


RESEARCH ARTICLE

Perspectives of pharmacy students towards academic programs accreditation: A focus on awareness, perception and attitude

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Abstract

Background: The accreditation of pharmacy programmes is essential for maintaining educational quality in academic institutions, entailing a systematic evaluation process. This study examines the perspectives of pharmacy students (i.e. awareness, perception and attitude) towards academic programme accreditation. **Methods:** A cross-sectional study surveyed Doctor of Pharmacy (Pharm.D.) students at King Saud University, Riyadh, Saudi Arabia, towards accreditation of academic programmes. Data from 112 participants were collected via a structured questionnaire covering demographics, awareness evaluation, and perception and attitude assessment. **Results:** The study included male (56.30%) and female (43.70%) students from different academic years. 38.40% demonstrated comprehensive awareness of the accreditation process, with significant variation across academic years ($p < 0.001$). 54.50% had a general awareness of accreditation, but 74.10% lacked formal orientation from their institutions. Over half (53.60%) knew their program's accreditation status, but many were unclear about accreditation requirements. Only 38.40% were aware of other accredited pharmacy programs. The study revealed a generally positive outlook on accreditation, with different perceptions about its importance across academic levels. **Conclusion:** The present study revealed a significantly improved trend in students' awareness of accreditation by academic level, demonstrating that awareness level increases with each academic year. Educational strategies that deepen students' awareness of the accreditation process are needed.

Introduction

Pharmacy education stands as one of the cornerstones of healthcare, with the training of pharmacists holding a pivotal role in safeguarding public health (Manolakis & Skelton, 2010; Anderson & Arakawa, 2021). Ensuring that future pharmacists receive a comprehensive and high-quality education is of paramount importance (Anderson & Arakawa, 2021). Therefore, accreditation of pharmacy programmes serves as a critical mechanism for this assurance, systematically evaluating and verifying the quality of education provided by academic institutions (Janke *et al.*, 2013). Accreditation agencies, such as the Accreditation Council for Pharmacy Education (ACPE) in the United States and their international counterparts, play a vital

role in establishing and maintaining rigorous standards for pharmacy education worldwide (Fathelrahman *et al.*, 2022). In pursuing excellence, accreditation agencies set forth criteria encompassing curriculum design, faculty qualifications, resources, and student outcomes (Alkatheri *et al.*, 2019; Wilby *et al.*, 2019). Through rigorous assessment processes, they ensure that pharmacy programmes are aligned with evolving healthcare needs, fostering continuous improvement and innovation in education. Accreditation is more than a badge of quality; it is a dynamic process that shapes the educational landscape, influences institutional policies, and ultimately impacts the preparedness of pharmacy graduates for the complexities of modern healthcare practice (Wilby *et al.*, 2019). At the heart of this complicated ecosystem lie the pharmacy students,

the primary beneficiaries of accredited programmes. Their knowledge about the accreditation process and their attitudes towards it are fundamental elements that can profoundly influence the effectiveness of accreditation as a quality assurance mechanism (Wilby *et al.*, 2019). Moreover, pharmacy students represent the next generation of healthcare professionals, and their understanding of accreditation affects their educational experiences and carries implications for the entire pharmacy profession (Alfadi *et al.*, 2022; Fathelrahman *et al.*, 2022).

In a globalised world where healthcare challenges transcend borders, the standards of pharmacy education must also transcend national boundaries (Taylor, 2017). While administered locally, accreditation processes often draw from and contribute to international best practices. As such, pharmacy education accreditation is a dynamic field that evolves in response to global healthcare trends, scientific advancements, and educational innovations. In countries such as the United States, Canada, and the United Kingdom, accreditation of pharmacy programmes has been integral to ensuring the quality and consistency of pharmacy education for decades (Alkhateeb *et al.*, 2018). Research in these regions has explored the perceptions of students, faculty, and practitioners regarding the value of accreditation (Alkhenizan & Shaw, 2012; Al-Shareef *et al.*, 2023). These studies have yielded a significant understanding of how accreditation can influence education and practice, offering a basis for scrutinising similar circumstances globally (Wilby *et al.*, 2019).

Accreditation is significant and persuasive from the perspective of pharmacy students for a number of reasons. Despite anything else, students can get the maximum from approved programmes. When students have a positive impression of their programme, they are more likely to be engaged, follow the rules, and help make changes for the better (Alkhenizan & Shaw, 2012). The honesty and excellence of the pharmacy profession depend on students' schooling experience, which influences their dedication to lifelong learning, standards adherence, and professional conduct in the future (Wilby *et al.*, 2019). The best way for institutions to improve their instructional programmes to raise student understanding and appreciation of accrediting processes is to understand how students perceive these processes. In fact, the perceptions of stakeholders, such as students, teachers, and practitioners, are crucial to the acceptance and effectiveness of accrediting processes (Anderson & Arakawa, 2021; Al-Shareef *et al.*, 2023). When stakeholders have a positive impression of accreditation, it improves the implementation and adherence to standards, which in turn leads to better

educational results (Manolakis & Skelton, 2010; Janke *et al.*, 2013).

In Saudi Arabia, the landscape of healthcare and education is undergoing significant transformation (Alasiri & Mohammed, 2022). There have been substantial investments in its education and healthcare sectors to align with Vision 2030, a strategic framework aimed at diversifying the national economy and promoting a vibrant and healthy society (Alasiri & Mohammed, 2022). In this context, national educational institutions play a pivotal role in shaping the future of healthcare professionals, including pharmacists. Therefore, understanding the awareness and attitudes of pharmacy students towards pharmacy programme accreditation is crucial for several reasons. Pharmacy programmes, which contribute to the country's healthcare workforce development, must meet the highest standards of quality and relevance (Almaghaslah & Alsayari, 2021). Therefore, assessing the perceptions and awareness of accreditation among pharmacy students can inform universities' ongoing efforts to maintain and enhance the quality of their pharmacy education. It can also contribute to the broader conversation about the role of the national accreditation bodies and their alignment with international standards (Almaghaslah & Alsayari, 2021). In this study, the perspectives of pharmacy students (i.e. awareness, perception and attitude) on academic programme accreditation were explored. By examining their perspectives, a contribution to the ongoing discourse surrounding the role of accreditation in pharmacy education and identifying opportunities for improvement in the educational experiences of future pharmacists was deemed necessary. It also highlights the importance of understanding students' perspectives in the ever-evolving landscape of pharmacy education and accreditation.

Methods

Study design

This is a cross-sectional study conducted employing a well-structured questionnaire as the primary data collection instrument. The questionnaire was rigorously developed with the aim of ensuring both reliability and relevance. This process involved an initial literature review to identify key areas of investigation and inform the questionnaire's content. The target population for this study comprised Doctor of Pharmacy (Pharm.D.) students at King Saud University (KSU), Riyadh, Saudi Arabia. The study was approved by the institution's ethical committee (IRB Approval of Research Project No. E-22-7450). To ensure a comprehensive understanding,

the questionnaire was constructed following an extensive review of existing literature and was divided into three distinct sections: demographic information, awareness assessment, and perception and attitude assessment. The awareness score was calculated as a composite score based on responses to seven awareness questions, rated on a scale of 1 to 3 (1: Yes, 2: No, 3: Not Sure). Perception and attitude scores followed a similar rating scale, with 1 representing positive, 2 for neutral, and 3 for negative responses. The questionnaire was distributed electronically to ensure the widest participation of students. The participation was voluntary, with an emphasis on the option to withdraw at any time without consequence. It is important to note that the present study encompassed Pharm.D. students from the second to sixth academic levels, excluding first-year students who were undergoing general university preparatory courses. This exclusion criterion was implemented to focus on students who have commenced their specific pharmacy education.

Statistical analysis

The collected raw data underwent rigorous processing, and a comprehensive statistical analysis was carried out using SPSS version 26. Descriptive statistics, such as mean, were used to present continuous variables, while categorical variables were expressed in terms of percentages. In order to assess differences between various groups within the study, statistical tests, including the Chi-Square test, were employed depending on the nature of the variable being examined. Notably, statistical significance was declared when the p-value was less than 0.05, indicating a threshold below which results were considered significant.

Results

A total of 112 pharmacy students from different academic levels, representing 44% of the sampled pharmacy students (n = 250), participated in the survey during the 2022 academic year. This participation rate indicates a substantial proportion of the student body, providing a robust sample for the study's analysis. Table I shows the baseline characteristics of the respondents. The participants comprised 63 males (56.30%) and 49 females (43.70%). The age distribution was as follows: 17-19 years (17%), 20-22 years (41%), and 23-25 years (42%). The distribution of participants across academic levels was relatively balanced, with the majority being in their sixth professional year (22.30%), followed by the fourth year (20.50%), second year (19.60%), third year (18.80%), and fifth year (18.80%). It is noteworthy

that first-year students engaged in university general preparatory courses were not included in the study.

Table I: Demographic characteristics of pharmacy students of different academic levels

Variable	Demographics	
	Frequency (n)	Percentage (%)
Gender		
Total	112	100
Male	63	56.30
Female	49	43.80
Age		
17-19	19	17
20-22	46	41
23-25	47	42
Academic level		
2 nd Year	22	19.60
3 rd Year	21	18.80
4 th Year	23	20.50
5 th Year	21	18.80
6 th Year	25	22.30

The study investigated the awareness levels of pharmacy students concerning pharmacy programme accreditation. Table II shows the aggregated data on awareness and attitude towards accreditation. A good awareness of accreditation was observed by 38.40% of respondents. Notably, variations in awareness were observed across different academic levels, which was statistically significant ($p < 0.001$) (Figure 1). Survey responses revealed that 54.50% had heard about academic programmes accreditation through elective workshops and seminars. Nevertheless, the majority (74.10%) had not been formally introduced or oriented to programme accreditation by the college. Furthermore, while 53.60% were aware of the accreditation status of their Pharm.D. programme, a substantial portion (65.20%) were unsure about the basic requirements for programme accreditation. The awareness of accredited other national pharmacy programmes was limited, with only 38.40% acknowledging their existence. Additionally, there was uncertainty among respondents regarding whether accreditation is mandatory for pharmacy colleges. Interestingly, despite these findings, 29.50% believed programme accreditation is requisite or mandatory for such colleges. Moreover, (38.4%) were aware of any international accredited pharmacy programmes. The gender-based analysis suggests that male students reported more positive awareness of accreditation than female students. Specifically, 53.60% of male students perceived joining an accredited programme as

important, compared to 42.90% of female students. Notably, the mean awareness score varied significantly

among different academic levels, with an increasing awareness trend by study year ($p < 0.001$).

Table II: Aggregated data on awareness and attitude towards accreditation

No.	Awareness	Yes (%)		No (%)		Not sure (%)	
		Male	Female	Male	Female	Male	Female
1	Have you heard about academic programmes accreditation?	55	26	24	19	4	4
2	Have you ever been introduced/orientated to programme accreditation by your college?	7	3	45	38	11	8
3	Are you aware if the pharmacy program at KSU is academically accredited?	35	25	7	6	21	18
4	Are you aware what are the basic requirements for academic programmes accreditation?	6	9	13	15	44	29
5	Are you aware of any accredited pharmacy programme in Saudi Arabia?	25	18	10	12	28	19
6	Are you aware if that programme accreditation is mandatory for colleges of pharmacy in Saudi Arabia?	21	12	9	13	33	24
7	Are you aware if that programme accreditation is mandatory for colleges of pharmacy in Saudi Arabia?	26	17	12	16	25	16

No.	Attitude	Positive (%)		Neutral (%)		Negative (%)	
		Male	Female	Male	Female	Male	Female
1	Joining an accredited pharmacy programme is important	53.6	42.9	2.7	0.9	0	0
2	Accreditation of academic programmes should be mandatory for all colleges of pharmacy in Saudi Arabia	50	41.1	3.6	0	2.7	2.7
3	Pharmacy programme accreditation is important for your future career	52.7	42.9	3.6	0	0	0.9
4	Graduating from an accredited pharmacy programme should be a criterion for acceptance in post-graduate training such as a residency programme	46.4	33.9	7.1	3.6	2.7	6.3
5	Participating in a pharmacy programme accreditation project will help to improve your ability to work and think independently	52.7	40.2	2.7	2.7	0.9	0.9
6	Pharmacy accreditation programme distinguishes me from students at other universities	55.4	42	0.9	1.8	0	0
7	I feel that pharmacy programmes accreditation will help in the profession of Pharmacy development	52.7	42.9	2.7	0	0.9	0.9

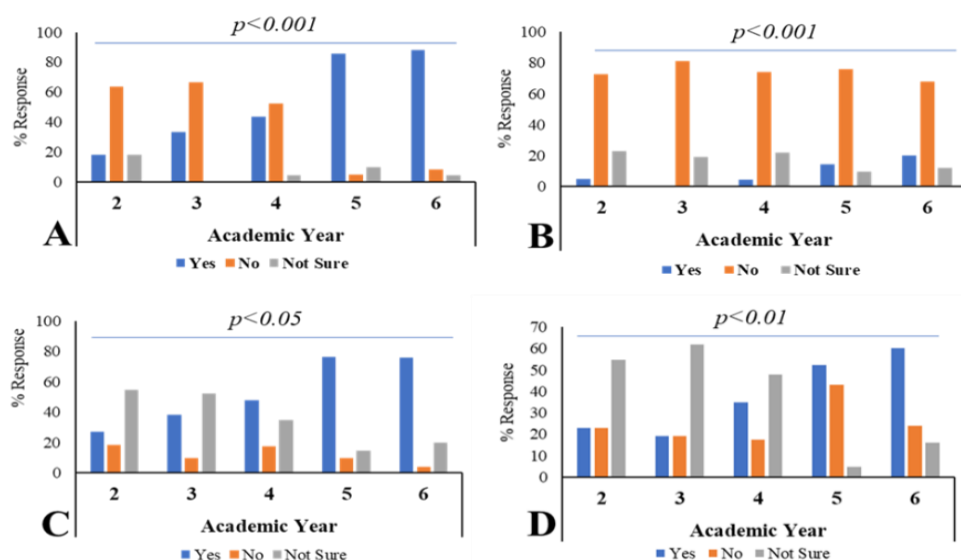


Figure 1: Awareness and knowledge of academic programme accreditation among pharmacy students. (A) General awareness of academic programme accreditation, (B) Introduction or orientation to programme accreditation provided by the college, (C) Knowledge about the accreditation status of their pharmacy programme, and (D) Awareness of the requisite or mandatory nature of programme accreditation for national colleges of pharmacy.

Exploring the perception and attitudes of pharmacy students toward pharmacy programme accreditation, this study uncovered some insights. The majority of students had favourable opinions about the accreditation in a number of areas. Joining an accredited pharmacy programme is important, according to the majority of male students (53.60%) and a lower percentage of female students (42.90%). This difference was statistically valid across academic levels ($p < 0.05$; Figure 2A). Similar percentages of students (52.70% of males and 42.90% of females) acknowledged the importance of academic accreditation for their future careers. In addition, about half of male students and 41.10% of female students thought that accreditation should be required from

colleges. In addition, the belief that graduation from an accredited programme should be a condition for post-graduate training varied by gender (46.40% males vs. 33.90% females), which was statistically significant by academic levels ($p < 0.05$; Figure 2B). Nevertheless, gender differences were not statistically significant in the perceptions that involvement in accreditation projects fosters independent thought and work or that accreditation sets them apart from other university students. Eventually, a comparable number of male and female students (52.70% and 42.90%, respectively) believed that accreditation would advance the pharmacy profession, demonstrating a generally favourable attitude toward accreditation.

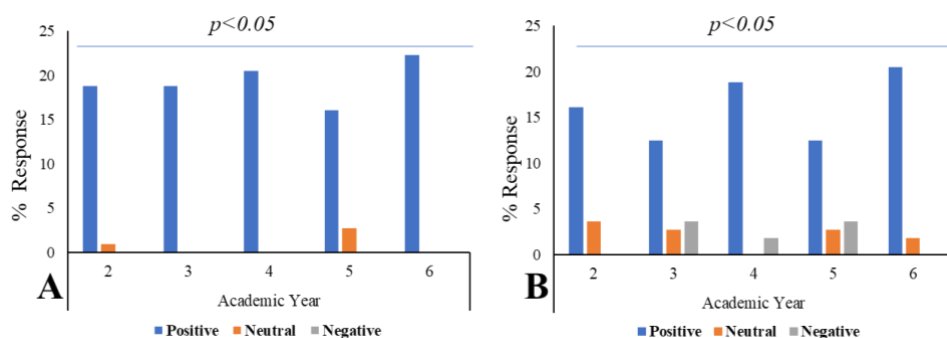


Figure 2: Attitude scores of pharmacy students towards pharmacy programmes accreditation. (A) Joining an accredited pharmacy programme is important. (B) Graduating from an accredited pharmacy programme should be a criterion for acceptance in post-graduate training such as a residency programme.

Discussion

This study was set out to evaluate pharmacy students' awareness, perception and attitudes on the accreditation of pharmacy programmes. The present analysis indicates that while respondents demonstrate a positive attitude towards the importance of pharmacy programme accreditation, the depth of their awareness varies across different domains. Specifically, while there is a general awareness of accreditation, information on its criteria and implications shows variability among the respondents. This suggests a gap between the recognition of accreditation's value and a comprehensive understanding of its processes and benefits. Students' awareness differed greatly across academic levels. This result implies that students may become increasingly familiar with information regarding programme accreditation as they proceed through their pharmacy school. This emphasises the necessity of early educational programmes and interventions to improve students' awareness and comprehension of pharmacy

programme accreditation during the course of their academic careers.

The present findings showed that respondents' attitudes about pharmacy programme accreditation were largely favourable, while their general awareness was relatively limited. A significant portion of participants, 53.60% of male and 42.90% of female students, recognised the importance of enrolling in an accredited school. Similarly, about half of the male students (52.70%) and a smaller proportion of female students (41.10%) believed that accreditation should be a mandatory requirement nationwide. The present study's findings indicate that male students tend to have a more positive awareness of accreditation than female students. This is reflected in their responses regarding the importance of joining an accredited programme and understanding the benefits of accreditation. The observed differences may be influenced by various factors, including differences in educational experiences and cultural contexts. Accordingly, students are aware of the importance and usefulness of programme accreditation in guaranteeing

the calibre and standards of their education. Additionally, the respondents indicated a favourable opinion of the advantages of accreditation by expressing the opinion that taking part in an accreditation project for a pharmacy programme can enhance their capacity for independent thought and work. It is noteworthy that a sizeable fraction of the participants expressed ambiguity regarding the extent to which their participation in the pharmacy accreditation programme sets them apart from students at other universities. This ambiguity could be linked to a vague understanding of the particular benefits and distinctive elements connected to the programme accreditation process. By contrasting these results with previous studies, it is clear that pharmacy students' awareness and perception of programme accreditation vary depending on the setting (Naughton & Friesner, 2012; Wilby *et al.*, 2019; Nelson *et al.*, 2021).

Pharmacy students have been found to have comparable low levels of awareness, while other studies have revealed better levels of awareness and comprehension (Alduraibi & Altowayan, 2022; Alfian *et al.*, 2023). Cultural disparities, exposure to awareness about accreditation, and educational curriculum are a few possible factors influencing these discrepancies (Przymuszala *et al.*, 2023; Watanabe *et al.*, 2023). Interventions should be carried out at different stages in order to close the awareness gap and enhance pharmacy students' attitudes about programme accreditation (Jin *et al.*, 2019; Makrygianni *et al.*, 2023). Programme accreditation, its significance, and the related procedures should be covered in specific courses or modules that are included in pharmacy curricula (Pearson & Hubball, 2012; Hu & Cao, 2023). It is also possible to arrange awareness campaigns, seminars, and workshops to involve students and encourage a positive attitude toward accreditation (Kerr *et al.*, 2020). Establishing a culture of accreditation awareness and ongoing quality improvement can also be greatly aided by cooperation between academic institutions, regulatory agencies, and professional associations (Keshishian & Brenton, 2015; McManus *et al.*, 2019). It is crucial to emphasise, nonetheless, that this study revealed a range of awareness within the Pharm.D. programme levels, indicating a gradual development in understanding as students advance through their pharmacy school. The current findings on respondents' attitudes toward programme accreditation for pharmacy students were largely positive, which is in line with earlier research findings (Fathelrahman *et al.*, 2022). The majority of participants believe that enrolling in an accredited pharmacy programme is essential and that accreditation should be mandatory for all pharmacy academic institutions. This positive perception by students aligns with their recognition of the importance

of programme accreditation in ensuring the quality and standards of their education (Alkhateeb *et al.*, 2018). However, a significant portion of the participants was uncertain whether their enrollment in the pharmacy accreditation programme distinguished them from students at other colleges. As highlighted by Alkhateeb and colleagues (2018), there is a need to provide pharmacy students with more information and insights regarding the potential benefits and professional advantages of studying in accredited colleges.

A diverse approach is therefore necessary to fill the knowledge gap and increase awareness of programme accreditation among pharmacy students. This includes dedicated courses or modules in the pharmacy curriculum that can help students gain a thorough understanding of the accreditation process, its importance, and its specific requirements. Interactive seminars and expert lectures can further enhance student awareness and understanding. Programmes for mentoring faculty members can also help students through this experience. Public awareness campaigns can emphasise the value of accreditation by outlining the advantages of attending recognised academic programmes such as higher quality education, more job opportunities, professional licensing eligibility, and educational financial aid. Using social media platforms might help students to have interactive sessions and discussions during this process. Nonetheless, it is important to take into account how standardised accreditation could affect the originality and creativity of pharmacy education in different universities.

Limitations

This study has a few limitations; this includes its focus on a single institution, which may affect the generalisability of the findings across different educational contexts. Furthermore, the survey response rate was 44%, suggesting a potential for non-response bias, which could influence the results. Future work may address these limitations by involving multiple institutions, improving response rates, and employing a mixed-methods approach to deepen the exploration of pharmacy students' perspectives on accreditation.

Conclusion

The present study reveals a notable awareness gap among pharmacy students regarding the accreditation of pharmacy programmes despite a generally positive view towards its importance. These findings underscore the urgent need for targeted educational interventions to enhance students' understanding and

appreciation of accreditation's role in ensuring quality education and supporting the profession's standards. By improving educational efforts and leveraging insights from the present work, pharmacy education institutions can better prepare students to actively contribute to the development and quality assurance of pharmacy programmes. Implementing these initiatives will not only close the awareness gap but also foster a more informed and positive perspective towards accreditation, ultimately advancing the field of pharmacy education.

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Conflict of interest

The authors declare no conflict of interest.

References

- Al-Shareef, A. S., AlQurashi, M. A., Al Jabarti, A., Alnajjar, H., Alanazi, A. A., Almoamary, M., . . . Alqarni, K. (2023). Perception of the accreditation of the National Commission for Academic Accreditation and Assessment at different health colleges in Jeddah, Saudi Arabia. *Cureus*, **15**(8), e43871. <https://doi.org/10.7759/cureus.43871>
- Alasiri, A. A., & Mohammed, V. (2022). Healthcare transformation in Saudi Arabia: An overview since the launch of vision 2030. *Health services insights*, **15**, 11786329221121214. <https://doi.org/10.1177/11786329221121214>
- Alduraibi, R. K., & Altowayan, W. M. (2022). A cross-sectional survey: Knowledge, attitudes, and practices of self-medication in medical and pharmacy students. *BMC Health Services Research*, **22**, 352. <https://doi.org/10.1186/s12913-022-07704-0>
- Alfadl, A. A., Siddeeg, K., Anaam, M. S., Alharbi, R. A., Aljutayli, M. A., & Alsaheed, H. M. (2022). Saudi pharmacy students' perceived knowledge and attitude on their role in public health services. *International Journal of Pharmacy Practice*, **30**(5), 472–478. <https://doi.org/10.1093/ijpp/riac029>
- Alfian, S. D., Khoiry, Q. A., Andhika, A. P. M., Pradipta, I. S., Kristina, S. A., Zairina, E., . . . Abdulah, R. (2023). Knowledge, perception, and willingness to provide telepharmacy services among pharmacy students: A multicenter cross-sectional study in Indonesia. *BMC Medical Education*, **23**, 800. <https://doi.org/10.1186/s12909-023-04790-4>
- Alkatheri, A. M., Albekairy, A. M., Khalidi, N., Phelps, S. J., Gourley, D. R., Al Jeraisy, M., & Qandil, A. M. (2019). Implementation of an ACPE-Accredited PharmD curriculum at a Saudi College of Pharmacy. *American Journal of Pharmaceutical Education*, **83**(9), 6237. <https://doi.org/10.5688/ajpe6237>
- Alkhateeb, F. M., Arkle, S., McDonough, S. L. K., & Latif, D. A. (2018). Review of national and international accreditation of pharmacy programs in the Gulf Cooperation Council Countries. *American Journal of Pharmaceutical Education*, **82**(10), 5980. <https://doi.org/>
- Alkhenizan, A., & Shaw, C. (2012). The attitude of health care professionals towards accreditation: A systematic review of the literature. *Journal of Family and Community Medicine*, **19**(2), 74–80. <https://doi.org/10.4103/2230-8229.98281>
- Almaghaslah, D., & Alsayari, A. (2021). Using a global systematic framework tool to identify pharmacy workforce development needs: A national case study on Saudi Arabia. *Risk Management and Healthcare Policy*, **14**, 3233–3245. <https://doi.org/10.2147/RMHP.S322577>
- Anderson, C., & Arakawa, N. (2021). Pharmacy education development. *Pharmacy (Basel)*, **9**(4), 168. <https://doi.org/10.3390/pharmacy9040168>
- Fathelrahman, A. I., Alrobaian, M., Altowayan, W. M., Maghrabi, I., & Asiri, Y. A. (2022). Pharmacy education in Saudi Arabia: Achievements and challenges during the last two decades with a focus on Taif University as a case study. *Saudi Pharmaceutical Journal*, **30**(6), 649–654. <https://doi.org/10.1016/j.jsps.2022.04.001>
- Hu, W., & Cao, Y. (2023). Advancement of pharmacy accreditation in the field of Chinese higher education. *Pharmacology & Pharmacy*, **14**(9), 376–387. <https://doi.org/10.4236/pp.2023.149024>
- Janke, K. K., Kelley, K. A., Kuba, S. E., Mason, H. L., Mueller, B. A., Plake, K. S., . . . Yee, G. C. (2013). Reenvisioning assessment for the Academy and the Accreditation Council for Pharmacy Education's standards revision process. *American Journal of Pharmaceutical Education*, **77**(7), 141. <https://doi.org/10.5688/ajpe777141>
- Jin, H. K., Park, S. H., Kang, J. E., Choi, K. S., Kim, H. A., Jeon, M. S., & Rhie, S. J. (2019). The influence of a patient counseling training session on pharmacy students' self-perceived communication skills, confidence levels, and attitudes about communication skills training. *BMC Medical Education*, **19**, 172. <https://doi.org/10.1186/s12909-019-1607-x>
- Kerr, A., O'Connor, H., Pawlikowska, T., Gallagher, P., & Strawbridge, J. (2020). A scoping review of health professional curricula: Implications for developing integration in pharmacy. *Research in Social and Administrative Pharmacy*, **16**(1), 1–16. <https://doi.org/10.1016/j.sapharm.2019.03.005>
- Keshishian, F., & Brenton, B. (2015). Pharmacy students' perceptions of their curriculum and profession: Implications for pharmacy education. *Pharmacy Education*, **11**, 194–200. <https://pharmacyeducation.fip.org/pharmacyeducation/article/view/304>

- Makrygianni, D., Koufaki, M. I., Patrinos, G. P., & Vasileiou, K. Z. (2023). Pharmacy students' attitudes and intentions of pursuing postgraduate studies and training in pharmacogenomics and personalised medicine. *Human Genomics*, **17**, 27. <https://doi.org/10.1186/s40246-023-00474-8>
- Manolakis, P. G., & Skelton, J. B. (2010). Pharmacists' contributions to primary care in the United States collaborating to address unmet patient care needs: The emerging role for pharmacists to address the shortage of primary care providers. *American Journal of Pharmaceutical Education*, **74**(10), S7. <https://doi.org/10.5688/aj7410s7>
- McManus, K., Metrejean, C., Schweitzer, K., Cooley, J., & Warholak, T. (2019). Quality improvement and safety in US pharmacy schools. *American Journal of Pharmaceutical Education*, **83**(9), 1898–1905. <https://doi.org/10.5688/ajpe7042>
- Naughton, C. A., & Friesner, D. L. (2012). Comparison of pharmacy students' perceived and actual knowledge using the Pharmacy Curricular Outcomes Assessment. *American Journal of Pharmaceutical Education*, **76**(4), 63. <https://doi.org/10.5688/ajpe76463>
- Nelson, N. R., Anderson, S. M., Zeeman, J. M., & Rhoney, D. H. (2021). A scoping review of the pharmacy curriculum outcomes assessment literature. *American Journal of Pharmaceutical Education*, **85**(8), 8505. <https://doi.org/10.5688/ajpe8505>
- Pearson, M. L., & Hubball, H. T. (2012). Curricular integration in pharmacy education. *American Journal of Pharmaceutical Education*, **76**(10), 204. <https://doi.org/10.5688/ajpe7610204>
- Przymuszala, P., Fabianowska, S., Zielinska-Tomczak, L., Cerbin-Koczorowska, M., & Marciniak, R. (2023). Factors influencing behavioral intentions of graduating pharmacy students regarding interprofessional collaboration - A theory-driven qualitative study. *BMC Health Service Research*, **23**, 1207. <https://doi.org/10.1186/s12913-023-10224-0>
- Taylor, A. (2017). Global health law: International law and public health policy. *International Encyclopedia of Public Health (Second Edition)*, 268–281. <https://doi.org/10.1016/B978-0-12-803678-5.00238-1>
- Watanabe, K., Sakai, T., & Ohtsu, F. (2023). Analysis of factors affecting pharmacists' ability to identify and solve problems. *Journal of Pharmaceutical Health Care and Sciences*, **9**, 31. <https://doi.org/10.1186/s40780-023-00300-2>
- Wilby, K. J., Alamri, M., & Monfared, S. (2019). Student and graduate perceptions regarding Canadian-based accreditation of a pharmacy program in Qatar. *American Journal of Pharmaceutical Education*, **83**(6), 6805. <https://doi.org/10.5688/ajpe6805>