

# Extending the Role of Pharmacists in Patient Care: Are Pharmacists in Developing Nations Ready to Change?

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## Abstract

Patient care in a community is becoming critical due to change in the impact of diseases on health. The provision of pharmaceutical care in a community will bring in positive changes in health care delivery. However, the pharmacist in developing countries has remained obscure in direct health-care of the patient. The main aim of this article is to reinforce the concept that there is a need to strengthen the basic pharmaceutical system in the Arab and African world before implementing any advanced clinical pharmacy or pharmaceutical care services to our communities. This article gives a good insight of where pharmacy practice in Arab, African and other developing countries globally stand in comparison to developed nations. A trend is apparent towards increased emphasis on clinical pharmacy practice. Country-specific pharmacy education and practice are discussed, analyzing the progress and opportunities available to pharmacy graduates. In addition, the future of pharmacy practice and clinical roles of hospital and community pharmacists were reviewed. It was realized that pharmacy practice and progress in many of the Arab and African countries were a mirror image of the status of the country itself. A new vision for the future of pharmacy practice needs to be considered and reorientation of pharmacy services in the existing system is needed. There should be a professional approach to speed up the rise towards practicing clinical pharmacy and pharmaceutical profession. This is achieved by interviewing patients, documenting their health details and educating them on methods of improving their health, including proper medication usage and lifestyle modification. Furthermore, colleges of pharmacy need to revise and update their curricula to accommodate the progressively increasing development in the pharmaceutical education and the evolving new roles of practicing pharmacists in their community.

## Keywords

Role of Pharmacist, Patient Care, Developing Countries, Pharmacy Education, Pharmacy Practice

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## 1. Introduction

Primary health care concerns, public health (disease prevention and health promotion) as well as treating those who are ill are increasingly receiving the attention of many healthcare providers, including pharmacists. Today more than ever, it is widely recognized that traditional healthcare providers are limited in how they can positively contribute towards improving the quality of services that patients receive in any given community [1]. In a majority of the Arab countries, the health care system is still evolving and the predominantly governmental facilities offer their services to all citizens. However, in the secondary care sector the majority of patients obtain their medication from the growing number of private community pharmacies. Although pharmacy practice has shown some improvement over the last 15 years [2], the public trust and indeed that of health professionals has yet to be fully won. This seems to be due to several reasons, including the public and the health professional's perception of pharmacists as lacking in professionalism, commercial pressure on community pharmacies, and a lack of enforcement of the regulations governing pharmacy practice within both the community and hospitals [2] [3]. The changes in pharmacy education across the Arab world have been dramatic and relatively rapid with a strong desire to advance the science and practice of pharmacy in most countries [4]. In African nations, pharmacy education and practice are similarly updated as their Arab counterparts in the African continent. Interestingly a study comparing community pharmacy practice in United States (a developed nation) as compared to Kenya (a developing country), reflected major differences in the daily practice [5]. In Kenya, as in many African countries, the practice is economically driven with paper documented patient data, controlled prescriptions that could be obtained by bending the rules, with the most common over the counter drug (OTC) found to be antibiotics, and practice mostly geared towards dispensing and drug information; mode of payment being cash sales. However, in the United States it was found that community practice was more focused on patient counseling in addition to dispensing, with payments mainly co-insurance based, patient profile tracking is automated; with the most common OTC drug found to be pain killers, and controlled medicines being strictly prescriptions, with any change in prescription orders needing physician consultation. In addition, medical histories are available electronically [5]. This provides a good insight of where pharmacy practice in Arab, African, and other developing countries globally stand in comparison to developed nations.

Generally speaking, nowadays, there is extensive accessibility of pharmacists during the day, and consultation can be obtained without appointment or charge [6]; moreover regulatory changes in many of these countries are increasing the scope and number of medicines, directly available without a prescription; along with increasing the role of pharmacists in patient counseling and monitoring [7]-[10]. One can speculate that the interest in increasing and expanding a pharmacist's role in any locality is huge. In spite of the growing interest that pharmacists in developing nations show towards more professional and extended practice roles, are pharmacists in the Middle East and Africa ready to extend their role? The main aim of this article is to reinforce the concept that there is a need to strengthen the basic pharmaceutical system in the Arab and African world before implementing any advanced clinical pharmacy or pharmaceutical care services to our communities.

## 2. Pharmacy Education

Pharmacy education, as well as practice, varies significantly globally. Interestingly, the number of pharmacy schools, admission requirements, and degrees offered, study duration, and the language of instruction vary markedly from one country to another as described extensively in one research paper [4]. Furthermore, nations in the Middle East and Africa have to face many of same challenges in pharmacy education as other countries outside the region. Due to a number of reasons, like inter-school competition, pressure from government agencies, health authorities, professional and student demand, in addition to the expanding role of pharmacists; some schools are now seeking international review and accreditation. In preparation for this, many schools have undertaken intensive internal review and are revamping many components of their program. On a curricular level, pharmacy schools are revising their curriculums to involve greater focus on patient care skills and more structured experiential training. The recent expansion in Arab and African pharmacy colleges and degree programs offered is obvious where a trend is apparent towards increased emphasis on clinical and pharmacy practice in the curriculum to prepare graduates for the delivery of competent patient care. The Doctor of Pharmacy (PharmD) degree program, previously uncommon, is beginning to emerge in a few Arab countries with some concern regarding the absence of accreditation; a similar trend is noticeable in African nations [4] [11]. Encouragingly, the number of opportunities for students wishing to pursue a career in pharmacy is improving.

### 3. Pharmacy Education and Practice Overview

#### 3.1. Middle East and Africa

##### 3.1.1. Libya

Libya has a population of around 5.5 million people [12]. However there is a major shortage of medical staff such as pharmacists, specialist physicians, medical technicians and other health workers [12]. Medical sciences education has expanded massively in recent years, placing enormous pressure on its already scarce resources, which may lead to a decline in quality [13]. There are 6 pharmacy schools in Libya at present. The first college of pharmacy was established in Tripoli University, Tripoli, Libya, in 1975, offering a bachelor's degree in pharmacy as well as a master's degree in pharmaceutical sciences. Admission to pharmacy faculty is based upon secondary school performance; there is a pre-requisite of a one year course followed by four years in pharmacy school<sup>12</sup>. However, there are no PharmD programs.

Opportunities for graduates to work are similar to other countries where the vast majority of pharmacists work in the private sector, typically as community pharmacists, whereas institutional and pharmaceutical industry positions are very limited. While community pharmacies are readily accessible to the public, the poor image of pharmacists in this country prevents them from being fully utilized in health care facilities. Until very recently, graduates did not have to pass any qualification exam to get the practice license or to complete their registration within the Libyan Society of Pharmaceutical Sciences. However, this is no longer true as pharmacy leaders and stakeholders have already started to establish their new reforms agenda.

##### 3.1.2. Tunisia

With a population of about 10 million, Tunisia has 1 pharmacy school. The Faculty of pharmacy at Monastir launched a pharmacy diploma program in 1975. This particular university is a rare one in the Middle East, as its language of instruction is French [14]. The national diploma of Pharmacy requires three years of study; after a first cycle of study of two years with an award of the Diplôme d'Etudes Universitaires du Premier Cycle. Interestingly, the admission process is centrally controlled through the national university orientation system, which selects students based on an algorithm that computes student preference, scores, program of instruction at the secondary level, and the ministry-set quota for each field of study and institution [14]. Faculty of pharmacy at Monastir offers many other pharmacy related degree programs such as the National certificate in pharmacy, Certificate of specialist in Medical Biology, Masters of Biotechnology Applied to Infectious Diseases and Immunology, Masters of Drug Development, Doctor of Philosophy (PhD) in Pharmaceutical Science, and Bachelor of Science in Pharmaceutical Science [15]. Tunisia's health system is dominated essentially by public hospitals, whereas pharmacists practicing in the private sector are almost three times the number of those in the public [16] with 70% of pharmacists in Tunisia being women [17].

##### 3.1.3. Egypt

Egypt has a large population of 82 million and the number of the pharmacy schools is 24 (13 public and 11 private universities). Despite the fact that some programs have begun to offer diplomas in clinical sciences, with public schools focusing on increased clinical pharmacy training, the majority of schools offer baccalaureate degrees. Admission procedures are somewhat different between public and private schools. Studying pharmacy is amongst the most important choice for a majority of students in high schools, which results in a higher number of pharmacists even exceeding the need of the country [18]. Moreover, the majority of the Egyptian graduates are recruited to work in community pharmacies (65%), while 18% of the graduates prefer to work in hospitals and only about 12% usually work in industry or other health related sector [19].

##### 3.1.4. Saudi Arabia

Saudi Arabia, with a population of about 28 million, suffers from a shortage of qualified practitioners and academic personnel [20]. The first college of pharmacy was established in King Saud University, Riyadh, in 1959. Currently, there are nine active public and private pharmacy schools. The pharmacy education trend in the kingdom is somewhat different, as a majority of schools have upgraded their curriculums and the PharmD degree is now available. As a result, the majority of graduates in this country elect to practice in the hospital sector where services are well developed and clinical pharmacists are well remunerated [4]. However, community pharmacy practice is not highly developed, and such pharmacies are usually managed by expatriate pharmacists.

### 3.1.5. Jordan

Jordan has a population of about 6.2 million and there are 8 pharmacy schools across the country. The first two public faculties of pharmacy were established in 1980 in Amman and Irbid. The other 6 privately funded faculties of pharmacy are located within the Amman border and were established after the 1990's [20]. Two pharmacy schools in Jordan offer a PharmD degree, while the other 6 offer a baccalaureate degree only. Admission is based upon high school academic performances and no pre-pharmacy credit-hour requirements exist in Jordan [4]. The vast majority of pharmacists work in the private sector, typically as community pharmacists. However, institutional positions are also available, as well as opportunities with a thriving pharmaceutical industry. While pharmacy schools accept non-nationals, only Jordanians are eligible for licensure and practice within the country [4].

### 3.1.6. United Arab Emirates

United Arab Emirates (UAE) has a population of approximately 4 million, of which approximately 80% are expatriates. Pharmacy education has only begun about two decades ago; there are presently 7 private pharmacy schools. Although the numbers of pharmacists are increasing, there is yet a shortage [2]. Accordingly, more pharmacy programs were launched to meet the high demand of pharmacists. To date, all pharmacy schools offer baccalaureate degree programs. However, a higher diploma in pharmacy (D. Pharm) program was launched at Dubai Women's College in 1997 and the PharmD program is on offer exclusively to female UAE citizens, as a step towards encouraging UAE female citizens in the field of pharmacy [2]. Four to five years are needed to complete the allocated 150 to 222 credit hours for the Bachelor Pharmacy program. Furthermore, practical experience in hospital, community and pharmaceutical industry is mandatory in the country [4]. In addition pharmacists can only be licensed to practice after 2 years experience and passing the ministry of health licensing exam [21]. Pharmacists practice in retail, and hospital pharmacies drug information centers, pharmaceutical industry marketing, sales or research, academia (as instructors), wholesale companies, and nutrition outlets; with expatriate population dominating manpower [2].

### 3.1.7. Kenya

Kenya, with a population of about 40 million, has two universities offering pharmacy degree programs and 22 public and private colleges offering diploma in pharmacy programs [22]. University of Nairobi, being the main education hub, started its school of pharmacy in 1974. The school offers a 4-year Bachelors of Pharmacy degree, with 2-year Masters of pharmacy programs in Pharmaceutical Analysis and Clinical pharmacy. In addition to a 3-year PhD in pharmacy program, graduate and foreign-trained pharmacists are required to do a 1-year internship in pharmacy practice and pass the pharmacy board exams in order to get the license to practice. Pharmacy practice is based in retail, hospital, industrial settings, academics and research [22]. Encouragingly, clinical pharmacy services have recently been introduced in Moi University Hospital in Eldoret town, through shared training of University of Purdue pharmacy students of the United States with Kenyan pharmacy students from University of Nairobi to develop local services for urban needs [23].

### 3.1.8. South Africa

In South Africa, a nation populated with 49 million people, pharmacy education is provided in 8 pharmacy schools; all offering a four-year bachelor degree program. Masters in Clinical Pharmacy and other courses, in addition to a PhD in Pharmacy are also available in some schools. However, a Matriculation Exemption Certificate is a prerequisite for admission to the degree program [24]. This has to be followed by a 12-month pre-registration training period in a community pharmacy, hospital or industrial pharmacy; in a location approved by the Pharmacy Council of South Africa. However after getting registered, pharmacists have to do an additional year of pharmaceutical community service in a public setup before they can practice independently. The pharmacy practice is conducted in community, wholesale pharmacy, manufacturing pharmacy, consultant pharmacy and academic institutions [25].

### 3.1.9. Nigeria

Nigeria is the most populous country in Africa with approximately 140 million people and has 91 universities, however only 15 of them offer pharmacy programs. The Pharmacist council of Nigeria regulates the pharmaceutical education. All of the 15 universities offer a 5-year Bachelors degree in Pharmacy, while one also offers

a PharmD program. University of Nigeria is the largest pharmacy school in Nigeria and graduates an average of 180 pharmacists each year. There are no pre-registration requirements, only a minimum degree in Pharmacy, even foreign trained graduates need to attend an orientation program and be interviewed for registration [26]. Majority of pharmacists in Nigeria practice either in community and hospital settings. The introduction of clinical pharmacy practice in the 1980s led some hospital pharmacists to involve clinical activities like drug information service and unit dose dispensing. However, unlike many developed countries, the involvement of pharmacists in Nigeria in the application of the emerging roles has not progressed much [27].

**Table 1** shows summary of pharmacy education in some countries in Middle East and Africa.

### 3.2. Overview of the Future of Pharmacy Practice

Pharmacy practice has markedly changed in recent years. Previously, during the 1950's, pharmacist's responsibilities centered towards dispensing and compounding drugs, with hardly any communication with patients on their medication and the diseases they faced in their daily life [28].

Community pharmacies are ideally located within the community as the first entry port into the health care system. In addition, community pharmacists are also the most accessible healthcare provider to many chronically ill patients; they are up to five times more considerate about such cases than any other healthcare professional [29]. Community pharmacists are therefore in a unique position to improve the care for chronic diseased patients by collecting patient information, conducting medicine use reviews, counseling patients, collaborating and consulting with physicians regarding drug therapy, and monitoring treatment programs to achieve optimal health outcomes [30] [31]. Accordingly, many recent debates have been reflected on professional practice, questioning the need for professional services of pharmacists [32]. The primary objective of a community pharmacy is to improve the health and quality of life of the public at large. There is evidence that community pharmacy-based services have shown to contribute positively to patient care [33], and improved health outcomes in chronic disease management clinics [34] [35]. More recently, it has been suggested that the implementation of an intervention is associated with a 70% reduction in antibiotic over-prescribing for respiratory infections in hospitals in two Emirates of the UAE [36]. However, the future involvement of pharmacists in primary care will be shaped not only by consumer's views, but also by whether or not GP's consider pharmacists capable of pursuing such a role [37] [38]. While community pharmacists have been generally enthusiastic [39] and keen to take on the challenge [40], the reactions of GP's have been somewhat mixed, ranging from those who support very limited collaboration, to those who believe that community pharmacists should be able to undertake more rational prescribing [41] [42]. These contradictory attitudes amongst healthcare professionals may be confusing to the patient, and may consequently have a negative impact on patient outcomes. The extended services proposed for delivery by community pharmacists are unlikely to happen if GPs are unwilling to co-operate and delegate or share some of their traditional roles [43]. It may be argued that the extended role of pharmacists should be seen as an opportunity for physicians and patients alike to improve the primary health care system. Doctor's views on pharmacists' extended roles and perceptions vis-a-vis of pharmacists performing additional services should to be investigated [44]. Future pharmacists need to apply a more radical and patient-centered approach to managing

**Table 1.** Summary of pharmacy education.

Country	Population (in millions)	No. of pharmacy schools	No. of years for B. pharm degree	Pre-registration requirements (yes/no)
Libya	5.5	6	5	Yes
Tunisia	10	1	5	No
Egypt	82	24	5	Yes
Saudi Arabia	28	9	4-5	Yes
Jordan	6.2	8	5	Yes
UAE	4	7	4-5	Yes
Kenya	40	24	4	Yes
South Africa	49	8	4	Yes
Nigeria	140	15	5	No

medicine [45] [46]. In the UK, supplementary prescribing; which is defined as a voluntary partnership between an independent prescriber and supplementary prescriber, to implement an agreed patient-specific clinical management plan with the patient's agreement; will increase the choice of access to a wider range of services in primary care, helping people to get access to health care on their own terms [46]. Pharmacists should devote time to join training courses if they wish to become supplementary prescribers.

The Centre for Pharmacy Postgraduate Education (CPPE) in the UK has developed an educational program, based on a syllabus specified by the Royal Pharmaceutical Society and the National Prescribing Centre (NPC) that has developed supplementary prescribing competencies; in order to provide support for pharmacists preparing to take on the supplementary prescribing role [47]. Several UK Schools of Pharmacy have also been accredited to provide such training and assessment. Guidelines and centers that provide such support for supplementary prescribing do not yet exist neither in the Middle East or Sub-Saharan Africa.

### 3.3. Clinical Pharmacy Today

The discipline of clinical pharmacy practice has evolved over the past 30 years into a service known as pharmaceutical care and has started to become an essential component of the multidisciplinary team. In these settings, pharmacists practice therapeutic drug monitoring and nutrition support, participate in patient care rounds and have developed efficient and safe drug delivery systems with the evolution of critical care pharmacy satellites and other innovative programs [48]. It has been reported that approximately 5.3% to 11.4% of hospital admissions are related to the patient's drug therapy and associated with adverse drug reactions [49] [50]. Higher rates were found in elderly patients who are likely to be receiving multiple medications for long-term illnesses [50]. If such medication errors were corrected at the dispensing stage, it would have saved considerable primary care costs [51]. With the introduction of a computerized prescribing system in many developed countries, one can speculate that the figures now will be greater than ever due to the expected inadequate control of these new systems; repeated prescribing is potentially dangerous. It has been reported in one particular study [52] that repeats accounted for 75% of all items and 81% of prescribing costs; 48.4% of patients obtained their continuous supply of medicine by a repeated prescription [53]. Any improvements in controlling repeats will necessitate changes in procedures and training; with more resources and imaginative use of nurses and involvement of a clinical pharmacist at prescribing and dispensing stages [49]. Some pharmacists expressed their dissatisfaction regarding the misuse and underestimation of their professional skills. It's not surprising that many found dispensing medications and running what sometimes seem like gift shops, to be mind-numbing. However another obstacle to their professional success is patient's care rounds, because of the lack of clinical orientation, which all pharmacists realize. The pharmacist must work co-operatively with the physician with a major portion of the pharmacist's time being devoted to clinical activities. Moreover, pharmacists need to realize that review of basic drug information is also essential to contribute positively to the healthcare team. Difficulties arising in applying these principles can be overcome by changing traditional attitudes, philosophies and responsibilities of each component of drug utilization axis which include physician, pharmacist, nurse and patient. Practicing in the patient's care environment does call for new skills from the pharmacist's perhaps; these skills are the newest addition to the clinical pharmacy practice. This calls upon pharmacists to have: 1) a far better medical terminology so that, they can understand physicians and communicate with them; 2) training on the aspect of initiating and administering intravenous preparations; 3) a refreshing course having the criteria for vein selection, venous puncture, venous cannulation, indications for intravenous therapy, complications, trouble shooting; and practical experience in administering intravenous therapy; 4) continuing pharmaceutical with clinical orientation education activities; and 5) foundation of complete description of the new services that pharmacists pledge to provide both in primary and secondary care sectors. Although it is not the usual standard practice to have pharmacists administering intravenous medications, there is no legal statute to prevent this expanded role for pharmacist [54]. It is noteworthy that the selection of appropriate pharmacy personnel to provide these clinical services is also important and should have certain qualities as: a) adequate knowledge of clinical database, b) self confidence and initiative, c) conscientiousness, and d) desire for professional growth.

### 3.4. The Clinical Role of Hospital Pharmacists

A basic objective of clinical pharmacy services is to provide the right drug to the right patient at the right time. Inappropriate medication can have serious consequences, leading to increased morbidity, hospital admission

and/or prolonged hospitalization, even death and affects the health budget. The results of a single study [55] have showed that a total of 2103 clinically important medication errors were detected by pharmacists over one-year period in a teaching hospital. In that particular study, medication errors related to incorrect dose was estimated by 58%; failure to modify therapy in accordance with hepatic or renal function, by 14%; failure to account for patients history of hypersensitivity by 12%; use of wrong drug name or dosage form by 11%; and incorrect calculation by 11%.

To meet the objectives of clinical pharmacy mandates the overall management of medicines by pharmacists in the ward or at any part of the hospital dealing with drugs through advice on safe handling and formulary management. In one particular study the workers have revealed the importance of the introduction of clinical pharmacy services within the operating theatre, of an 850 bed-hospital, to control proper handling and distribution, patient safety, and to promote the cost effective use of drugs [56]. Pharmacists need to contribute to the care of the individual patient through the provision of drug information and assisting in problem solving. In the hospital setting, the clinical role of pharmacist is expanded, because of the opportunity to interact with the prescriber, promote the rational prescribing and use of drugs. A proactive approach to providing information to physicians and nursing staff can improve the standing of pharmacy. By questioning the patient about his medications history and looking in his medical record the pharmacist can influence the selection of drugs and dosage regimens; monitor both his compliance and therapeutic response; and recognize and report adverse drug reactions (ADR). Most importantly through such therapeutic drug monitoring, the clinical pharmacist can determine optimum dose regimens for drugs with a fairly narrow therapeutic range such as theophylline, phenytoin and digoxin. Generally speaking, clinical pharmacists are responsible for all aspects of drug therapy; they should be able to verify therapeutic doses of a specific drug and correlate with hematological laboratory values. They also, should be able to provide correct and quick information as needed and when needed for the healthcare professionals on proper selection of medications; side effects; drug-drug, drug-food interactions, and drug-laboratory test interference for most of drugs used in a particular unit or department. Moreover, provide a safe and efficient drug distribution system for all patients treated, and also by supplying nurses with accurately prepared unit-dose drugs for patients.

### 3.5. Pharmaceutical Care in Community Practice

In 2006 the United Kingdom Clinical Pharmacy Association changed its mission statement and proposed new a statement; “To promote expert practice in medicines management for the benefit of patients and the public by establishing standards, developing the workforce and advancing innovation in all health care settings”. Such proposed changes were aimed to reflect the use by Government and other bodies of the term “medicines management” rather than “pharmaceutical care” [57]. A UK model of pharmacy-based pharmaceutical care defines three roles for the pharmacist namely: supplying medication, advising on the use of medication, monitoring the patient and the drug therapy outcomes, suggesting that pharmacist should accept more responsibility for drug use control [29]. The National Health Service (Pharmacy in the Future) Plan for the year 2000 clearly emphasized on the need of community pharmacists to be more involved in promoting good health, offering counseling and supporting patients with chronic disease [58] and the new contractual framework for community pharmacy [59] [60] will enable pharmacists to develop this role even further. In the year 2000, the American College of Clinical Pharmacy issued a white paper, “A vision of pharmacy’s future role, responsibilities, and manpower needs in the USA” with an aim to reinforce the pharmacist’s patient-centred role [61]. However, one should not ignore the efforts made by other organizations such as the American Pharmacists Association and the American Society of Health-System Pharmacists to support the expanded role of pharmacists and to increase recognition of the profession.

Although pharmaceutical care as a concept is sweeping over the pharmaceutical world, implementation in daily community pharmacy practice ex: in almost all European countries has been hampered due to inadequate training, the business orientation of pharmacists, isolation of pharmacists, physical layout of pharmacies, patient expectations, the attitude and opinion of other health professionals, lack of enthusiasm and lack of contact with patients, time and money [8]. It has been demonstrated that pharmacy practice continues to be the structure and process for medication dispensing, rather than the positive outcomes of pharmaceutical care [30] [62]. This may be changing, in recent years, due to increased emphasis on clinical training in under and postgraduate courses.

There are a number of differences noted between pharmaceutical care and dispensing pharmacy [63]. **Table 2** summarises the differences between dispensing and providing pharmaceutical care.

**Table 2.** Differences between dispensing and providing pharmaceutical care.

Dispensing pharmacy	Pharmaceutical care
Product business.	Service (people) business.
Objective is to bring product to the customer.	Objective is to bring the pharmacist to the patient.
Decisions focus on the business.	Decisions focus on the patient.
Inventory generates revenue.	Patient care generates revenue.
Available service supports the product.	Available product supports the service.
Success measured as number of prescriptions.	Success is measured as patient outcomes
Spaces are organized to display and sell products.	Spaces are organized to meet patient's need.
Records are kept primarily to meet legal requirement concerning the drug product.	Documentation supports patient care.
Schedule for repeat prescription determined by customer supply of drug product.	Schedule for follow-up determined by risk and benefit of drug therapies and needs of the patient.
Business is passively sought through the generation of prescriptions.	Business is actively sought through the recruitment of patients.

### 3.6. The Clinical Role of the Community Pharmacist

The clinical role of the pharmacist may be applied today in both community and hospital pharmacy arenas. A community pharmacist seeks to collect and integrate information about the patient's drug history; prepares a patient medication record kept in the pharmacy; clarifies the patient's understanding of the intended dosage regimen and the method of administration and advises the patient of drug-related precautions, monitors and evaluates therapeutic response. A community pharmacist should be fully aware of the patient's past and current drug history, he or she can therefore provide essential advice to the prescriber. In addition, community pharmacists can compile and maintain information on all medicines, particularly new ones, and use it in promoting the rational use of drugs by providing advice and explanations to physicians and to members of the public. In order to contribute to health gains in defined patient populations within limited resources, particular forms of pharmaceutical care must be targeted to particular patient groups. Pharmacists should use public health information, from the health needs assessments of patient populations to help set local goals for pharmaceutical care [11]. Equally, pharmacists have the opportunity to generate information about medication usage valuable in the public health domains and policies.

## 4. Discussion

One of the most dramatic changes affecting the education and future of pharmacy practice worldwide, as we move into the next decade is the concept of clinical pharmacy. Many developed nations already have regulations, policies, support centers, electronic patient databases in both community and hospital pharmacies in place needed to facilitate the launch and implementation of clinical pharmacy practice. On the other hand, it was realized in this review that pharmacy practice and progress in many of the Arab and African countries is a mirror image of the status of the country itself. Any advancement in pharmacy education and practice get dragged behind probably; because of strained resources e.g.: in Nigeria there are only 15 pharmacy schools amidst a 140 million settlement. However, although the overall level of community services provided is low, over the past two decades gradual progress has been observed. Despite the adversity that faces academics and practitioners alike, there is a strong and uniform desire to advance the science and practice of pharmacy. For this reason, we are optimistic that the future of pharmacy education and practice will be as positive as it is elsewhere in the world, but we should start to think about a new vision for the future of pharmacy practice from now that is more relevant and appropriate to the level of pharmacy progress in developing countries in order to speed up the climb towards practicing clinical pharmacy professionally. Now it is time that health officials and stakeholders encourage need based education and provision of clinical services in community and hospital pharmacies. To explain that; in countries with a high number of morbidity and mortality of diabetics, community pharmacists should be trained and utilized to monitor glucose levels and patient drug compliance. Furthermore, pharmacists too have a moral responsibility to maintain a high level of knowledge and professional competence through a

process of life-long learning. This can be achieved through providing continuing education programmes. In addition, pharmacists have a vital role in scrutinizing prescriptions to check that the drug prescribed and its dose match the patient requirements in terms of indication, age, underlying disease and correct medication. Colleges of pharmacy should continue to aim helping their students to refine their skills in order to create new and effective working relationships with other disciplines. Through a program of conferences, workshops practice interest groups and publications; colleges of pharmacy and pharmacy profession leaders should provide facilities for practice pharmacists to develop, share and exchange ideas, research findings and practical experiences. The pharmaceutical association in any given country should intend to contribute to pharmaceutical care by encouraging the development and evaluation of new services to patients. Furthermore, the association should offer a supportive network to help pharmacists to engage with the demand for better health care and to meet their public health needs.

## 5. Conclusion

Colleges of pharmacy need to revise and update their curricula to accommodate the progressively increasing development in the pharmaceutical education and the evolving new roles of practicing pharmacists in their community.

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