



## Review

# Pharmacy education in Saudi Arabia: Achievements and challenges during the last two decades with a focus on Taif University as a case study



Ahmed Ibrahim Fathelrahman<sup>a</sup>, Majed Alrobaian<sup>b</sup>, Waleed Mohammad Altowayan<sup>c</sup>, Ibrahim Maghrabi<sup>a</sup>, Yousif A. Asiri<sup>a,\*</sup>

<sup>a</sup> Department of Clinical Pharmacy, College of Pharmacy, Taif University, P.O. Box 11099, Taif 21944, Saudi Arabia

<sup>b</sup> Department of Pharmaceutics, College of Pharmacy, Taif University, P.O. Box 11099, Taif 21944, Saudi Arabia

<sup>c</sup> Department of Pharmacy Practice, College of Pharmacy, Qassim University, Qassim, Saudi Arabia

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## ABSTRACT

Basic expectation from graduates of any pharmacy program is to be able to provide pharmaceutical care at both patients and community levels, be able to solve problems arising during practice, be able to improve quality and outcomes of the services provided continuously and be able to respond effectively to patients and community changing needs. Pharmacy education in Saudi Arabia established in 1959 by founding the first college in Riyadh (King Saud University) followed by establishing two pharmacy colleges in Jeddah (King Abdulaziz University, 2001) and Abha (King Khalid University, 2001), then a college in Al Ahsa (King Faisal University, 2002), followed by four colleges three-years later in each of Buraydah (Qassim University, 2005), Madinah (Taibah University, 2005), Taif (Taif University, 2005) and Makkah (Umm Al-Qura University, 2005). Up to date the number of pharmacy colleges offering basic degrees in pharmacy are 21 governmental and eight privates. This review describes pharmacy education in Saudi Arabia, the historical perspective, current situation, and the important features. The report focuses on the changes during the last two decades covering three main aspects (1) Clinical education and training, (2) Research output, and (3) Quality and accreditation.

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\* Corresponding author.

E-mail addresses: [aihassan@tu.edu.sa](mailto:aihassan@tu.edu.sa) (A.I. Fathelrahman), [majed.alrobaian@tu.edu.sa](mailto:majed.alrobaian@tu.edu.sa) (M. Alrobaian), [w.altowayan@qu.edu.sa](mailto:w.altowayan@qu.edu.sa) (W.M. Altowayan), [i.maghrabi@tu.edu.sa](mailto:i.maghrabi@tu.edu.sa) (I. Maghrabi), [yasiri@tu.edu.sa](mailto:yasiri@tu.edu.sa) (Y.A. Asiri).

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## 1. Introduction

The goal of pharmacy education is to prepare future pharmacists with knowledge, skills and competencies required for excellent practice. Basic expectation from graduates of any pharmacy program is to be able to provide pharmaceutical care at both patients and community levels, be able to solve problems arising during practice, be able to improve quality and outcomes of the services provided continuously and be able to respond effectively to patients and community changing needs. This cannot be achieved without having graduates prepared with up-to-date knowledge, basic research-related skills, attitudes that are supportive of positive changes, being continuous self-learners, effectively engage in and easily adapt to any surrounding work environment and being able to work individually and within a team. Pharmacy education should be seen and evaluated in the above context and the success of such education is based on achieving previous goals and outcomes. Pharmacy education in Saudi Arabia articulates on the same framework trying to utilize latest and most advanced teaching and learning techniques. The journey of pharmacy education in Saudi Arabia reflects more than six decades of progress, ambition, passion, and achievements.

This review describes pharmacy education in Saudi Arabia: the historical perspective, current situation and important features, and the drivers for improvements, with special focus on the changes during the last two decades.

## 2. Historical perspective

Since the establishment of the first pharmacy college in Riyadh (King Saud University) in 1959 and for forty years, pharmacy education in Saudi Arabia progressed gradually and slowly (Alhamoudi and Alnattah, 2018). A dramatic transformation had occurred by the beginning of the twenty first century started with establishing two pharmacy colleges in Jeddah (King Abdulaziz University, 2001) and Abha (King Khalid University, 2001) which were shortly followed by a college in Al Ahsa (King Faisal University, 2002). Three years later, another four colleges successfully joined the journey in pharmacy education in each of Buraydah (Qassim University, 2005), Madinah (Taibah University, 2005), Taif (Taif University, 2005) and Makkah (Umm Al-Qura University, 2005).

## 3. Status of pharmacy education in Saudi Arabia

Up to date, the number of pharmacy colleges offering basic degrees in pharmacy are 21 governmental and eight privates. In this report, the description of pharmacy education in Saudi Arabia will be handled by covering three main features: (1) Clinical education and training, (2) Research output, and (3) Quality and accreditation.

### (1) Clinical education and training

The Saudi Society of Clinical Pharmacy (SSCP) was established in 2018 (Badreldin et al, 2020). However, clinical pharmacy practice and education have been well-known and established in Saudi Arabia twenty years earlier and an advanced clinical pharmacy training (i.e., residency programs) was introduced officially into

pharmacy education by the beginning of the twenty first century. SSCP defines clinical pharmacy as “the pharmacy profession’s division in which the licensed pharmacist obtains the required post-graduate training or education or to optimize patient outcomes via providing cost-effective, evidence based comprehensive medication management, promoting disease prevention, and assuring continuity of care at the individual and population levels” (Korayem et al., 2021). The definition represents the core competencies that clinical pharmacists are expected to show while practicing in Saudi Arabia: optimizing patient therapy and outcomes, assessing medications cost-effectiveness, medication management, evidence-based practice, and health promotion and continuity of care.

According to Alhamoudi and Alnattah (2018), more than twenty governmental pharmacy colleges and at least two private colleges in Saudi Arabia offer basic pharmacy degrees entitled as PharmD. According to Badreldin et al (2020), there are 30 public and private pharmacy schools in Saudi Arabia, 11 in the central region, 7 in the western region, and 4 in each of the northern, southern, and eastern regions. Of those, twenty-four schools/ colleges offer a PharmD degree. This is considered a clinically oriented style of education which represented a dominant global interest that qualify pharmacists to work primarily in hospital settings to provide clinical pharmaceutical care, although, such care can be provided to the patients through other settings of practice such as community pharmacies, primary care centers and as domiciliary services. In addition, there are postgraduate programs offering master’s degrees in clinical pharmacy in each of King Saud University and Qassim University.

In 2001, the Saudi Commission for Health Specialties (SCFHS) established the first national clinical pharmacy residency program (Zaitoun, 2018). In addition, three training centers offering ASHP (i.e., American Society of Health-System Pharmacists) - accredited PGY1 programs have been established besides three ASHP- accredited PGY2 programs in cardiology, oncology and solid organ transplantation coordinated by King Faisal Specialist Hospital and Research Center in Riyadh (Zaitoun, 2018). According to Badreldin et al (2020), up to date, there are twenty-one pharmacy residency programs offering clinical pharmacy training at post-graduate level located at each of central region (10 programs), western region (6 programs), eastern region (2 programs), southern region (2 programs) and northern region (one program).

### (2) Research output

Research is a core component of any pharmacy academic program together with teaching and serving the community. To achieve excellence in this regard, pharmacy programs should focus on two aspects one is to prepare graduates with solid research experiences that enables them to be involved furtherly during practice in practice-based research and be able to pursue additional graduate studies. The second aspect is to produce good research output record and contribute via research activities to the advancement of medical and pharmaceutical care, pharmaceutical industry, and public health in general both locally and at global levels.

It is important to highlight here that the present section is not intended to describe pharmacy practice research in Saudi Arabia but concerned primarily with pharmacy education-related

research, although some overlap exists between the two types of research. According to Sweileh et al (2018), Saudi Arabia ranked number ten worldwide among top 10 productive countries in pharmacy education-related research during 2000–2016 following the US, UK, India, Australia, Canada, Malaysia, Japan, Spain, and China. This is a promising statistic deserves a careful strategic planning and hard work to ensure remaining at the top and score better progress. However, evidence indicated presence of some shortages in the preparedness and research-related activities in some areas of practice and some geographical regions at the level of practicing pharmacists and pharmacy students. In this regard, Al-Arifi (2019) surveyed pharmacy students at King Saud University to determine their attitudes towards scientific research and/or academic careers in Saudi Arabia. Respondents showed positive attitudes towards research activities and strong desire to be involved more in research publications. Alqadi and AbuAlhommos (2020) assessed the intentions and barriers to carrying out medical research among clinical pharmacy students in the Eastern region of Saudi Arabia (King Faisal University and Imam Abdulrahman bin Faisal University). The authors concluded that the intention among participants to carry out medical research was poor. Only slightly more than one third of participants reported having previous research experience and almost the same proportion reported being involved in research at time of survey. According to the study participants, this was due to presence of barriers including lack of funding, lack of support from their colleges and coordination difficulties within research groups. Sultana and colleagues (2016) studied the attitudes, barriers, and facilitators to practice-based research among hospital pharmacists from King Abdulaziz Medical Cities in Central, Eastern and Western region hospitals of Saudi Arabia. Pharmacists who had reported having a prior research experience represented fifty-nine percent. Authors in conclusion highlighted the need to provide additional support to enable Saudi pharmacists in conducting practice-based research. In the same context Alomi et al., 2020 reported an inadequate knowledge about biostatistical analysis and software applications used in data collection and analysis among the pharmacists in Saudi Arabia and recommended implementing strategies to improve the level of pharmacists' knowledge via comprehensive education and training of biostatistics used in pharmacy research.

(3) Quality and accreditation

Quality concerns provided a driving fuel that pushed pharmacy colleges in Saudi Arabia to seek academic accreditation nationally and internationally. Up to date, nine programs are accredited nationally by the Saudi Education and Training Evaluation Commission (ETEC) formerly NCAAA and six programs are certified by

the US Accreditation Council for Pharmacy Education (ACPE). Table 1 presents detailed information about pharmacy programs accredited by the NCAAA whereas Table 2 shows pharmacy programs certified by the ACPE. Among NCAAA accredited programs, three programs received conditional status whereas all other six programs got full accreditation status the latest was the Doctor pharmacist program of college of pharmacy, Taif University dated May 2021 and valid till 2028 (i.e., seven years period). All accredited programs were government (public) -based except two programs were private under Ibn Sina national college for Medical Studies and Riyadh Elm University. Both programs received NCAAA accreditation earlier before all public colleges (2016 and 2017, respectively). All programs certified by the US Accreditation Council for Pharmacy Education (ACPE) were public except the Pharmacy Program/ PharmD of Batterjee Medical College was private.

4. Drivers for improvements and changes

The introduction of a couple of new concepts and the occurrence of local environmental changes worked as drivers for improvements and changes in pharmacy education in Saudi Arabia. These include: (1) The interest in establishing national Saudi educational standards, (2) The growing global interest in E-learning, (3) The growing concerns about industry in Saudi Arabia (Saudi Arabia Vision 2030), and (4) The Saudi Commission for Health Specialties requirements (residency programs, SPLE exam).

- (1) The interest in establishing national Saudi educational standards

The presence of national educational standards is helpful for the advancement of pharmacy education. It is good to have a minimum acceptable level of comparability in the features of the provided education and quality of the outcomes among programs offered in the country. This enables the provision of standardized pharmaceutical care through all the country (i.e., equity), the provision of best care (i.e., quality) and the rational use of resources through collaboration and sharing (i.e., economy). Stakeholders responsible for establishing this include (1) the pharmacy colleges, (2) the Education and Training Evaluation Commission (ETEC) formerly NCAAA, and (3) the Saudi Commission for Health Specialties (SCFHS). The NCAAA which identifies the educational quality standards, evaluates, and accredits pharmacy programs in Saudi Arabia, has established a Saudi national qualification framework that determines the graduate's attributes and the required learning out-

**Table 1**  
Pharmacy programs accredited by Education and Training Evaluation Commission (ETEC) formerly NCAAA as of 28 July 2021.

No.	University	Program	Organization Type	Degree	Accreditation type	Date of accreditation
1	Ibn Sina national college for Medical Studies	Pharm.D. Clinical Pharmacy	Private	Bachelor	Full	May 2016 - April 2023
2	Riyadh Elm University	Pharmaceutical Sciences	Private	Bachelor	Full	May 2017 - May 2021
3	Qassim University	Doctor pharmacist	Public	Bachelor	Full	May 2018 - April 2025
4	King Saud ibn Abdul-Aziz University for Health Sciences	Doctor pharmacist	Public	Bachelor	Full	September 2019 - August 2026
5	King Saud University	Doctor of Pharmacy	Public	Bachelor	Conditional	January 2020 - December 2023
6	King Faisal University	Doctor pharmacist	Public	Bachelor	Full	May 2020 - April 2027
7	Princess Nourah bint Abdulrahman University	Doctor of Pharmacy	Public	Bachelor	Conditional	March 2021 -February 2025
8	Imam Abdurrahman Bin Faisal University	Doctor pharmacist	Public	Bachelor	Conditional	May 2021 - April 2025
9	Taif University	Doctor pharmacist	Public	Bachelor	Full	May 2021 - April 2028

Source: Education and Training Evaluation Commission (ETEC) formerly National Center for Academic Accreditation and Assessment (NCAAA): Accredited programs. <https://etec.gov.sa/en/productsandservices/NCAAA/academic/Pages/ProgramsDirectory.aspx#?> (accessed 28/7/2021).

**Table 2**  
Pharmacy programs certified by ACPE as of 28 July 2021.

No.	University	College/ Program	Organization Type	Degree	Accreditation type	Year of issue
1	King Saud University	College of Pharmacy/Bachelor	Public	Bachelor	Certification	2012–2013
2	King Saud University	College of Pharmacy/PharmD	Public	Bachelor	Certification	2012–2013
3	King Faisal University	College of Clinical Pharmacy/PharmD	Public	Bachelor	Certification	2013–2014
4	Qassim University	College of Pharmacy/PharmD	Public	Bachelor	Certification	2016–2017
5	Batterjee Medical College	Pharmacy Program/PharmD	Private	Bachelor	Certification	2019–2020
6	Prince Sattam bin Abdulaziz University	College of Pharmacy/ Bachelor of Pharmaceutical Sciences	Public	Bachelor	Certification	2019–2020

Accreditation Council for Pharmacy Education (ACPE): Programs with certification status by country. <https://www.acpe-accredit.org/international-programs-by-country/> (accessed 28/7/2021).

comes. SCFHS safeguards the professional practice of health care providers including pharmacists.

Aljadhey et al (2017) conducted a qualitative study that explored the future of pharmacy education in Saudi Arabia and discussed the challenges and opportunities to improve experiential training. Among the major themes covered were program educational outcomes, adoption of an integrated curriculum and the use of advanced teaching methodologies. The study findings represent a unified vision of pharmacy educators on the future of pharmacy education in Saudi Arabia.

## (2) The growing global interest in E-learning

In the recent years, there was a growing interest in the e-learning worldwide in various educational fields. This would help increase the accessibility to education by the learners and save resources. This interest witnessed a dramatic increase upon the COVID-19 pandemic outbreak where lockdown and social distancing required limiting closed personal interactions. The COVID-19 experience has proved that the infra-structures for e-learning in Saudi Arabia are well established and that the available resources are suitable to make e-learning capable of standing alone as a mode of teaching and learning ahead from traditional model. However, in the field of pharmacy, there is a need to consider a mixed hybrid mode of learning that combines traditional face-to-face and e-learning approaches.

Almetwazi et al (2020) reported the experience of college of pharmacy at King Saud university (KSU) with COVID-19 outbreak and discussed the transitions occurred as a result regarding classroom teaching, laboratory teaching, experiential training, assessment, and extracurricular activity and student support. Under lesson learned, the authors concluded that “University closure and sudden turn to virtual teaching worldwide have highlighted many conceptual, educational, and technical gaps. Each university within an educational system reacted within its constraints. Pharmacy colleges in Saudi universities were no exception. Being part of KSU, our college was supported with multiple enablers that facilitated such a quick transition in educational style. KSU has invested generously in the electronic Learning Management System. For instance, whether used by an instructor or not, all registered students were automatically synchronized in Blackboard and their records were accessible to the instructor. Moreover, KSU has subscribed to many software and platforms that provided alternative or complementary virtual classes and meeting options such as MS Teams and Zoom”. Almaghaslah and Alsayari (2020) assessed satisfaction of the academic staff in the college of pharmacy King Khalid University Abha, Saudi Arabia with suspending face-to-face teaching and turning to web-based education. More than half the surveyed staff agreed or strongly agreed that the sudden shift to online education was done smoothly, more than half agreed or strongly agreed that virtual lectures were more flexible than face-to-face lectures, and a majority agreed or strongly agreed that the technology used for online education was reliable.

Alqurshi (2020) investigated the impact of COVID-19 lockdown on pharmaceutical education in Saudi Arabia. The study which surveyed 700 pharmacy students from 19 colleges and 74 faculty members from 10 colleges was designed to explore stakeholders' satisfaction in three areas of emergency distance teaching/learning: The use of virtual classrooms, completion of course learning outcomes (CLOs) and assessment via alternative methods during the COVID-19 lockdown period. While it was challenging for most academic staff (>60%) to deliver multifaceted scientific concepts over virtual classrooms, >35% of students and 60% of staff raised concerns on the absence of student–student and student–teacher interactions. Emergency remote teaching has forced staff to use substitute assessment techniques, which the majority (70%) believe had a positive effect on students' overall skills. Approximately half of students (45%) were worried about the lack of guidance accompanied by unfamiliar assessments techniques.

## (3) The growing concerns about industry in Saudi Arabia (Saudi Arabia Vision 2030)

According to the Organization of Islamic Cooperation Statistical Economic and Social Research and Training Centre for Islamic Countries (SESERIC) (2011), Saudi Arabia has the largest number of local pharmaceutical manufacturing factories among the GCC countries totaling 27 with an investment of US\$ 619 million.

Vision 2030 of Kingdom of Saudi Arabia includes eleven programs four of them namely (a) The Privatization Program, (b) The National Industrial Development and Logistics Program, (c) the Human Capability Development Program, and (d) The Health Sector Transformation Program when read all together direct the pharmaceutical sector towards more investment in pharmaceutical industry and direct pharmacy education towards more involvement in teaching and training of pharmacy students in industrial pharmacy. The Privatization Program launched in 2018 aims to enhance the role of the private sector in providing services and making government assets available (Vision 2030 Kingdom of Saudi Arabia, 2021a). The National Industrial Development and Logistics Program launched at the beginning of 2019 aims to transform the Kingdom into a leading industrial powerhouse and a global logistics hub (Vision 2030 Kingdom of Saudi Arabia, 2021b). The Human Capability Development Program: one of the newly refreshed Vision 2030 programs created to develop citizens' capabilities, prepare them for the future, and support them to seize opportunities. The program focuses on instilling values, developing basic and future skills, and the enhancing knowledge in a variety of fields. This ensures citizens participate effectively in the ongoing local economic, social, and cultural developments while also competing in the global labor market (Vision 2030 Kingdom of Saudi Arabia, 2021c). The Health Sector Transformation Program; one of the newly established Vision 2030 programs; aims to ensure continued development of healthcare services in the Kingdom and focus efforts in this vital sector (Vision 2030 Kingdom of Saudi Arabia, 2021d).



An earlier study conducted by Bin Saleh et al (2015) assessed whether Saudi pharmacy students are willing to contribute to local pharmaco-industrial fields. Most students (83%) showed that they had not received practical training in the pharmaceutical companies, whereas lower proportion of them (17.2%) felt that they had the competencies required to work in the pharmaceutical industry upon graduation. Most students (66.7%) picked clinical pharmacy as their future career field while only 10.9% indicated interest to work in a pharmaceutical industry career. Later, Alhomoud et al (2019) explored career choices and preferences of Saudi pharmacy undergraduates from all education levels at different colleges of pharmacy across Saudi Arabia from October 2017 to March 2018. Among findings was hospital pharmacies were the preferred area of practice selected by 51.6% of the respondents. This was followed by academia and research centres selected by 24.8%, whereas the pharmaceutical industry and community pharmacies were the least preferred selected by 7% and 2%, respectively. Nevertheless, a similar study conducted by Bannan et al. (2021), surveyed PharmD students in their last year (i.e., interns) in the academic year 2018–2019, found that the top ranked career goals of the interns were industry and drug company followed by clinical pharmacy. This finding reflects a change in the orientation among pharmacy students who are about to be graduated who would be reading the current situation and the future opportunities more carefully than the students from lower levels. Alsaddique (2017) wrote about the future of pharmaceutical industry in the GCC countries. He concluded “another factor which will assure the success of the industry is the training of the nationals to understand and practice the industry. Pharmacy schools should cater their curriculum to provide the necessary education and training to build the new workforce for this industry. This industry doesn’t need a lot of pharmacists but a lot of technical personnel”.

(4) Saudi Commission for Health Specialties (SCFHS) requirements (residency programs, SPLE exam)

The SCFHS which was established in 1983 is responsible for the supervision and assessment of medical training programs in Saudi Arabia including those which are pharmacy-related (Saudi Commission for Health Specialties website, 2021). In addition, SCFHS controls health professions’ practice and develops the standards for such practice. The SCFHS categorize practicing pharmacists into three categories pharmacists, senior pharmacists, and consultant pharmacists (Saudi Commission on Health Specialties, 2014). In the year 2001, SCFHS established the first national residency program to prepare Saudi pharmacists with necessary clinical and pharmaceutical competencies required for practicing effectively as pharmaceutical care service providers (Alrasheedy and Hassali, 2018; Badreldin et al, 2020). In 2013, SCFHS announced the establishment of two specialty residency programs which are a two-years clinical pharmacy diploma equivalent to a professional master and a three-years Saudi certificate in clinical pharmacy equivalent to a professional doctorate (Saudi Commission for Health Specialties (SCFHS) Scientific Council of Pharmacy, 2017; Alrasheedy and Hassali, 2018). As mentioned earlier, up to date, twenty-one pharmacy residency programs governed by SCFHS offer clinical pharmacy training at post-graduate level distributed across Saudi Arabia (Badreldin et al, 2020).

Before being considered eligible for practice, fresh graduated pharmacists are required to pass the Saudi Pharmacist Licensure Examination (SPLE) which is set by SCFHS. The SPLE assesses four competency areas: basic biomedical sciences (10%), pharmaceutical sciences (35%), social and administrative sciences (20%), and clinical sciences (35%) (Saudi Commission on Health Specialties, 2017). Beginning from 2020, SCFHS started releasing the passing rates of graduates from each pharmacy school which offers a great

opportunity for assessing and comparing achievements of all pharmacy programs. This is a sort of an outcome indicator that can be used for benchmarking between programs for quality purposes.

## 5. The experience of Taif University

The College of Pharmacy, Taif University was established in the year 2005. It included five academic departments namely the pharmacognosy, pharmacology, pharmaceuticals and industrial pharmacy, clinical pharmacy, and pharmaceutical chemistry. A six-year clinically oriented Pharm.D. program is the sole program offered by the college at present time. The curriculum is composed of 86 courses provided over twelve semesters of study as 218 credit hours distributed between different educational disciplines including institution requirements (11 courses given in 22 h), program requirements (60 courses given in 163 h), graduation project courses (4 courses given in 6 h), and field experience (11 courses given in 27 h including introductory pharmacy practice experiences 1 & 2 and 9 advanced pharmacy practice experience courses).

The college of pharmacy went through two programmatic transformations during the years 2016–2017 and 2018–2019 under a project sponsored by the Taif University. Recently, the college of pharmacy at Taif University started an enthusiastic plan for establishing postgraduate programs in the areas of clinical pharmacy, pharmaceutical industry, and pharmaceutical chemistry. This would increase its impact on the Saudi community in general and on the community of the western region specifically.

In the year 2020, Taif University received the national institutional accreditation from the NCAAA. The university entered for the first time the Academic Ranking of World Universities (ARWU), also known as the Shanghai Ranking, becoming Saudi Arabia’s fourth best university and the 872 globally in 2021 classification. At Taif University level during 2021, the college of pharmacy got the first place among Taif University medical colleges in terms of research outputs. This indicates that the college is taking the right steps to be on the right position as a leader in pharmacy-related research in conjunction with KSA national vision and interest. In addition, the college received full programmatic accreditation from NCAAA for its PharmD program. This was a distinguished achievement given that it is the first program receiving the national accreditation after the updates of accreditation criteria. This result was an outcome of more than five years of hard and continuous teamwork that involved all college including leadership, academic staff, administrative staff, students, and other stakeholders (i.e., employers and alumni) with a strong support from the university higher authority. The passion for continuing quality journey internationally has led the college of pharmacy to apply for the US Accreditation Council for Pharmacy Education (ACPE) accreditation starting from this year 2022.

The college relied on building partnerships with national and/or international regulatory, industrial, academic and research institutions to strengthen and extend its capacity for training and research. This included partnerships with governmental departments such as Forensic Medicine and Criminal Investigation Authority in Makkah, and Saudi Food and Drug Authority (SFDA). Besides Ministry of Health and Military hospitals which represented basic sites for students training inside and outside Taif, partnerships included pharmaceutical industry and pharmaceutical services providers like Pfizer Pharmaceutical Company, Batterjee Pharmaceuticals Factory, Nahdi Medical Company, and sterile solutions factory in Jeddah. Internationally, the college of pharmacy collaborates with Strathclyde Institute of Pharmacy & Biomedical Sciences (SIPBS) - UK to advance education and training in industrial pharmacy. One of the important future outcomes will be a master program.

The above context provided a driving fuel for the college and its students to score better achievements on a national and international level among pharmacy colleges in Saudi Arabia and the Gulf region. According to a local report compiled from SCFHS data, there are promising statistics on Taif University graduates' performance in SPLE (the Development and Accreditation Committee, 2021). One of these is that the average passing score of the graduates increased from 568 in 2019, to 581 in 2020, to 597 in 2021. The maximum score gained by a graduate also increased from 686 in 2019, to 692 in 2020, to 734 in 2021 knowing that the later score was the highest score gained among all Saudi graduates in 2021. A research team from the college won the second-place award in a research poster competition at the Saudi International Pharmaceutical Conference & Workshop (SIPHA) 2022. Internationally, the college students won three prizes for best display and best organized pharmacy posters at Dubai International Pharmaceutical & Technologies Conference & Exhibition (DUPHAT) 2022 held in the Emirate of Dubai, the United Arab Emirates. The names of ten scientists from the College of Pharmacy, Taif University were included in the list of top 3000 most cited scholars in Saudi Arabia based on World Scientists and University Rankings from AD Scientific index Ltd. 2022. In addition, a staff won the first prize of the national outstanding book award from the Saudi Society of Medical Education for a book entitled "Pharmacy Education in the Twenty First Century and Beyond" in conjunction with the Saudi International Medical Education Conference (SIMEC) held at Abha 2022.

## 6. Conclusion/ Take-home message

To produce qualified pharmacists serving their patients and community; pharmacy educators (i.e., pharmacy colleges), practice regulators (e.g., SCFHS), quality bodies (e.g., NCAAA) and professional bodies (e.g., SSCP) should establish and maintain strong and effective networking and act consistently to set and update the standards of practice and decide on the priorities and top agendas in the field taking into consideration society changing needs and expectations and changes in practice globally. The pharmacy education in Saudi Arabia has witnessed a dramatic expansion longitudinally and horizontally and great achievements have been made at various levels. College of Pharmacy, Taif University is not far from this bright and cheerful picture and the college prepared itself to make further remarkable achievements soon.

## Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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