredited by the Yemeni government<sup>14</sup>**

Pharmacy Program	Degrees Offered
<b>Public</b>	
Faculty of Pharmacy, Sana'a University	Bachelor's and Master's in pharmacology, pharmaceuticals and pharmacognosy; Master's and PhD in pharmacology and public health (under supervision of Faculty of Medicine and Health Sciences)
Faculty of Pharmacy, Aden University	Bachelor degree of pharmaceutical sciences
Faculty of Pharmacy, Thamar University	Bachelor degree of pharmaceutical sciences
Dept. of Clinical Pharmacy, Faculty of Medical Sciences, Hodeidah University	Bachelor of pharmacy and doctor of pharmacy degree
<b>Private</b>	
College of Pharmacy, University of Science and Technology	Diploma of pharmacy, Bachelor's of pharmacy, and doctor of pharmacy degree
Queen Arwa University	Diploma of pharmacy and Bachelor's of pharmacy
Dar Alsalam International University for Science & Technology	Diploma of pharmacy and Bachelor's of pharmacy

**Classification and licensure of pharmacy professionals**

The Ministry of Health and Medical Council classifies pharmacy professionals as: technician (diploma holders), pharmacist (bachelor's degree holders), specialist (master's degree holders), and consultant (PhD holders).<sup>15</sup> A licensure examination is not required for pharmacy practice in Yemen; a diploma will suffice to practice. Only 10 per cent of pharmacists working in pharmacies and drug stores have graduated from government-approved colleges.<sup>16</sup> The qualifications of 90 per cent of those working are unrecognised (either non-pharmacists or graduated from unrecognised colleges).<sup>16</sup> Furthermore, there is no regulation that requires pharmacists in Yemen to pursue additional training after graduation, nor is continuing education openly encouraged. Moreover, there is no continuous professional pharmacy program in any of Yemen's pharmacy colleges.<sup>17</sup>

**Job opportunities and satisfaction of community pharmacists**

Pharmacists in Yemen can work as community and hospital pharmacists, industry pharmacists, medical representatives, teaching assistants, and lecturers in the private colleges. However, many Yemeni pharmacists have migrated elsewhere to the Kingdom of Saudi Arabia, the United Arab Emirates, and other countries due to a lack of jobs and low salaries in

Yemen, and more attractive work environments outside the country.<sup>14,16</sup>

Pharmacists in Yemen work 8–12 hours daily, six days per week. Most pharmacies close on Friday.

Most pharmacists practising in Yemen are dissatisfied with their work. Reasons for dissatisfaction include low salary, lack of jobs, absence of regulation of the pharmacist's job, and the huge number of pharmacists and technicians graduating from unrecognised colleges.

**Distribution of medicines**

Local and foreign pharmaceutical industries distribute medicines in two ways: directly to the pharmacies and drug stores through their supply offices in each city in Yemen; and through subagents who distribute the medicines to the pharmacies and drug stores. Pharmaceutical marketing plays an important role in the pharmaceutical industry. Each company hires a medical representative to visit hospitals, clinics, pharmacies, drug stores, and physicians to market their products. Physicians receive brochures, free medical samples, commissions, televisions, mobile phones, free tickets, foods, money to cover conference fees, percentages of total sales, and other gifts to prescribe their products.

**Access to medicine**

Despite the presence of drug companies in Yemen, availability and affordability of medicines is a major concern. Most Yemenis make huge sacrifices to buy the necessary medicines for their health. Public sector access is poor compared to availability of medicines in the private sector. Lower-priced generics are relatively affordable compared to original brands. Compared with international reference prices, the lowest-priced generic medicines available in the private sector vary from very cheap to expensive. Most brand name drugs are priced much higher than the reference prices (75 per cent had a median price ratio (MPR) > 7). The price components of medicine in Yemen consist of: wholesale mark-up, retail mark-up, taxes, storage and transportation, custom duty, drug support fund, bank charges and CIF (cost, insurance, freight).<sup>6,7</sup>

**Counterfeit medicines**

Counterfeit medicines are a serious problem. Reports about the percentage of counterfeit medicines in Yemen differ widely. The Ministry of Public Health and Population and the Supreme Board of Drugs and Medical Appliances report that it is not more than 10 per cent.<sup>12,13</sup>



However, other reports mention that the percentage is about 60 per cent.<sup>16</sup> The problem stems from the fact that Yemen's pharmaceutical industry cannot meet the country's needs.<sup>11,13</sup> There are many reasons for the rise of counterfeit medicines in Yemen:

1. Some pharmacies in Yemen do not buy medicines from their original manufacturers.
2. Poverty pushes patients towards cheaper counterfeit medicines.
3. There is a lack of awareness regarding the risks of buying counterfeit medicines.
4. There is little monitoring and punishment of pharmacies selling counterfeit medicines.
5. Many original medicines available in Yemen are very expensive compared with the same medicines in neighbouring countries such as Saudi Arabia.<sup>16</sup>

### Dispensing of medications

Drugs, except over-the-counter (OTC) medicines, should be dispensed by prescription only. Drug dispensers in Yemen do not adhere to this important principle. The dispensing of medications without a valid prescription in Yemen is a serious problem that is affecting people's health as well as health resources. Patients in Yemen can go to the pharmacy and buy whatever they need without prescriptions, including analgesics, antibiotics, antipsychotic drugs, cardiovascular drugs, and others. Most dispensers are not pharmacists and they do not know the negative impacts of these medications on people's health. Dispensers in Yemen consider themselves doctors or more knowledgeable than physicians; people also call them doctors. Dispensers diagnose, prescribe, and dispense the medicines to treat many diseases even though they lack knowledge and authority.

Several factors have contributed to this problem. Most Yemenis do not go to physicians because that they cannot afford the treatment in private hospitals or clinics, and generally there is no medical insurance. Unfortunately, the government hospitals and medical centres are the worst in the country. Also, care in these facilities is reserved for a patient who has a relative in the hospital or is affiliated with influential people. Further, patients are required to buy everything from the papers used to write prescriptions to the medicines. People are also unaware of the dangers of buying prescription medicines without a valid prescription. The Ministry of Public Health and Population and the Supreme Board of Drugs and Medical Appliances fail to regulate, control, and monitor the prescriptions. No policy exists requiring dispensers to be qualified and registered as pharmacists. Anyone with money in Yemen can open a pharmacy by renting a licence from a pharmacist and hiring non-qualified pharmacists to work in the pharmacy.

### Discussion

Over the last four decades, the pharmacy profession has witnessed great practice changes, and moved away from its original focus on medicine supply and dispensing towards a focus on patient care especially after the introduction of clinical pharmacy concepts in the late 1960s, followed by the philosophy of pharmaceutical care in the early 1990s. The introduction of these concepts in pharmacy practice has transformed the pharmacist's role to focus more on patient-oriented services rather than the traditional focus on product and dispensing services. The pharmacist's role has evolved from that of a compounder and supplier of pharmaceutical products towards that of a provider of services and information, and ultimately that of a provider of patient care. Increasingly, the pharmacist's task is to ensure that a patient's drug therapy is appropriately indicated, the most effective available, the safest possible, and convenient for the patient for the purpose of achieving definite outcomes that improve a patient's quality of life.<sup>18,19</sup>

Pharmacists should move from behind the counter and start serving the public by providing care instead of pills only. There is no future in the mere act of dispensing. That activity can and will be taken over by the Internet, machines, and/or hardly trained technicians. The fact that pharmacists have an academic training and act as healthcare professionals puts a burden upon them to better serve the community than they currently do.<sup>28</sup>

Pharmacy practice in Yemen faces major challenges to developing and improving its services. The following list summarises the major challenges to pharmacy practice in Yemen and what can be done to address them:

1. The pharmacy curriculum in Yemeni universities is outdated; it needs to be updated to meet the requirements of working in public health services, pharmaceutical care services, and clinical pharmacy services.
2. Community pharmacies and drug stores in Yemen are still focused on dispensing and selling medicines and non-pharmacological products. Community pharmacists need to be educated about their new roles in the pharmaceutical, public, and clinical services, rather than simply dispensing.
3. Physicians, nurses, other healthcare professionals, and the public need to be educated about the new roles of the pharmacists in providing pharmaceutical care, public, and clinical services.





4. Many issues need to be solved for Yemen to develop a hospital pharmacy sector. There is a lack of clinical pharmacists in hospitals as the Ministry of Public Health and Population hires few pharmacists in their hospitals and clinical centres when compared to job vacancies for physicians and others. The pharmacies in most hospitals are either not available or they have few medicines available. So, there is a need to establish a pharmacy in each hospital in Yemen, which will create job vacancies for pharmacists. Moreover, a law should be enacted and regulations made that lead to the acceptance of the new role of the pharmacist in the hospitals to provide pharmaceutical care and clinical pharmacy services.

5. Increased public awareness is required about the importance of treatment and diagnosis by authorised physicians, rather than relying on unqualified staff at pharmacies and drug stores to diagnose and prescribe treatment. Taking medicines without identifying the real problems can lead to serious adverse effects on people's health.

6. Counterfeit medicines in Yemen are a major problem. Steps need to be taken to increase awareness on the part of pharmacists, healthcare professionals, and the public about the dangers and potentially bad outcomes from using these counterfeit medicines.

7. There is a need to conduct further research about the various issues facing pharmacy practice in Yemen, and this requires support from the policy makers and universities so researchers can conduct studies.

8. The increase in pharmacies and drug stores operated by unqualified persons in the last five years has created a major challenge for the development of legitimate pharmacy practice in Yemen. Steps must be taken to address this problem.

9. More private colleges and institutions of pharmacy are offering a bachelor degree of pharmacy without official recognition from the Ministry of Higher Education and Scientific Research. The large number of pharmacists graduating from those colleges undermines pharmacy practice in Yemen. Greater regulation of pharmacy colleges is needed to curtail the number of unaccredited pharmacy colleges and graduates.

10. There is an urgent need for laws and regulations that require pharmacy and drug store owners to hire qualified and registered pharmacists, as these professionals are the only ones that have the right to legally dispense medications. And there is a need to implement and enforce penalties to punish those who not follow these laws and regulations.

11. There is a need for a registration exam to ensure the quality of the working pharmacists in Yemen; the exam should be theoretical and practical.

12. There is a need for collaboration between the official pharmacy colleges and the Ministry of Public Health and Population to develop a policy requiring pharmacists to attend yearly Continuous Medical Education (CME) courses, as it is very important that pharmacists update their knowledge of pharmacy practice and other issues.

## Conclusion

This is the first study describing pharmacy practice and its challenges in Yemen. Pharmacy practice in Yemen is still in its infancy and it faces major hurdles. Many developments are needed, including: updating the pharmacy curriculum; updating, implementing and enforcing the pharmacist law; developing a standard for patient pharmaceutical care services and the quality of the pharmacy workforce; and increased awareness by the public, physicians, other healthcare professionals, and policy makers about the value of pharmacists. The author hopes pharmacy practice in Yemen will improve in the near future and pharmacists take seriously their new role in providing pharmaceutical care and clinical pharmacy services.

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## PEER REVIEW

Not commissioned. Externally peer reviewed.

## Appendix A

### Interview guide

#### Medical preventatives interview guide

What are the promotion techniques used in your work?

#### Pharmacists' interview guide

1. Workforce issues.
  - Days.
  - Hours.
2. Drug information resources.
3. Job satisfaction
  - Are you satisfied with your job?
  - Reasons of dissatisfaction.
4. Dispensing of medications
  - Types of dispensing.
  - Types of dispensing without prescriptions.
  - Reasons for dispensing without prescription.
  - Do you think that you have the right to diagnose, prescribe, dispense, and treat diseases?

#### Patients interview guide

Why are you seeking the treatment of your disease at a pharmacy and not going to the doctors?

#### Staff of the Ministry of Public Health and Population interview guide

Who can open a pharmacy?

Why are people seeking the treatment for their diseases at the community pharmacies?