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REVIEW

Addressing inequities in pharmaceutical education with an International Pharmaceutical Federation toolkit

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Abstract

Equity in education ensures access to success-supporting tools for all, transcending backgrounds, languages, races, and more. Despite global efforts, achieving equity in higher education remains a challenge, amplified by COVID-19 in pharmaceutical education. Addressing these disparities is vital for fostering a capable, adaptable pharmaceutical workforce meeting diverse healthcare needs. The International Pharmaceutical Federation (FIP) introduces its toolkit to counter such inequities, propelling transformative changes worldwide. This narrative review outlines the toolkit, contextualising educational disparities, probing influential themes, and furnishing resources. It incorporates insights, recommendations, self-assessment tools, and expert perspectives, aiming to rectify inequities in pharmaceutical education universally and at local levels, promoting a proficient and responsive pharmaceutical workforce aligned with society's evolving healthcare demands.

Introduction

Inequity has been identified as one of the most serious issues in education worldwide and has multiple causes and consequences that correlate with the level of development of various countries and regions (Schmelkes, 2020). The correlation applies equally to higher education and incorporates inequities in

various domains including nationality, religion, background, and socio-economic status.

The COVID-19 pandemic, which brought on calamities of isolation, quarantine, and resource deficits, has unfortunately magnified educational inequalities across the globe (Sharma & Bhaskar, 2020). According to the United Nations (UN) Sustainable Development Goal (SDG) 4, Quality Education, aims to "*ensure inclusive and equitable quality education and promote lifelong learning opportunities for all*" (Department of Economic and Social Affairs, n.d.). To achieve SDG 4, the UN's Educational, Scientific, and Cultural Organisation—UNESCO's Global Education Meeting, "*Paris Declaration: A Global Call for Investing in the Futures of Education*" in 2021 emphasised the urgency to tackle the educational crises and inequalities exacerbated by the COVID-19 pandemic (Global Education Meeting, 2021). The COVID-19 pandemic led to a socioeconomic crisis with mobility restrictions and school closures, affecting education. A study in Colombia during 2020–2021 found a significant increase in learning inequality, except for gender. The paper suggests policy recommendations to address learning gaps and promote equitable education for vulnerable students (Lucas *et al*., 2023). COVID-19's impact on higher education further broadened the inequities regarding inclusion, access to, and quality of higher education.

Admittedly existent in many forms, inequities according to Ferreira, can be captured in a single phrase which appears to have the most harmful societal impact: the inequity of opportunity, the overarching conduit through which inequality is reproduced between generations (Ferreira, 2022). The inequity of opportunity on a broad scale underlies many pressing societal problems, such as crime and health disparities, leading to inequitable access to education which in turn has a negative impact on the workforce, career, and professional development. In the context of pharmaceutical education, these inequities in opportunity become particularly salient. Access to quality education and training in the pharmaceutical field may be unevenly distributed, creating disparities among aspiring pharmaceutical professionals. Students from underprivileged backgrounds or marginalised communities may face significant barriers in pursuing pharmaceutical education due to limited resources, inadequate educational infrastructure, or societal biases. As a result, they may struggle to gain the same level of knowledge, skills, and opportunities as their more privileged counterparts. Unequal access to educational resources and opportunities can limit the representation of diverse perspectives and talents within the pharmaceutical workforce. This lack of diversity not only perpetuates existing inequalities but also hampers innovation, as different backgrounds and experiences often contribute to creative problem-solving and improved patient care.

Education plays a crucial role in propelling the fields of pharmacy and pharmaceutical sciences forward to effectively address the demands of the global population. According to WHO, there can be no healthcare without a health workforce (World Health Organisation, 2014), and there is no health workforce without inclusive, equitable, and quality education. The inequities in pharmaceutical education are inextricably linked to social determinants of health and social accountability. Addressing inequities in pharmaceutical education requires addressing structural or systemic inequities, for which adequate advocacy and public policy interventions are, at minimum, a necessity. As a foundational principle in the present discussion, it is important to acknowledge that all health professions education is to produce competent and capable health professionals who will ultimately reduce health disparities, improving health for all and that the existing inequities in pharmaceutical education undercut this very purpose. Hence, it is pertinent to address these inequities in pharmaceutical education.

Highlighting the different inequities that exist and impart on pharmaceutical education, the literature shows that gender inequities exist in pharmaceutical education where women in pharmacy academia experience disparities in power, leadership, recognition, and salaries, and these issues have been exacerbated by COVID-19; proposed solutions include implementing leadership programmes, achieving gender balance, addressing pay equity, and providing bias training (Radhika *et al*., 2023). Also, there exist disparities related to education and resources where education needs to be customised to suit local conditions and expectations, indicating that a standardised educational system may not universally meet the required standards, resulting in quality disparities. There are variations in teaching, learning approaches, assessment methods pedagogical training for educators and resistance to new educational approaches. Furthermore, equitable access to resources, including study literature, laboratory facilities, practical activities, and opportunities for projects and research work, is crucial for all pharmacy students to enrich their learning experiences and skills (Bharti *et al*., 2019).

International Pharmaceutical Federation's (FIP) Development Goal (DG) 10, "*Equity and Equality*" (FIP Development Goals, n.d.), and the FIP Equity Rx programme (International Pharmaceutical Federation,

n.d.), which align with and support UN SDG 4 and the Paris Declaration, establish a transformational agenda for global pharmaceutical education stakeholders. This includes developing clear strategies for addressing equity and diversity inequalities in pharmaceutical workforce development, continued education and training, and career progression opportunities. In a focused attempt to achieve FIP DG 10, the FIP addressing inequities in pharmaceutical education toolkit (International Pharmaceutical Federation, 2022) was developed to motivate, assess, and inform forward-thinking changes targeted at transforming pharmaceutical education through addressing inequities globally, across all regions, and locally. The toolkit was designed to raise awareness about inequities as well as suggest solutions and recommendations for addressing these inequities (International Pharmaceutical Federation, 2022). The toolkit includes the publication of opinion pieces and a series of interviews that explore the inequities affecting pharmaceutical education across the six WHO regions.

Themes related to inequities in pharmaceutical education

The four themes of inequities impacting pharmaceutical education are: 1) Gender inequities; 2) Racial, ethnic, and religious inequities; 3) Resource-related inequities: and 4) Education-related inequities. These themes follow the themes referenced in major global inequity guidance documents such as the FIP Development Goals (FIP Development Goals, n.d.), the UNESCO World Inequality Database on Education (WIDE) Indicators and Disparities (UNESCO, n.d.) and the UNESCO GEM Report Scoping Progress in Education (SCOPE) Themes (GEM Report, n.d.). For regional and global insights regarding these varying themes of inequities in pharmaceutical education, a series of interviews have been reported within the toolkit from global and regional stakeholders in education, giving their perspectives of different inequities impacting education in their regions and across the globe.

Gender inequities in pharmaceutical education

Gender inequity is a worldwide issue that is increasingly being discussed in the public sphere (le Boedec *et al*., 2021), and it is crucial that women and girls have equal rights and opportunities to obtain a sustainable role in society (Bukhari *et al*., 2020). Gender inequities exist in education careers, for example, this applies to pharmacy/pharmaceutical sciences with academic women in pharmaceutical education. With an often-demanding job, in addition to often traditional roles like household and child-rearing, gender inequities are notable in pharmaceutical education, particularly in higher-level work positions. Barriers for women in academia, as described by Jean-Marie (2013) include gender, age, skin colour, and a lack of mentoring; this study showed that communities view women leaders less favourably than men, while early-career women leaders encounter age-related scepticism about their leadership abilities and are less accepted in communities. Ballenger (2010) has observed a lack of senior leadership positions for women in higher education because of higher education institutions' indifference to women's advancement (Borlik *et al*., 2021). A study in the European Union in 2019 showed that the proportion of women as heads of higher education institutions was only 23.6% compared to 21.7% in 2017 (Rosa & Clavero, 2022). Women in higher education face organisational, structural, cultural, and personal barriers to leadership (Maheshwari & Nayak, 2020). Mentoring can help female leaders in education, as it helps women build confidence and professionalism. Gender inequities impacting pharmaceutical education converge and are related to age, race, inadequate mentorship for women, and inadequate opportunities for career advancement.

Borlik and colleagues (2021) have listed over 13 practices that can enable advancement in education for women, including leadership change to end harassment and bias, training and awareness about implicit and explicit bias manifestations and intervention, and the creation of diverse, inclusive, and respectful environments. The key factors for promoting positive educational environments devoid of gender inequities include addressing gender pay gaps and work-life balance, creating supportive and safe working environments, providing opportunities for professional development, recognition, and empowerment, and supporting women in leadership (Uzman *et al*., 2022).

Racial, ethnic, and religious inequities in pharmaceutical education

Formal education is neither universal nor equal nor equitable across different racial, ethnic, and religious beliefs around the world (Pew Research Center, 2016), with studies indicating differences in educational accomplishment and attainment among different ethno-religious groups. Also, correlations exist between race, ethnicity, religion, and educational attainment, and these are partly explained by differentials such as parental endowments and social

status (Sander, 1992; Dev *et al*., 2016). There are also ethnic and religious differences in pharmaceutical education. Studies reveal that the combination of belonging to specific ethnic groups and other characteristics, such as finishing elementary or secondary education in a different country, influenced success during pharmacy training in the United Kingdom. As a result, there was a clear disparity in preregistration pharmacy trainees in 2019, when only 13% of trainees were black, resulting in a significant imbalance in the workforce (Becuwe & Reading, 2019). As reported, the underlying causes of these include a feeling of isolation among the marginalised pharmacy student population, a lack of adequate role models of similar race or ethnicity, inadequate adaptability to training in an unfamiliar environment, and language barriers.

Regarding racial and/or ethnic inequities among pharmacy faculty, Hagan and colleagues (2016) reported that in the United States of America, Whites represent the dominant ethnicity among pharmacy faculty with over 70% of pharmacy faculty. For instance, African Americans/Blacks comprised only 4.7% of pharmacy faculty, yet they comprise 13.2% of the US population. Native Hawaiian/Pacific Islanders comprised 0.1% of all faculty in US pharmacy schools, whereas they are 0.2% of the population. In contrast, Hispanics present the largest minority group in the US population at 17.1%; however, they constitute 2.9% of pharmacy faculty. American Alaska/Indian Natives accounted for 1.2% of the US population and 0.2% of US pharmacy school faculty. Asians represented 5.3% of the population and 14.5% of the faculty. This signifies a clear disparity in the distribution of pharmacy faculty. In summary, findings from the study highlighted how Asians are overrepresented in pharmacy faculty positions compared to the general population, while the rest of the ethnic minority groups are underrepresented. Indeed, The number of Underrepresented Minority (URM) pharmacy faculty members at each rank and administrative positions such as deanship positions experienced little to modest growth for over 3 decades (Chisholm-Burns *et al*., 2012).

There is a paucity of literature to exemplify ethnic, racial, and especially gender disparity for pharmacy faculty in developing countries. However, the existence of such inequities in these settings is palpable. For instance, in one of the most populous African countries Nigeria, even from the recorded number of practising pharmacists, males outnumbered females, and the worst case scenario, the practice area with the least number of pharmacists is academia with only 0.8% of the total number of the registered pharmacists in the country (Ekpenyong *et al*., 2018). Thus, by implication, will have a smaller number of female academic faculty representation.

Acknowledgement of ethno-religious differences and inequities in pharmaceutical education is the first step to addressing these inequities in pharmaceutical education. Beyond this acknowledgement is the need to close ethno-religious gaps in faculty representation (Campbell *et al*., 2021). Increasing the number of students and graduates coming from different racial backgrounds and supporting their progression to postgraduate training can provide a pool of new faculty to represent a diverse student population. Providing a path for underrepresented undergraduate students to enter the profession of pharmacy can enable a more diversified workforce and similarly diverse academic faculties to facilitate inclusion and equity for patients and students alike. Furthermore, diversifying, enhancing inclusion, and practising equity-minded pedagogy in pharmaceutical education is of particular importance to address inequities in health care globally, as both conscious and unconscious biases of healthcare professionals towards racial and religious minorities negatively impact treatment outcomes and increase the economic burden of disease globally (Dev *et al*., 2016; Bush, 2020).

Championing diversity initiatives and policies must be a collective effort across institutional leadership with responsibilities for the faculties and departmental colleagues at institutions (Chisholm-Burns, 2012). Such initiatives could include the integration of diversity, equity, and inclusion in the mission and vision of the department; the definition and demonstration of how each department faculty member fits into the overall departmental culture; and the implementation of best practices for religious accommodations to attract and retain diverse faculty members, students, and staff. Like the field of medicine (Nivet *et al*., 2016), pharmacy education is currently developing a framework for a holistic approach to incorporating diversity, equity, and inclusion into the academic curriculum, although it is not yet well established. One such approach is to incorporate cultural intelligence into the pharmacy curriculum (Minshew *et al*., 2021). This framework encompasses four domains for lifelong learning, which are cultural awareness, cultural knowledge, cultural practice, and cultural desire. An initial application of the framework indicates increased cultural intelligence, although any potential for long-term impact depends on its adoption into pharmacy school curricula. Colleges and pharmacy schools should consider incorporating diversity, inclusion, and equity as part of their mission and values to advance national and international pharmacy services.

Resource-related inequities in pharmaceutical education

Resource-related inequities in pharmaceutical education arise from financial, human capital, technological, and infrastructural issues. Low- and Middle-Income Countries (LMICs) are affected most due to inadequate resources to train students to the highest education standards. Increased research outputs and engagement of governments and private stakeholders will substantially contribute to improving equitable access to resources for pharmaceutical education. Infrastructure, finances, human resources, and technology are required to produce a well-trained and high-quality pharmaceutical workforce, and equitably accessing these resources is necessary for the provision of high-quality pharmaceutical education. Regional disparities exist despite the recognition and significance of making these resources available and accessible to all. Inequalities in pharmaceutical education disproportionately affect LMICs (Holsinger & Jacob, 2009; Liu & Ma, 2018; Beyene *et al*., 2020; Reinders *et al*., 2021). Academic pharmacists in LMICs with limited resources must maximise available resources to satisfy quality standards, however, that is challenging, and they are often overstretched. As a result, curriculum improvements are required, and many progressive schools continue to produce exceptional graduates by doing so (Council on Higher Education, 2022). Country-, institution-, and student-specific resource inequities make a "*one-size-fits-all*" approach unworkable (Anderson *et al*., 2008).

Financial inequities, which are one of the resource-related inequities, are a major concern reported in many LMICs, especially with regard to access to higher education. Higher education institutions face reduced state or government funding considering budget reallocations afflicting many countries, negatively affecting the quality of pharmaceutical education (Rhoney *et al*., 2021). Due to a lack of funding, needs-based pharmaceutical education is also poorly implemented. To bridge these gaps in finances and ensure more equitable access to quality pharmaceutical education, public-private partnerships have played an invaluable role in LMICs by providing additional funding streams to support institutions and students. A further example of resource-related inequities is the significant shortage of suitably qualified academic pharmacists to educate the next generation of pharmacists in LMICs. Potential solutions for this challenge include "*exchange*" programmes between institutions in LMICs and high-income countries, which allow for staff and students to gain exposure to more resourced settings to further build capacity in the academic pharmacy workforce (Anderson *et al*., 2008). In addition, many institutions have limited revenue streams and cannot meet the salary requirements for skilled staff (Council on Higher Education, 2022). Furthermore, in many higher education institutions, academics are encouraged to expand their research capacity. There are fewer incentives provided to academic staff to focus their development as teachers, which would significantly increase the training of high-quality pharmacists (Anderson *et al*., 2008).

Additionally, many institutions in LMICs struggle with inadequate infrastructure and equipment including an absence of conducive environments for teaching and research (e.g. poor Wi-Fi connectivity, insufficient electric supplies, or the absence of suitably qualified academic pharmacists). This has a significant impact on their pharmacy training capabilities. With the pharmacist's role evolving, new tools and strategies are needed to effectively train the pharmacy workforce. Such technologies enable traditional principles of pharmaceutical science to be visualised to enhance student learning (Curley *et al*., 2018). However, due to financial constraints, several institutions still use redundant or outdated teaching and research tools (International Pharmaceutical Federation, 2020).

The COVID-19 pandemic further marginalised students by widening the digital divide. With educational activities needing to be migrated to an online platform, institutional offerings of information and communications technology, learning management systems for online engagement, and twenty-first-century skill teaching and learning capacities were challenged. Furthermore, unequal student access to devices, data, internet connectivity, and varied digital literacy among students affected the student experience and receipt of educational material. This poses a risk to the quality of educational programmes, requiring universities to urgently address technological and digital gaps. With the recent surge in artificial intelligence and its diverse generative tools, perhaps this factor needs to be considered more meticulously, and efforts in education should be made to mitigate digital inequality in academia and avoid those who lack such resources from progressing.

The lack of these important resources restricts innovation and the development of adequately trained pharmacists, thus creating a professional barrier that creates inequity. Furthermore, financial inequality also poses a threat to disabled students where poorly resourced institutions lack resources and assistive technologies (Beyene *et al*., 2020). There is a need for governmental and private sector collaboration with stakeholders motivating active engagement to identify feasible solutions to address these inequities in pharmaceutical education through critical, adaptive,

and innovative thinking targeted at transforming pharmaceutical educational contexts globally. Other changes to address inequities in resources could be through the inclusion of higher research productivity, supervisory capacity to drive further external collaborations, and opportunities for collaborative initiatives aimed at generating new revenue sources to assist in funding challenges (Council on Higher Education, 2022). Improved research performance further uplifts the status of universities, thereby opening more funding opportunities (Brown, 2017).

Education-related inequities in pharmaceutical education

Education-related inequities cover access to education, curriculum and learning contents, learning methodologies, and their overall effect on the quality of pharmaceutical education and the pharmaceutical workforce. Educational inequities collectively lead to different access to schooling, retention, and, more importantly, the learning process (Schmelkes, 2020). While these attributes may be true for pharmacy education as for other education majors, studies from pharmacy education literature have underscored specific educational inequities as well, such as implicit or unconscious bias (Prasad-Reddy *et al*., 2022), gender inequity, sexual harassment, and specifically racial bias (Sofeso *et al*., 2022).

Educators and policymakers should be aware of the significant impact of educational inequities on the long-term employment outcomes for students, where racial and ethnic gaps can be created. In the United States, it has been shown that there exists a gap among students of underrepresented backgrounds and improving this would increase representation in the workforce and faculty (Campbell *et al*., 2021).

These can be problematic scenarios for policymakers looking to build a prepared workforce and a resilient economy. Addressing inequities in pharmacy education is a key step towards a more racially and socioeconomically diverse pharmacy workforce equipped to face health disparities and holistically provide care for diverse populations. FIP calls for all countries to have clear strategies for addressing both inequities and inadequate investment in pharmaceutical workforce development, continued education and training, and career progression opportunities. Similarly, academic pharmacy has called for the inclusion of cultural competency content and training across pharmacy curricula, with the goal of cultivating students to be aware of how their individual experiences may influence inequities (Haas-Gehres *et al*., 2021; Henson & Drame, 2022).

Pharmaceutical education in times of humanitarian crises

In times of crisis, education is frequently the first service to be suspended and the last to be restored, impacting not only students' futures but also those of their societies (UNICEF, n.d.). Education in emergencies (EiE) is essential to: help address physical, psychosocial, and cognitive needs; ensure stability and security; provide the knowledge, skills, and support needed to survive crises; contribute to individual, community, and societal resilience; and build a sustainable future (European Commission, 2019). For pharmacy schools, the COVID-19 crisis would impact experiential learning exposure which in turn would impact the pharmacist patient care process when these students enter the workforce. (Fuller *et al*., 2020). Furthermore, pharmaceutical education holds particular importance during humanitarian crises due to its role in addressing healthcare needs, medication management, public health interventions, humanitarian aid coordination, and capacity building. By ensuring the availability of skilled pharmacists, pharmaceutical education strengthens the response to crises, improves healthcare outcomes, and contributes to long-term health system resilience in affected communities. The different strategies that can be adopted specifically by pharmacy schools to deliver their programmes include didactic, laboratory/simulation, and experiential programme components during humanitarian crises. This has become especially needed after the repetitive observations of the war in Ukraine, the earthquake in Syria and Turkey, and other devastating circumstances.

For the didactic programme components, in times of crisis, a timely transition to remote or online learning is the most effective alternative to live, face-to-face formats. However, to accomplish a programme's objectives and learning outcomes, creative ways should be implemented to teach and deliver content. Whether asynchronous or synchronous, it is worth noting that, when compared to solely face-to-face settings, asynchronous settings result in greater learner involvement and superior academic performance (Northey *et al*., 2015). However, they require the technical infrastructure (internet bandwidth, electricity, smartphones, tablets, or computers) and strong digital skills (Northey *et al*., 2015).

With regards to laboratory/simulation programme components, virtual and remote laboratories provide a safe, convenient, efficient, affordable, and accessible alternative to traditional laboratories during times of crisis, removing time, geographical, and

socioeconomic constraints (Raman *et al*., 2021). Sophisticated virtual learning platforms provide viable teaching tools such as theory, procedure, animation, simulators, video, discussion boards, and resources. Moreover, the pharmacy simulation components and courses of the curriculum should include modules for humanitarian situations. Students can be prepared for such environments, for example, in pharmacy dispensing practice courses (virtual pharmacy), where real cases should be simulated, posted for students, and actively discussed with the instructors (Raman *et al*., 2021). Although virtual and remote laboratories may be more accessible during crises, they may not provide the same level of hands-on experience as traditional laboratories reducing the direct interaction and quality of the educational experience of the student.

Regarding experiential programme components, experiential education at schools of pharmacy should be tailored to fit the humanitarian situation. Pharmacy schools should also participate in alleviating the situation (Monk & Pradhan, 2019). Pharmacy practice experience courses should be transferred to a remote format, where preceptors resort to virtual meetings for students in the community and hospital internships. All case discussions, journal clubs, topic presentations, patient monitoring, and patient education assignments should be done online, but ideally, if trainees are allowed onto sites, onsite discussions should be preferred. It is critical for pharmacy schools to try to place senior trainees in experiences where emergency or humanitarian pharmacy is needed, such as disaster sites or camps with humanitarian pharmacists (Alaoui, 2020). This will add to students' learning experiences and train them for future situations. All this is conditional on the safety of the students and preceptors. Nothing should compromise trainees' safety at any point during experiential education.

Schools have a crucial role in responding to emergencies in humanitarian situations. To enhance preparedness, they should create comprehensive emergency response plans, conduct risk assessments, establish effective communication systems, provide training for staff and students, collaborate with stakeholders, and prioritise psychosocial support. Utilising resources the Inter-Agency Standing Committee Guidelines on Mental Health and Psychosocial Support in Emergency Settings provides a comprehensive framework for integrating psychosocial support in emergencies (Inter-Agency Standing Committee, 2007) Education-related inequities collectively lead to inequitable access to schooling, low student retention, and, more importantly, disrupted learning processes. Inequities in education, such as disparities in academic capacity and pedagogical approaches, have an impact on the quality of pharmaceutical education and flow into the pharmaceutical workforce, public, and health outcomes. It is important to develop crisis-sensitive, proactive, innovative, and rapid response plans to maintain education and minimise disruptions. Education systems should be prepared for and responsive to emergencies and crises while creating, implementing, and supporting education stakeholders' capacity-building and training.

Resources to address inequities in pharmaceutical education

This section covers resources to support addressing inequities in pharmaceutical education based on the FIP toolkit for addressing inequities in pharmaceutical education. This includes recommendations for educators, students and academic institutions and a self-assessment tool.

Recommendations for addressing inequities in pharmaceutical education

According to the FIP toolkit, the general recommendations for academic institutions and policymakers to address inequities in pharmaceutical education are to: collect and analyse data to identify which inequities are impacting pharmaceutical education within their institutions and practice environments; perform a situational analysis using the FIP's self-assessment toolkit or other tools available; and assess progress of education outcomes against relevant FIP descriptors. The general recommendations for addressing inequities in pharmaceutical education for educators, faculty members, and students include participation in institutional initiatives and opportunities that will identify inequities impacting pharmaceutical education and intentionally acquire the knowledge, skills, and attitudes to address these inequities in their organisations. Aligned with the specific themes addressed in the toolkit, Table I, Table II, Table III, and Table IV show the recommendations to address gender inequities; racial, ethnic, and religious inequities; resource-related inequities; and education-related inequities, respectively.

Table I: Recommendations to address gender inequities in pharmaceutical education based on stakeholders

Gender inequities	
Academic institutions/policymakers should:	**Educators, faculty members and students should:**
• Promote change and a culture that dismantles harassment and bias. • Provide mandatory training and awareness for faculty, staff, and students on gender-related issues, including implicit and explicit bias manifestations and interventions. • Provide a system that supports the creation of diverse, inclusive, and respectful environments. • Reduce gender pay disparities by requiring university leaders to compare and equalise salaries across genders with each promotion and pay increase. • Ensure there is paid parental leave, part-time options, flexible schedules, job-sharing, work at home options, onsite breast-feeding support and child-care programmes. • Facilitate the achievement of work-life balance by supporting individuals with resources and training to arrange and prioritise their work schedules flexibly. • Advocate recovery from the COVID-19 pandemic and building resilient, inclusive, innovative and gender-transformative education systems and societies. • Ensure equitable access to opportunities for professional development, recognition, and empowerment, including mentoring and continuing educational programmes. • Offer equitable access to leadership training and opportunities.	• Develop self-awareness regarding gender-related issues and bias, which could include using self-assessment tools, creating a personal career success inventory, celebrating accomplishments, and maintaining a record of positive feedback. • Participate in institutional initiatives and opportunities that will identify and address areas of gender inequities in pharmaceutical education. • Speak up and advocate for individuals facing gender inequities within pharmaceutical education. • Seek mentors and sponsors or participate in mentorship and sponsorship programmes designed to address female underrepresentation.

Table II: Recommendations to address racial, ethnic and religious inequities in pharmaceutical education based on stakeholders

Racial, ethnic and religious inequities	
Academic institutions/policymakers should:	**Educators, faculty members and students should:**
• Identify, review, and correct disparities and bias in salary and resource distribution, performance evaluation, and promotion and tenure opportunities. • Integrate diversity, equity, and inclusion into the mission and vision of the department. • Help define and demonstrate how each department faculty member fits into the overall mission and vision of the department, a philosophy that should also guide new recruits and the faculty personnel search process. • Facilitate effective mentorship programmes for faculty members. • Encourage and facilitate cross-discipline and collaborations between faculty members. • Implement best practices for religious accommodations to attract and retain diverse faculty members, students, and staff. • Utilise the diverse knowledge and skills of faculty members to help identify resource allocation needs and priority areas within the department. • Have a clear and practical diversity and inclusion charter for recruiting pharmacy faculty members to serve as role models for pharmacy students of similar ethno-religious backgrounds. • Provide an inclusive environment for all staff and students to enable them to achieve their potential. • Facilitate effective mentoring programmes for faculty members.	• Practice inclusion and build collegiality among colleagues. • Participate in institutional initiatives and opportunities that address racial, ethnic, and religious inequities in pharmaceutical education. • Intentionally acquire the knowledge, skills, and attitudes to address racial, ethnic, and religious inequities in their schools. • Speak up and advocate for individuals facing racial, ethnic, and/or religious inequities within the pharmaceutical education context.

Table III: Recommendations to address resources-related inequities in pharmaceutical education based on stakeholders

Resource-related inequities	
Academic institutions/policymakers should:	**Educators, faculty members and students should:**
• Implement strategies that maximise equitable access to existing resources for pharmaceutical education. • Build governmental and private sector partnerships that will yield the acquisition of resources. • Have and use policies that make it easier for everyone to find and develop human resources, especially in terms of academic capacity. • Develop strategies to increase resources for education and use these resources effectively to ensure inclusive and equitable quality education and promote life-long learning opportunities for all. • Advocate prioritisation, protection, and an increase in domestic finance for education. • Advocate allocation of an adequate share of national stimulus packages to education, particularly towards targeted support for marginalised learners' school (re-)enrolment, learning recovery, and socio-emotional well-being, as well as skills development for employment.	• Support and participate in institutional initiatives that aim to address resource-related inequities in pharmaceutical education. • Actively increase their self-awareness of instances of resource-related inequities and make efforts to address them among colleagues. • Advocate for the prioritisation, protection, and expansion of available resources for vulnerable and underrepresented faculty members.

Table IV: Recommendations to address education-related inequities in pharmaceutical education based on stakeholders

Education-related inequities	
Academic institutions/policymakers should:	**Educators, faculty members and students should:**
• Lead and inspire educators to seek diversity, equity, and inclusion (DEI), especially amid the COVID-19 pandemic, social challenges, physical and mental health issues, financial shortages, and inequitable access to technology. • Expand and build partnerships with laboratories, research centres, and the pharmaceutical industry to help integrate and implement diversity, where support and mentorship for the talent pool of underrepresented students is fostered. • Invest in infrastructure, technology, equipment, library facilities, laboratories, and other resources, making them available to promote an agreeable and pleasant learning environment that is equally available to all students. • Establish taskforces to address DEI in academia; through research and focus, these taskforces can recommend best practices to reduce educational inequities in pharmacy. • Assess pharmacy admissions, graduates, and alumni based on demographic factors with the purpose of encouraging applications from underrepresented student groups. • Assess the general well-being and mental health of pharmacy students, particularly those at high risk, especially with COVID-19, in situations where there is increased delivery of remote education and training. • Launch policies supporting those facing inequities in access to pharmacy education and the necessity of continuous assessment during the period of implementation, especially with ongoing political and economic changes.	• Request feedback from students regarding pedagogical approaches, experiential learning, assessments, interprofessional education, and satisfaction, with the purpose of focusing on underrepresented groups who may be at increased risk of facing educational inequalities.

Table IV: Recommendations to address education-related inequities in pharmaceutical education based on stakeholders (Continued)

Education-related inequities	
Academic institutions/policymakers should:	**Educators, faculty members and students should:**
In the case of emergencies, academic institutions and policymakers should: • Develop crisis-sensitive, proactive, innovative, and rapid response plans. • Empower education that responds to immediate learning and development needs, builds resilience, and provides life-sustaining physical, psychosocial, emotional, and cognitive support. • Ensure the continuation of accessible, inclusive, and equitable quality education. • Reduce the physical, social, institutional, financial, and academic barriers to education. • Create, support, and adapt existing frameworks for addressing education in emergencies. • Strengthen education systems to include humanitarian crisis preparedness, response, and prevention while creating, implementing, and supporting education stakeholders' capacity-building and training. • Identify and engage relevant stakeholders, education stakeholders' and students to address education inequities in emergencies.	

A self-assessment tool for addressing inequities in pharmaceutical education

The FIP toolkit for addressing inequities in pharmaceutical education contains a self-assessment toolkit intended to help increase awareness, understanding, and status of an individual academic or an academic institution regarding inequities in pharmaceutical education. It will help individuals and institutions examine and monitor attitudes and perceptions around the different inequity themes covered in this article. The Self-assessment tool as well as the FIP toolkit has been validated using the FIP internal resources validation process which includes review by stakeholders and expertise in pharmaceutical education. This will serve as a catalyst for increased self-awareness of these inequities, as well as targeted recommendations to address inequities and affect change. The self-assessment tool can be found in Section 3.2 of the FIP toolkit for addressing inequities in pharmaceutical education on the FIP website (International Pharmaceutical Federation, 2022).

Conclusion

Acknowledging the existence of inequities that impact pharmaceutical education and ultimately pharmaceutical practice and the pharmacy profession is the first step towards an equitable pharmacy workforce. Taking action to address these inequities is urgent to advance the pharmacy profession and the delivery of equitable pharmaceutical services. The FIP toolkit for addressing inequities in pharmaceutical education has assessed these issues comprehensively, unpacking specific inequity themes related to pharmaceutical education including gender, racial, ethnic, religious, resource-related and education-related inequities. It also provides opinion pieces on these themes based on real-life experience, with adequate resources including a self-assessment tool and recommendations for addressing inequities in pharmaceutical education. While further research is warranted to understand the root causes of inequities in pharmaceutical education and a more in-depth analysis of these issues, the FIP toolkit and similar initiatives pave the way towards a better understanding, recognition, and mitigation of educational inequalities.

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