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What is needed to reform pharmacy education in Jordan: An exploratory study based on a multi-stakeholder perspective

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Abstract

Background: The Jordanian pharmacy profession is facing challenges related to pharmacy education and graduates' readiness to join the workforce. The Jordanian Accreditation and Quality Assurance Commission for Higher Education Institutions has led an initiative to revise undergraduate pharmacy academic programmes. **Aim:** This study aims to capture relevant stakeholders' perceptions of factors influencing pharmacy education in Jordan. **Methods:** In March 2021, three focus group discussions were conducted with relevant stakeholders. Focus groups were thematically analysed. The "systems model of performance improvement" by Richard A. Swanson was broadly followed to interpret discerned themes. **Results:** Thematic analysis resulted in three main themes. The discerned themes represented factors related to education input variables, teaching process variables, and environmental variables. **Conclusion:** Teaching and learning processes should be shifted from educator-centred to student-centred. The academic curriculum should reflect the local context of practice and society. Future interventions should follow a holistic and comprehensive approach to reforming Jordan's pharmacy education.

Introduction

The history of the pharmacy profession in Jordan goes back to the late 1920s. According to the Jordan Pharmacists Association (JPA) database, Jordan had its first qualified pharmacist in 1929 (Jordan Pharmacists Association (JPA), 2020). In 1946, the first community pharmacy opened its doors to the public in Amman-the capital of Jordan (Al-Wazaify & Albsoul-Younes, 2005). In 1957, the Jordan Pharmacists Association established a dedicated professional body for pharmacists (Jordan Pharmacists Association (JPA), 2022). In terms of education, the first faculty of pharmacy received its first cohort in 1979 (Alefan & Alsmadi, 2017).

Over the years, the Jordanian pharmaceutical field has witnessed several developments. Jordanian

pharmacists operate in different sectors, such as community pharmacy, hospital pharmacy, medicines licensing and regulations, medicines marketing and promotion, and academia (Nazer & Tuffaha, 2017). Moreover, Jordan is considered a leading hub of the pharmaceutical industry in the Middle East and North Africa (MENA) region. There are twenty-three medicines manufacturing plants in the country, and almost 75% of nationally produced medicines are being exported to more than 80 countries worldwide (AlMamlaka TV, 2020). In terms of qualifying and training the pharmaceutical workforce, currently, more than eighteen pharmacy faculties in private and public universities offer pharmacy-related undergraduate and postgraduate programmes (Alefan & Alsmadi, 2017). Additionally, Jordan is among the countries with the highest density of pharmacists per 10,000 population,

as there are approximately twenty-one pharmacists per 10,000 population (John & Bates, 2015; Bates, *et al.*, 2018).

Despite being a thriving field, the Jordanian pharmacy profession faces many challenges. In their comprehensive evaluation of pharmacy practice and the workforce in Jordan, Bader and authors have identified the main challenges and priority areas for the pharmacy profession in Jordan. The main challenges are related to (i) quality of pharmacy education and quality assurance procedures to ensure preparing effective graduates, (ii) the gap between theory and practice in terms of graduates' readiness to join the workforce, and (iii) expansion of pharmacists' role to address the growing demands for health and pharmaceutical care (Bader *et al.*, 2017). According to Bader and authors, addressing these challenges requires a complete integration of the three main pillars that govern the profession; education, regulation, and practice (Bader *et al.*, 2017).

Being responsible for regulating and monitoring higher education in Jordan, the Jordanian Accreditation and Quality Assurance Commission for Higher Education Institutions (AQACHEI) has led an initiative to revise and update undergraduate pharmacy academic programmes and curricula. The initiative came in response to the challenges facing pharmacy education in Jordan. In 2019, the AQACHEI formed a committee of experts representing the JPA and academics from a number of pharmacy faculties in Jordan. In December 2019, the AQACHEI issued the new competency framework for Pharmacy programmes (B. Pharm. and Pharm. D.). The competency-based framework is primarily organised and structured according to the Centre for the Advancement of Pharmacy Education (CAPE) in the United States of America (USA) (Medina *et al.*, 2013). The rationale for adopting the CAPE framework was based on the fact that the majority of pharmacy faculties have been certified by the Accreditation Council for Pharmacy Education (ACPE) in the USA or are planning to submit for certification. In addition to identifying expected graduates' competencies, the AQACHEI committee identified six knowledge clusters within pharmaceutical sciences. Within each, the committee listed a number of courses faculties must offer within their curriculum (The Jordanian Accreditation and Quality Assurance Commission for Higher Education Institutions (AQACHEI), 2019).

Qualifying and training the workforce requires a holistic system that considers factors related to input, output, processes, organisational structure, and environment (R. A. Swanson, 2001). Therefore, there is a need for a framework that identifies factors related to the

educational system and describes processes needed for efficient and successful implementation.

Introducing a competency framework to reform pharmacy education is considered a step in the right direction. However, the followed approach in introducing the framework did not consider feedback and input from front-line stakeholders: employers, pharmacy students, and pharmacy graduates. Moreover, the AQACHEI framework and mandate did not discuss the measures and procedures needed to be followed to implement the framework and achieve the proposed competencies.

Accordingly, there is a need to introduce a comprehensive framework to guide pharmacy education renovation. The framework should be based on front-line stakeholders' perceptions and experiences with the pharmacy education system. In addition, the framework needs to be specific to the Jordanian context, labour market, and healthcare system.

This pilot exploratory study aims to develop a framework for pharmacy education reform in Jordan. This study was designed to capture relevant stakeholders: employers, pharmacy students, and pharmacy graduates, perceptions of factors affecting Jordan's pharmacy education, and what should be considered in future reformation interventions.

Methods

Study design

Qualitative research methods are characterised by their ability to capture rich, detailed, and descriptive personal accounts and experiences (Bryman, 2004). As this research explores relevant stakeholders' perceptions of pharmacy academic programmes, qualitative interviews were the most appropriate data collection method. Qualitative interviews enable researchers to capture participants' (interviewees) perceptions, beliefs, and experiences with the phenomenon of interest; they also allow participants to report their personal accounts of the process, dynamics, and interactions with other stakeholders within a given context (Bryman, 2004; Kvale & Brinkman, 2009). In considering interviews for data collection, a researcher must explore the most appropriate interviewing technique, whether it is a group interview (focus group) or a one-to-one interview (Creswell, 2012). Focus group design allows researchers to capture interactions and dynamics between participants and might, in some cases, highlight the differences, tensions, and conflicts.

Therefore, the focus group method was considered the most suitable data collection method, as it will allow for interactive discussions between participants and moderators.

Study participants and recruitment

Focus group discussions were conducted with twenty-seven participants. A non-probability convenience sampling was used to recruit participants from the faculty's relevant stakeholders. External stakeholders were experts and representatives of different pharmaceutical sectors, such as the community pharmacy sector, medicine licensing and regulation, pharmaceutical marketing, hospital pharmacy, industrial pharmacy, and JPA representatives. Internal stakeholders were the faculty's senior students (fifth-year students) and the faculty's graduates.

Data collection procedure

Once a participant agreed to take part in this study, the focus group date and time were discussed and agreed on. Before conducting focus groups, agreeing participants received a brief description of the study's aim and objectives, procedures, and expectations during the focus group. Additionally, participants were informed that the discussion would be audio and video recorded. However, they were assured of their anonymity and the focus group's confidentiality. In March 2021, three focus groups were convened, each with six to eight participants. The first focus group involved external stakeholders, the second involved senior students, and the third was dedicated to the faculty's graduates. In addition to external and internal stakeholders, the focus groups involved the participation of academic representatives. Academic representatives were involved in providing any clarifications needed and answering participants' questions.

Due to COVID-19 restrictions and physical distancing requirements, the focus groups were carried out virtually via Zoom video teleconferencing software. Each focus group started with a presentation that demonstrated the faculty's mission, vision, values and goals, the newly adopted competencies framework, the newly designed curriculum, and the sequence of courses. Following the introductory presentation, interactive discussions took place. The focus group discussion revolved around reviewing the proposed study plan, coherence between courses, and the extent to which the proposed study plan meets the market needs and prepares the faculty's graduates to practice. In order to have more focused discussions, the focus group followed a semi-structured approach. Table I summarises the focus group's topic guide. The topic guide acted as a prompt, reminding the moderators of

necessary topics to cover, questions to ask, and areas to probe.

Table I: Focus groups topic guide

In your opinion, is the competency framework able to meet the needs of the Jordanian market?
In your opinion, are the proposed courses capable of achieving the competencies?
In your opinion, is the plan balanced enough and able to satisfy the needs of different sectors of the pharmacy profession?

As the faculty's internal stakeholders, senior students, and graduates, were not familiar with the competency framework. They were educated and trained according to different accreditation requirements and study plans, leading the faculty to carry out a preliminary assessment survey. The survey aimed to: (i) familiarise seniors and graduates with the newly-assigned competencies, (ii) measure students' efficiency in relation to the newly-assigned competencies, and (iii) measure the gap between the proposed study plan and the previous one in order to fill any gaps between the two study plans. The survey was carried out and analysed before the conduct of the focus groups. The survey's results were summarised and shared with the internal stakeholders during their focus groups. Therefore, for internal stakeholder focus groups, a discussion point related to students' and graduates' levels of competency mastery was added to the topic guide. Lastly, at the end of each focus group, participants were asked if there was anything they would like to add or if there was anything they should have discussed but had not. Focus group discussions lasted for more than two hours; the research team assured that all participants were able to actively contribute to the discussions. All focus groups were audio-taped and transcribed verbatim.

Data analysis

Focus group transcripts were analysed inductively using the thematic analysis approach. The research team followed Braun and Clarke's thematic analysis procedure (Braun & Clarke, 2006). Firstly, the analysis process started by reading and re-reading the transcripts. Secondly, following the familiarisation phase, two authors, SAN and AIR, separately generated a list of codes and preliminary themes. Thirdly, the two authors met, compared and reviewed their codes and themes. Then a list of common codes and themes was generated and agreed on. After which agreed-upon codes and themes were checked against the

transcripts, and needed modifications were considered. Lastly, both authors came up with a possible framework that summarises the discerned themes.

Interpreting and presenting qualitative data might be facilitated and augmented if matched with an already established theory. A theory helps in arranging scattered data and themes in a more representative and understandable way by directing the researcher towards their main (focal) findings. A matching theory helps in providing a directive structure to organise and discuss data (Boudon, 1991; Dubois & Gadde, 2002). This study can be located within the education and development discipline. Therefore, human resources development theories and models could be used. Available theories discuss psychological, economic and system-related factors influencing education and human resources development (R. A. Swanson, 2001). As the AQACHEI framework and mandates addressed some aspects of the teaching process, the "systems model of performance improvement" by Richard A. Swanson was considered the most suitable analytical framework. The "systems model of performance improvement" is an open system model that describes a systematic performance enhancement and development approach. The approach is based on five main clusters of variables; input variables, process variables, output variables, organisational variables and environmental variables (R. A. Swanson, 2007).

Ethical consideration

Ethical approval has been granted by Yarmouk University, Faculty of Pharmacy deanship; Reference Number 156. The authors confirm that all methods were performed in accordance with the relevant University and International guidelines and regulations. Participants provided informed consent for the use and dissemination of data.

Results

The AQACHEI framework focused on the outcomes of pharmacy academic programmes, the desired competencies, and the expected programme learning outcomes. Moreover, as the framework was yet to be implemented, it was not possible to assess the framework outcomes. Therefore, the focus group discussions were mainly related to input and process-related variables. Inductive thematic analysis of the focus groups' data results in three main themes. Discerning themes represented factors related to education input variables, teaching process variables and environmental variables. Figure 1 is a diagrammatic representation of the discerned themes; the overall model is broadly informed by the "systems model of performance improvement" by Richard A. Swanson (Swanson. Richard A., 2007).

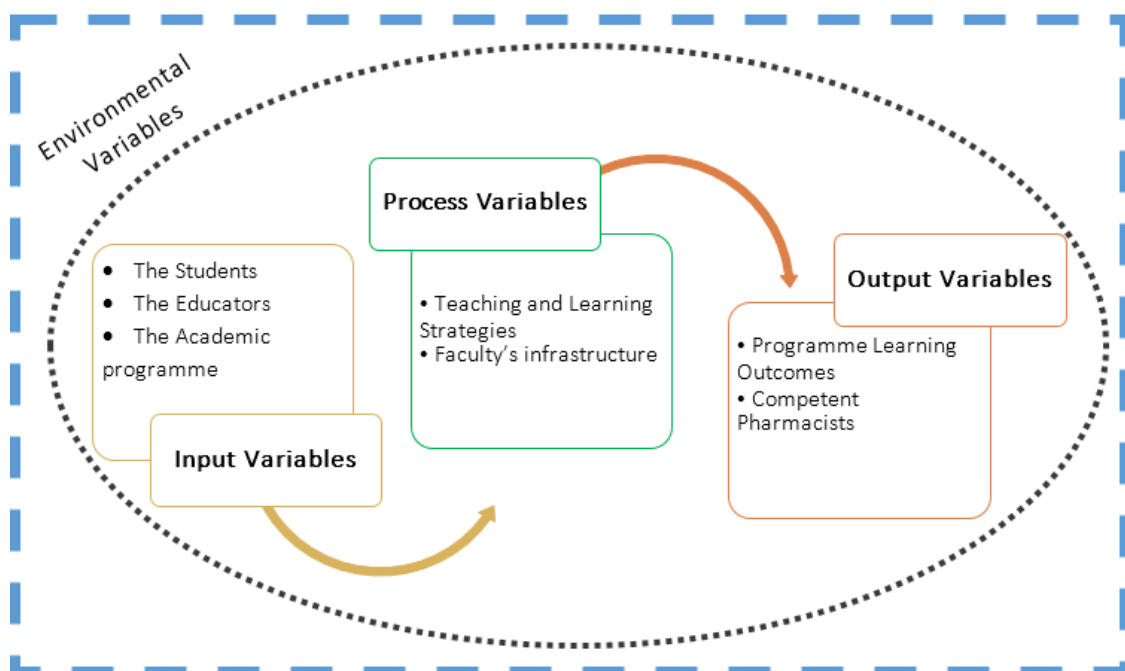


Figure 1: Diagrammatic representation of variables influencing pharmacy education

Theme one: Input variables-curriculum design

The three main input components of any academic programme are the students, the educators, and the academic curriculum (Butson, 2011). Although the new framework has identified desired competencies to be achieved by pharmacy graduates, it has not addressed aspects related to curriculum overall design. An academic curriculum is defined by its content, sequence of what learners are supposed to learn, learning and teaching approaches, and assessment and verification of acquired learning (Kelly, Kelly, & Melograno, 2004). During the discussions, participants discussed aspects related to content and individual course sequencing and integration.

Content related

The discussions highlighted three main content-related dimensions: content expansion and diversity, addressing the local context and including interpersonal and analytical skills components. Research participants, particularly external stakeholders and "sector representatives", highlighted the importance of expanding the curriculum to include unclassical pharmacy-related topics such as medicines procurement, medicinal products licensing and regulation, quality management, and pharmacy administration. Participants emphasised the significance of designing and delivering courses related to safe prescribing, dispensing, and administering nutritional supplements, vitamins, and herbal remedies. Moreover, participants discussed the rising market of medical devices and diagnostics and how pharmacists could contribute to it by using these devices in their practice settings or regulating and licensing medical devices.

"In fact, there should be a link between real practice and the theoretical knowledge studied by pharmacy students. Based on my personal experience, the curriculum should not be limited to clinical pharmacy. There is a lot a student should learn about such as quality, supply chain and medicines procurement."

Practising pharmacy influences and is influenced by the local and social context. Therefore, academic programmes should be designed to consider contextual and societal factors (Meštrović & Rouse, 2015). In addition to curriculum expansion, participants discussed the dissonance between what is taught at the universities and actual pharmacy practice. Participants emphasised the importance of redesigning the academic programme by considering the Jordanian context and pharmacy practice in Jordan. Participants discussed how the inclusion of real-life scenarios driven from the Jordanian context could augment students'

learning and enable them to excel in their practice in the future.

"As students, we need academics to link theory with practice and provide us with examples relevant to Jordanian society". "We need to be trained and taught to communicate with Jordanian patients, especially in community pharmacies settings."

Lastly, a successful curriculum should be able to develop learners' interpersonal and analytical thinking skills (Moyo & Hagmann, 2000; Hagmann et al., 2003). During focus group discussions, participants discussed the need to reorient academic programmes to include elements related to communication and analytical thinking skills development. Participants discussed how equipping pharmacy graduates with interpersonal skills could positively impact their professional practice.

"Students need to learn about teamwork, and how to communicate professionally. Also, students should be encouraged to update their knowledge through continuing education and professional development."

Sequencing and integration

Curriculum integration is a commonly followed teaching approach in medical education, including pharmacy education (Harden, Sowden, & Dunn, 1984; Wijnen-Meijer et al., 2020). Integration is defined as the "organisation of teaching matter to interrelate or unify subjects frequently taught in separate academic courses or departments" (Harden et al., 1984). Integration aims to assure continuity of learning within a specific discipline over time (vertical integration) or harmonisation and compatibility of content between different disciplines at the same level (horizontal integration) (The Global Centre of Excellence in Curriculum and Related Matters (IBE-UNESCO), 2012).

Participants, mainly senior students and graduates, discussed how appropriate integration between courses helped them learn holistically and coherently and allowed for connections to be made within and across different subjects of pharmaceutical sciences. Students and graduates discussed that, unlike unintegrated courses, properly integrated courses enabled them to (i) achieve good information retention, (ii) accumulate and develop their knowledge and skills, and (iii) transfer gained knowledge and developed skills into more advanced theoretical and practical courses.

"Now, the previous study plan covered most of the pharmaceutical sciences-related topics. However, there was an issue with course sequencing. At some point, we studied advanced

concepts and topics without covering basic knowledge first. It was a bit confusing; sometimes, we could not understand why we were studying certain topics."

Theme two: Process variables

The performance improvement process is based on strategic, structural, technological, and human resources factors (R. Swanson, 2007). In addition to discussing elements related to curriculum design, participants addressed aspects related to the execution and implementation of the academic curriculum. Participants addressed how the teaching approaches and strategies and the faculty's infrastructure could influence the successful implementation of the pharmacy curriculum. Participants discussed how the divergence from traditional teaching approaches could contribute to achieving context-specific learning and help create a link between theory and practice. Participants discussed how following a learning-by-doing teaching approach could play an active role in learning and help students be more engaged with the academic content.

"One year, I did a student-exchange programme in Spain. The whole experience was different. There, they do not tell you what to do in the laboratories. Instead, Spanish academics asked us to explore, try, and make mistakes. There, we learned by making mistakes and trying to find solutions. Academics guided us; they did not tell us what to do."

In addition to teaching and learning strategies, participants, mainly senior students, highlighted the importance and the impact of the faculty's infrastructure. Infrastructure is an influential operational input of any academic programme. Infrastructure includes elements necessary for teaching and learning, such as buildings and equipment (Subair, Okotoni, & Adebakin, 2012). During discussions, participants emphasised that having properly equipped laboratories contribute to achieving intended learning outcomes and enhancing students' overall academic experience.

"About the laboratories, during our time at the Faculty, the laboratories were not equipped. Moreover, we did not receive sufficient clarifications and guidelines during practical sessions. Sometimes, we did not even have practical sessions; the experiments were explained to us theoretically."

Theme three: Environmental variables

While the focus group discussions were mainly centred on the curriculum design and teaching process, the external environment's effect was also addressed. The external environment could strengthen or compromise an academic programme and its outcomes (Thomas et al., 2014). The effect of the external environment was evident when the participants discussed experiential practice at community pharmacies. In Jordan, pharmacists need to complete 1,440 training hours at a pharmaceutical organisation as a licensing requirement. Usually, Jordanian pharmacy faculties support their students by offering training courses (pharmacy practice experience (PPE) courses) that account for 320 to 360 hours in community pharmacy settings. During PPE courses, students are requested to go through commercially available medicinal products used in treating and managing diseases and conditions discussed in the theoretical courses. Students are also encouraged to observe and be involved with actual patients and healthcare providers. Moreover, students are requested to discuss their observations and experiences with their academic supervisors and preceptors.

"Regarding experiential training, the number of pharmacy students we train each year is overwhelming. Honestly, we do not have enough places to train students. Faculties need to encourage and motivate practising community pharmacists to train students. Pharmacists trainers should be involved in student's assessment and evaluation".

Focus group discussions showed that the successful implementation of PPE courses is influenced by the complex interplay of different factors related to proper coordination between faculties and training sites, availability of agreed-upon training programmes between faculties and community pharmacies, the capacity of pharmacies; and willingness of practising community pharmacists to train and mentor pharmacy students.

Discussion

This study was carried out to understand factors influencing pharmacy education in Jordan. In addition, the study aimed to provide a framework that could be used to guide pharmacy education interventions and programmes in the future. Thematic analysis and mapping of focus group transcripts using Richard A. Swanson's model of "systems performance improvement" has resulted in three discerned themes: (i) education input-curriculum design, (ii) Process-

related variables, and (iii) environmental variables. Furthermore, results showed that achieving desired outcomes and graduating ready-to-practice competent pharmacists is based on a complicated multifactorial process.

The reform of pharmacy education is one of the main priorities of the pharmacy profession in Jordan. Pharmacy education needs to undergo continuous systematics and holistic development (Katajavuori *et al.*, 2009). Therefore, any reform initiatives and interventions should be able to enhance the overall quality of the educational system by addressing elements related to input, process, and output variables (Blackmur, 2007; Udam & Heidmets, 2013).

The new competency framework's introduction could be considered a step in the right direction, as the AQACHEI has defined needed learning outcomes and desired competencies to be achieved and acquired by pharmacy graduates. However, the AQACHEI has not addressed elements related to the learning and teaching process and its input variables. The teaching and learning process is based on a number of variables related to curriculum design and delivery and teaching and assessment approaches (Van Damme, 2004; Westerheijden, 2007). This study's findings emphasised the role of curriculum design in achieving desired outcomes and competencies. In theory, an innovative and well-designed curriculum could substantially better improve learning outcomes. Results showed that for achieving learning outcomes and competencies, the curriculum should be able to address the context in which graduates are going to practice, community needs, available opportunities and challenges (Koster, Schalekamp, & Meijerman, 2017; Meijerman, Blom, & Schalekamp). Developing a context-specific curriculum and discussing real-life scenarios will provide graduates with the applied knowledge to augment and support their theoretical knowledge (Ntshoe, 2015).

Recently, the pharmacy profession has expanded in scope to include pharmaceutical value chain such as research and development, manufacturing, procurement and supply management, health technology assessment, and medicines regulation and licensing (Aitken, 2016; Hafner, Walkowiak, Lee, & Aboagye-Nyame, 2017; Volmer, Sepp, Raal, & Atkinson, 2019). Therefore, academic curricula should be expanded to include aspects related to the pharmaceutical value chain. The research participants indicated that broadening the curriculum could help pharmacists support national healthcare systems and secure better employment opportunities after graduation.

Another aspect that should be considered in designing an innovative curriculum is the integration of courses

and modules. The integration ensures the continuity and the accumulation of knowledge and skills (The Global Centre of Excellence in Curriculum and Related Matters (IBE-UNESCO), 2012). Adopting an integrative approach in designing a curriculum could provide students with an educational experience that is coherent, relevant, and engaging (Pearson & Hubball, 2012).

In addition to the curriculum design, the quality of pharmacy education is dependent on the teaching and learning process. Available literature indicates that the success of the teaching and learning process is influenced by a number of factors such as (i) the overall quality of teaching approaches and (ii) students' expectations and experiences (Brauer & Ferguson, 2015; Husband, Todd, & Fulton, 2014), (iii) the link and balance between the theory-based courses and practice-based courses (Jesson, Langley, Wilson, & Hatfield, 2006; McRobbie, 2004; Skau, 2007), (iv) emphasis on developing students' practical and clinical skills (McRobbie, 2004), and (v) the adoption of experiential, problem-based learning and case-based learning (Laksov, McGrath, & Josephson, 2014). The study's findings pointed out how the deployment and the integration of these factors could contribute to competency development, the achievement of learning outcomes and help pharmacy graduates maximise their impact in serving and supporting the national healthcare system.

While curriculum design and teaching approaches are the two main pillars of the educational process, the infrastructure of pharmacy faculties significantly impacts students' overall experiences (Anderson *et al.*, 2009). Sufficiently equipped laboratory facilities are necessary for pharmacy students to develop their skills and allow them to practice and strengthen their skills (Olson *et al.*, 2022). Similar to other universities and faculties in middle-income countries, Jordanian universities and faculties are challenged by limited financial resources, a lack of funds for research projects, and the absence of research leadership (Anderson *et al.*, 2009; Gebremariam & Gadisa, 2021). This study highlighted the importance of equipping laboratories and facilities with state-of-art equipment and instruments in achieving desired competencies and programme learning outcomes.

The effect of the external environment was evident in experiential training courses. Similar to available literature, Jordanian pharmacy students are faced with several barriers that could hinder their development and learning during experiential training courses. These barriers are related to the limited placements in training sites, unavailability of clinical preceptors, training quality assurance mechanisms and

coordination between pharmacy faculties and training sites (Danielson *et al.*, 2015; Bader *et al.*, 2017; Bajis *et al.*, 2018). Therefore, pharmacy faculties need to rethink and redesign their experiential training courses and closely monitor the execution of these courses. Moreover, pharmacy faculties should consider ongoing communication with training sites, mainly community pharmacies, and harmonisation between teaching and learning activities.

As a profession, pharmacy carries medical and humanistic aspects that affect everyone's life regardless of gender, race, and socioeconomic status. Pharmacy graduates' readiness to practice is among the main challenges facing the pharmacy profession in Jordan. To what extent does pharmacy education prepare students for the workforce? This question has been asked and addressed by many scholars worldwide. This study aimed to provide a roadmap for the reform of pharmacy education in Jordan.

This study has provided a broad framework for pharmacy education reform in Jordan. The study has defined some of the output, process, and input variables that could influence pharmacy education. While the study's results provided good insights related to the pharmacy education process, it has not addressed the main component of the education process, such as students, admission mechanisms, pharmacy educators, legislative and regulatory considerations, and the labour market.

Therefore, further studies are needed to identify the critical elements of future interventions to reform pharmacy education in Jordan. Moreover, any future study or research projects need to address the envisioned future of pharmacy practice in different sectors and specialities. Finally, as the competency framework is very recent and yet to be implemented, focus group discussions have not provided sufficient details related to the ability of the newly introduced competency framework to meet the needs of the Jordanian market. Therefore, future studies and research projects should consider the framework implementation and outcomes.

Conclusion

The reform of pharmacy education should follow a holistic, systematic, and evidence-based approach. An innovative and need-based educational programme should be able to address the national context and develop student's theoretical knowledge, practical skills and interpersonal and behavioural skills. Furthermore, regulators of pharmacy education should

include relevant stakeholders in future interventions. Including relevant stakeholders could provide regulators with insights related to the national context of pharmacy practice in Jordan.

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