

Delphi-Based Consensus on Aims, Contents, Learning Outcomes, Teaching and Assessment Methods for a History of Medicine and Pharmacy Course in the Arab Region

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Abstract

In many medical and pharmacy programs worldwide, history courses are included as essential didactic components. This research aimed to define consensus-based goals, content, intended learning outcomes, teaching strategies, and assessment methods for a history of medicine and pharmacy course tailored for medical and pharmacy students in the Arab World. A comprehensive literature review was conducted across PubMed, ScienceDirect, SpringerLink, Scopus, and Google Scholar to extract information about course objectives, content, and intended learning outcomes. In addition, semi-structured interviews were carried out with 5 academic faculty members, 3 pharmacists, and 3 physicians. Using a Delphi approach, a panel consisting of 10 educators/academicians, 4 physicians, and 4 pharmacists was consulted to reach agreement on course aims, topics, outcomes, teaching methods, and evaluation techniques. Panelists showed high agreement ($\geq 88.9\%$) on 10 key items emphasizing the importance of history education for medical and pharmacy students. Across two Delphi rounds, 4 consensus-based course objectives and 13 intended learning outcomes were established. The panel recommended allocating 16 contact hours (equivalent to 1 credit hour) for course delivery. Bloom's taxonomy was applied to cover both basic and advanced cognitive skills. Suggested instructional methods included in-person lectures, curated readings, documentary videos, case studies, group discussions, and debates. Assessment could be carried out using multiple-choice exams, written reflections, portfolios, group assignments, and participation in interactive discussions and debates. A structured, consensus-based history of medicine and pharmacy course was formulated for medical and pharmacy students in the Arab World. Well-defined objectives, content, learning outcomes, teaching methods, and evaluation tools are expected to meet accreditation standards and support student learning. Further research is required to evaluate the effect of such courses on student performance.

Keywords: Education, History of medicine, Pharmacy, Delphi method, Consensus

Introduction

History courses are recognized as fundamental components in medical and pharmacy curricula globally [1]. In the United States, the "Standards 2016" report by the Accreditation Council for Pharmacy Education required a history of pharmacy as a core element [1, 2]. Recommended topics included the profession's

evolution, significant milestones, discoveries, achievements, and influential contributors [2]. Historically, the American Institute of the History of Pharmacy provided guidance to help institutions meet these curricular standards [3, 4].

Research has shown that history education in medicine and pharmacy is often delivered either as a standalone required or elective course, or through a limited number of hours embedded within other programs [1, 3, 5]. Older data indicated that, of 70 US pharmacy schools, roughly half offered a history course, and 28 schools had required courses devoted entirely to history [1]. Over time, the increasing focus on therapeutics and clinical sciences reduced the presence of history-focused courses in many curricula worldwide [6, 7].

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Baker *et al.* examined how US pharmacy schools complied with history teaching standards, whether expanding history education was necessary, what pedagogical support was needed, and the availability of elective history courses [1]. Their findings revealed that 86% of schools fulfilled Accreditation Council requirements, with most (72%) dedicating 1–5 hours to meet standards. However, 68% lacked standard textbooks or supporting literature, and 91% indicated a need for pedagogical resources such as syllabi, assignments, and evaluation tools.

In Palestine, the history of medicine and pharmacy is offered as an elective, and teaching varies by instructor. Given the priority of accreditation in medical and pharmacy programs [8], there is a need to standardize course objectives, content, and intended outcomes. Formal consensus-building techniques, particularly the

Delphi method, are widely employed in healthcare education for developing agreed-upon curricula. This study aimed to establish consensus-driven course objectives, content, learning outcomes, teaching approaches, and assessment methods for a history of medicine and pharmacy course targeting medical and pharmacy students in the Arab World.

Materials and Methods

Study design

This investigation applied the Delphi method, a structured approach for building formal consensus. The reporting of this study follows the Conducting and REporting of DELphi Studies (CREDES) guidelines [9]. The overall workflow of the study is depicted in **Figure 1**.

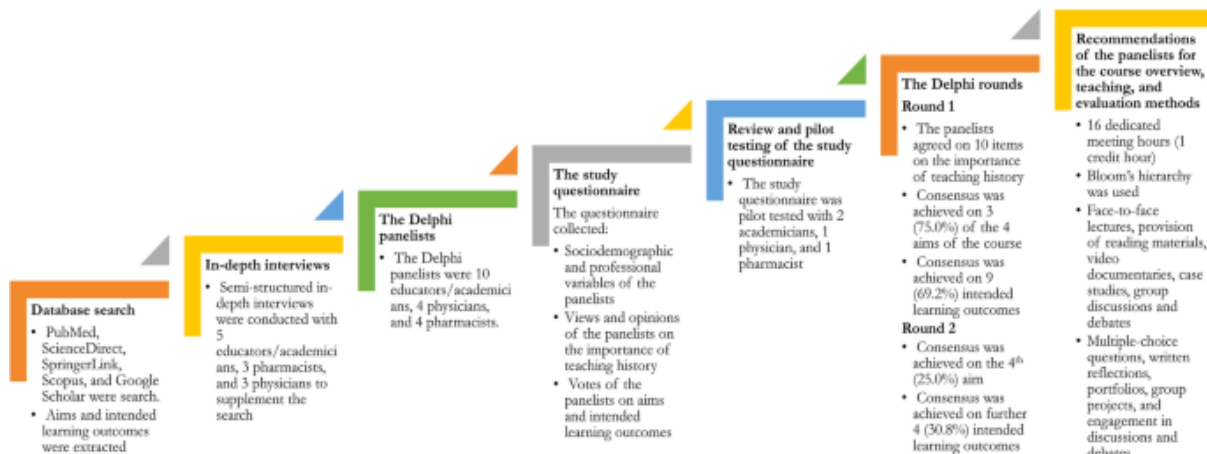


Figure 1. Illustrative flowchart showing the stages of the study

Planning and execution

Literature search

A systematic search was conducted in PubMed, ScienceDirect, SpringerLink, Scopus, and Google Scholar to identify course objectives and intended learning outcomes for the history of medicine and pharmacy. The search strategy combined text words [TW] and MeSH terms related to “Education”, “Curriculum”, “Teaching”, “Learning” AND “History” AND “Medicine” OR “Pharmacy”. Articles were screened, and relevant objectives and outcomes were extracted. This approach followed methods described in previous studies [10, 11].

Qualitative interviews

To supplement the literature review, semi-structured interviews were held with 5 educators/academicians, 3 pharmacists, and 3 physicians. The goal was to gather insights on potential course objectives and outcomes not captured in published sources [12–16]. Interviews were transcribed word-for-word and analyzed using thematic analysis [12].

Selection of the panelists for the Delphi technique

In the present investigation, participants for the successive Delphi rounds were identified through purposive sampling [12–16]. Individuals within the professional network were approached to locate, invite, and enroll panelists, including educators/academicians ($n = 10$), physicians ($n = 4$), and pharmacists ($n = 4$). Those educators/academicians, physicians, and pharmacists

who had taken part in the qualitative in-depth interviews were likewise incorporated into the Delphi panel. The final panel size was guided by evidence from earlier research in the field. It should be noted that no agreed-upon standard exists regarding the optimal number of panelists in Delphi studies; prior work has reported panel sizes ranging from 10 to 1000. The selection of panel members has been described as one of the most critical stages of the Delphi process [12-17]. Familiarity with the subject matter under investigation is commonly regarded as a key requirement for inclusion in a Delphi panel. Accordingly, educators/academicians were chosen based on their expertise and hands-on experience in teaching the history of medicine and pharmacy. Physicians and pharmacists were recruited as practitioners with an interest in the history of medicine and pharmacy and with practical professional experience in their respective disciplines. Efforts were made to ensure diversity among panelists with respect to gender, age categories, academic qualifications, employment sector, and years of professional experience. Prior to participation, the study objectives and methodology were explained to all panelists, after which written informed consent was obtained.

The study questionnaire

Learning objectives and intended learning outcomes identified through the literature review and qualitative interviews were compiled into a structured questionnaire [10, 12, 17]. The instrument consisted of three sections. The first section gathered sociodemographic and professional information, including gender, age, academic qualifications, profession, employer type, and duration of practical experience. The second section elicited panelists' perspectives on 10 statements addressing the significance of teaching the history of medicine and pharmacy to medical and pharmacy students. Responses for each statement were recorded using a three-point option (disagree/neutral/agree). The third section captured panelists' ratings for 4 items related to the overall course aims and 13 items concerning the intended learning outcomes. These ratings were provided using a 1–9 Likert scale.

Piloting and review of the questionnaire

Before implementation, the questionnaire underwent pilot testing with 2 academicians, 1 physician, and 1 pharmacist to assess clarity and comprehensibility. Among these pilot participants, 1 academician and 1

pharmacist were subsequently included in the Delphi panel. Revisions were made to item wording based on feedback obtained during the pilot phase to enhance clarity.

The first Delphi round

During the initial Delphi round, the questionnaire was circulated to all panelists. Participants completed the first section by providing their sociodemographic and professional details, indicated their agreement levels for the 10 statements in the second section, and cast their votes on each item presented in the third section.

Analysis of the votes and definition of consensus

Criteria for defining consensus were derived from earlier studies in this area [12-17]. Consensus was considered achieved under the following conditions: (1) when the panel median score fell between 7–9 and the interquartile range (IQR) was < 2 , the corresponding aim or intended learning outcome was accepted and retained in the final list; (2) when the median score was between 1–3 and the IQR was ≤ 2 , consensus was reached to exclude the aim or intended learning outcome from the final list; and (3) when the median score ranged from 4–6 and/or the IQR exceeded 2, the item was categorized as equivocal. It was determined in advance that all equivocal items would be reassessed in subsequent Delphi rounds.

The second Delphi round

All items classified as equivocal were incorporated into a modified questionnaire for the second Delphi round. For each item, panelists were reminded of their individual rating from the first round, along with the group median and IQR. Participants were invited either to revise their ratings after reviewing the collective responses or to reaffirm their original judgments. Data from the second round were analyzed using the same consensus criteria applied in the first round.

Proposed course overview, teaching, and evaluation methods

Drawing on the panelists' voting outcomes, the principal investigator developed a proposed framework for the course overview, instructional strategies, and assessment methods. This proposal was circulated to panelists for critique and feedback [17]. Panel members were requested to provide detailed comments and were encouraged to contribute additional suggestions, viewpoints, and opinions. All feedback was subjected to

qualitative analysis. Synthesized summaries of panelists' comments, including illustrative quotations, were then shared with all participants for final review. Panelists were asked to indicate agreement or disagreement with the summarized feedback.

Ethics approval and consent to participate

The study was carried out in accordance with the principles of the Declaration of Helsinki and the ethical guidelines observed at An-Najah National University. It formed part of a broader initiative aimed at enhancing education in medicine and other health professions and received approval from the Institutional Review Board of An-Najah National University. Written informed consent

was obtained from all panelists prior to their participation.

Results and Discussion

Panelist characteristics

Eighteen individuals participated in the Delphi process. Of these, 8 (44.4%) were female, 11 (61.1%) were aged 45 or older, 10 (55.6%) were educators/academicians, 10 (55.6%) held a PhD, 10 (55.6%) were employed at academic institutions, and 12 (66.7%) had ten or more years of professional experience. All panelists were from the Arab region. Detailed demographic and professional characteristics are presented in **Table 1**.

Table 1. Sociodemographic and professional characteristics of panelists (n = 18)

Variable	%	n
Gender		
Male	55.6	10
Female	44.4	8
Age group		
< 45	38.9	7
≥ 45	61.1	11
Country of origin		
Palestine	50.0	9
Jordan	11.1	2
Egypt	11.1	2
Morocco	5.6	1
Syria	11.1	2
Tunisia	5.6	1
United Arab Emirates	5.6	1
Profession		
Educator/academician	55.6	10
Physician	22.2	4
Pharmacist	22.2	4
Academic degree		
BSc/Pharm.D	11.1	2
MSc	11.1	2
MD	22.2	4
PhD	55.6	10
Employer		
Academic institution	55.6	10
Hospital/clinic	22.2	4
Pharmacy	22.2	4
Length of practical experience (years)		

< 10	33.3	6
≥ 10	66.7	12

BSc Bachelor of Science, CAM Complementary and Alternative Medicine, MD Doctor of Medicine, MSc Master of Science, Pharm.D Doctor of Pharmacy, PhD Doctor of Philosophy

Panelists' perspectives on teaching the history of medicine and pharmacy

Panelists evaluated the relevance of incorporating the history of medicine and pharmacy courses into medical and pharmacy curricula. Overall, agreement across all 10 items was high ($\geq 88.9\%$), and no panelist expressed disagreement. Comprehensive results are presented in

Table 2.

Table 2. Panelists' perspectives on the significance of teaching history of medicine and pharmacy

#	Importance Statement	Disagree (%)	Disagree (n)	Neutral (%)	Neutral (n)	Agree (%)	Agree (n)
1	Understanding history offers valuable perspectives on what to explore and how to approach investigations.	0.0	0	5.6	1	94.4	17
2	Awareness of history serves as an effective safeguard against mistakes, arrogance, and discouragement.	0.0	0	5.6	1	94.4	17
3	Instruction in the history of medicine and pharmacy deepens knowledge, satisfies curiosity, expands horizons, and improves wisdom and discernment.	0.0	0	0.0	0	100.0	18
4	Courses on the history of medicine and pharmacy allow emphasis on forgotten or underappreciated discoveries and key milestones.	0.0	0	0.0	0	100.0	18
5	Courses in the history of medicine and pharmacy provide students with the inspiration of lofty ideals they should aspire to.	0.0	0	5.6	1	94.4	17
6	Courses in the history of medicine and pharmacy encourage students to value and uphold the finest traditions.	0.0	0	5.6	1	94.4	17
7	Courses in the history of medicine and pharmacy assist students in strengthening their connection to their chosen future profession.	0.0	0	5.6	1	94.4	17
8	Knowledge of history helps fulfill the responsibility of honoring the memories, virtues, and achievements of those who have uniquely benefited humanity.	0.0	0	0.0	0	100.0	18
9	Courses in the history of medicine and pharmacy guide students to respect and admire what is truly worthwhile.	0.0	0	11.1	2	88.9	16
10	Understanding history allows students to take pride in those remembered for their enduring memories, virtues, and accomplishments.	0.0	0	5.6	1	94.4	17

Consensus-based general aims

In the first Delphi round, 3 of the 4 proposed course aims (75.0%) achieved consensus. The fourth aim reached

consensus during the second round (25.0%). Voting details for each aim across both rounds are displayed in **Table 3.**

Table 3. Consensus-based general aims of the course

#	Aim Statement	Round 2 Median	Round 2 Q1	Round 2 Q3	Round 2 IQR	Round 1 Median	Round 1 Q3	Round 1 Q1	Round 1 IQR
1	Equipping students with comprehensive knowledge and deep understanding of the history of medicine and pharmacy.	na	na	na	na	8.0	8.8	7.0	1.8
2	Helping students identify and appreciate the contributions made by various individuals and civilizations in medicine and pharmacy.	na	na	na	na	8.0	8.8	7.3	1.5
3	Assisting students in comprehending the underlying principles, core concepts, beliefs, and theories related to disease and treatment across different civilizations.	7.0	9.0	7.0	2.0	5.0	7.0	4.0	3.0
4	Giving students insight into the most significant milestones and breakthroughs in the history of medicine and pharmacy.	na	na	na	na	7.0	8.0	7.0	1.0

na not applicable, Q1 1st quartile, Q3 3rd quartile, IQR interquartile range

outcomes (30.8%) achieved consensus in the second round. Detailed voting results are shown in **Table 4**.

Consensus-based intended learning outcomes

Among the 13 proposed learning outcomes, 9 (69.2%) reached consensus in the first round. The remaining 4

Table 4. Consensus-based intended learning outcomes of the course

#	Paraphrased Outcome	Round 2 Median	Q3	Q1	IQR	Round 1 Median	Q3	Q1	IQR
1	Outline how concepts, identification, and management of diseases developed throughout successive civilizations.	7.0	8.0	7.0	1.0	5.5	7.0	5.0	2.0
2	Describe how fossil evidence has contributed to interpretations of diseases and abnormalities in early humans.	8.0	8.8	7.0	1.8	6.0	7.0	3.5	3.5
3	Explain the various instruments and methods employed by healers in ancient societies for diagnosing and treating illnesses.	na	na	na	na	8.0	8.8	7.0	1.8
4	Assess the significance of early medical and pharmaceutical discoveries.	na	na	na	na	7.0	8.0	7.0	1.0
5	Examine the role of shamanistic healers in prehistoric societies and their relevance to modern healthcare practices.	8.0	8.0	7.0	1.0	6.0	7.0	5.0	2.0
6	Identify major contributions of Ancient Chinese, Indian, Greek, Roman, and Muslim civilizations to medicine and pharmacy and their influence on the standardization of contemporary Western practice.	na	na	na	na	7.5	8.0	7.0	1.0
7	Analyze how certain civilizations expanded upon the medical and pharmaceutical knowledge of earlier societies.	na	na	na	na	7.0	8.8	7.0	1.8
8	Identify key historical figures who played a role in advancing medicine and pharmacy.	na	na	na	na	8.0	8.0	7.0	1.0
9	Explain the factors that led to the separation of pharmacy as a distinct profession from medicine.	7.0	7.0	7.0	0.0	7.0	8.0	5.0	3.0
10	Describe the defining characteristics of early pharmaceutical practice within Muslim civilization.	na	na	na	na	7.0	8.0	7.0	1.0

11	Discuss the contributions and accomplishments of Muslim scholars in medicine and pharmacy.	na	na	na	na	7.0	8.0	6.3	1.8
12	Describe how the pharmaceutical industry has evolved over time.	na	na	na	na	7.0	8.0	7.0	1.0
13	Discuss the historical background of selected diseases and the medications currently used to treat them.	na	na	na	na	7.5	8.0	7.0	1.0

Course outline, teaching, and assessment strategies

Panelists' recommendations on the course structure, instructional approaches, and assessment methods were examined qualitatively. Suggestions included allocating appropriate meeting hours, engaging students across multiple cognitive levels based on Bloom's taxonomy, and applying a variety of teaching and evaluation techniques to optimize learning.

Number of contact hours

The panelists recommended that allocating 16 hours (equivalent to 1 credit) would adequately cover the course content.

"From my perspective, the 16 hours already set aside are enough to teach the full course." — Educator/academician with 11 years of teaching experience.

All panel members agreed that this duration would suffice for covering the course material in detail.

Integration of Bloom's taxonomy

Panelists highlighted the importance of structuring the course to engage students across different cognitive levels, following Bloom's taxonomy. For foundational skills, verbs such as *describe* (knowledge) and *explain* (understanding) were recommended, whereas higher-level skills could be addressed using verbs like *reflect* (evaluation). **Figure 2** provides a visual representation of how these verbs can be applied to target both lower- and higher-order cognitive skills.

"The course should encourage not just knowledge acquisition but also curiosity and reflective thinking among students." — Physician with 9 years of clinical experience.

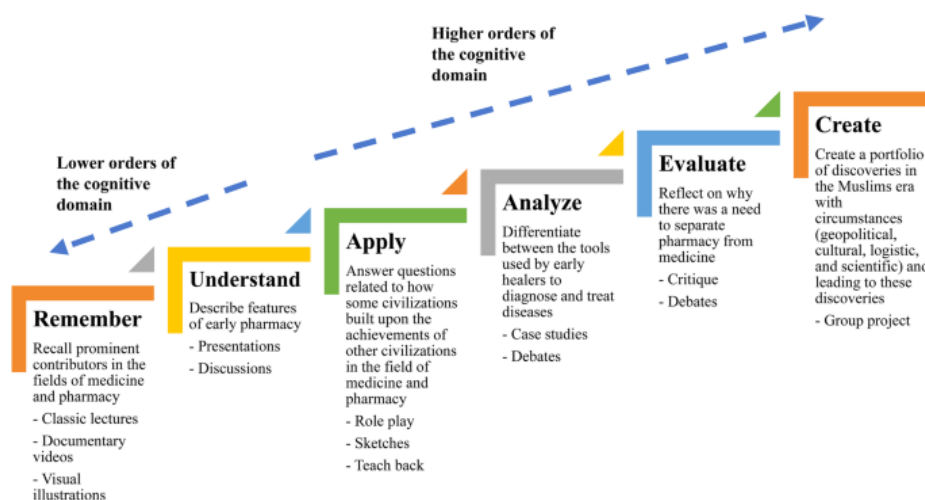


Figure 2. Representation of bloom's taxonomy applied to teaching and assessing students' lower- and higher-order cognitive skills.

Instructional strategies

The panel suggested that the history content could be delivered mainly through in-person lectures using presentation tools such as PowerPoint or Prezi. Students could also be given preparatory reading materials to enable active participation in discussions. Incorporating video documentaries and case studies on significant

discoveries was suggested to promote interactive learning through debates and discussions.

"Many students grasp concepts better visually; therefore, documentaries can be very effective." — Educator/academician with 7 years of teaching experience.

Several panelists recommended blending lectures, group discussions, and presentations to achieve the course objectives effectively.

"Lectures can help students build a practical understanding of history, supporting achievement of some learning outcomes." — Pharmacist with 10 years of professional experience.

Additionally, students could engage in reflective writing and group projects. These activities, combined with discussions and debates, would allow learners to apply the knowledge gained in lectures, fostering higher-order thinking skills (**Figure 2**).

"Focusing on higher-order cognitive skills is crucial, and reflections are an excellent method to accomplish this." — Educator/academician with 12 years of teaching experience.

Assessment methods

Panelists noted that much of the course targets lower-order cognitive skills (knowledge and understanding). For this, multiple-choice questions (MCQs) were suggested as an appropriate evaluation tool. To assess higher-order thinking, portfolios encompassing presentations, case study analyses, written reflections, and group projects could be employed (**Figure 2**).

The present study aimed to create a set of consensus-derived objectives and intended learning outcomes for a course on the history of medicine and pharmacy, employing the Delphi method as a structured consensus tool. Panelists evaluated ten statements concerning the relevance of teaching history to medical and pharmacy students. Through this process, agreement was reached on four overarching course objectives and thirteen specific learning outcomes. In addition, the study compiled recommendations on course structure, allocation of contact hours, instructional approaches, and evaluation techniques. To our knowledge, this is the first study in the Arab World to systematically define consensus-based learning objectives and outcomes for a history of medicine and pharmacy course using a formalized method. The results provide actionable guidance for academic leaders and educators seeking to develop similar courses.

There has been growing attention in recent years toward establishing consensus-driven curricula [8, 18]. Prior literature offered minimal guidance on the design of history courses for medical and pharmacy programs, particularly regarding objectives and intended learning outcomes [1, 8, 18]. This investigation addresses that gap

by presenting a structured framework for course objectives and learning outcomes, as well as practical guidance for managing instructional time, engaging students in active learning, and assessing their performance across cognitive levels.

Historically, history courses have often been perceived as less engaging, especially in highly competitive educational environments, which can lead students and faculty to prioritize core scientific subjects [1, 6, 7]. Medical and pharmacy programs frequently involve dense curricula with substantial information that students must master [1, 3]. Students also face demanding assessment schedules, leaving little room for reflection or enrichment. Nevertheless, understanding the key events, achievements, and figures that shaped medicine and pharmacy remains essential, as historical knowledge offers lessons from both failures and successes in these fields [1, 3, 5-7, 19-25]. Integrating Bloom's taxonomy and fostering intellectual curiosity can help mitigate the monotony sometimes associated with history courses. Consistent with this reasoning, the panelists overwhelmingly endorsed the importance of including history in medical and pharmacy education. Notably, these viewpoints align with the appeal made by Dr. Eugene Cordell during the 105th anniversary of the Medical and Chirurgical Faculty of Maryland, emphasizing the enduring value of teaching history in medicine [19].

The learning outcomes for this course were structured according to Bloom's cognitive domain, as revised by Krathwohl and Anderson [26], with particular emphasis on fostering knowledge, curiosity, broad perspectives, and the development of wisdom and judgment [1, 3, 7, 19, 27, 28]. Because students were expected to engage at multiple cognitive levels, teaching strategies were carefully designed to support this objective. While Skinner's behaviorist theories initially emphasized learning as a response to external stimuli [29], subsequent cognitive theories focused on internal mental processes, including memory, perception, reasoning, problem-solving, and concept formation [30]. These cognitive frameworks highlight that learning occurs through the integration of new information with existing knowledge structures [26, 31]. In this study, using Bloom's action verbs provided a structured way to ensure that both lower-order and higher-order cognitive skills were targeted effectively.

Cognitive domain and learner types

Bloom introduced the concept of the cognitive domain and developed theories associated with this domain, which continue to influence modern approaches to teaching and learning [26]. Building on Bloom's work, Benner illustrated that learners progress through a developmental continuum during professional education, moving from novice to expert stages [20, 32]. Honey and Mumford categorized learners into four types: activists, reflectors, theorists, and pragmatists [27, 33]. It has been suggested that each learner type can operate at a distinct level within Bloom's taxonomy, although the pathway each takes to reach that level may differ [34, 35]. The course designed in this study accounted for these learner variations and aimed to engage all categories effectively.

Instructional strategies

Panelists recommended that history could be primarily taught through in-person lectures, utilizing presentation tools such as PowerPoint or Prezi. Students could also be provided with preparatory reading materials to support active participation in group discussions. At times, video documentaries and case studies highlighting key discoveries could be integrated into classroom sessions, encouraging students to participate in discussions and debates [36]. These activities were intended to: 1) actively involve students in the learning process, 2) target higher cognitive functions according to Bloom's taxonomy, 3) develop skills in debating historical medical and pharmacy practices, and 4) foster appreciation of achievements, virtues, and the contributions of prominent figures.

The teaching approach combines lectures, presentations, and group discussions. This blended method offers several pedagogical advantages [34, 35]. Lectures and presentations allow students to acquire foundational knowledge, primarily addressing the lower levels of Bloom's cognitive domain [35]. Selected documentaries provide opportunities for students to engage in discussions and debates, while reflective writing assignments encourage deeper consideration of these issues. Activities such as debates, discussions, reflections, and group projects are designed to engage higher-order cognitive skills [37]. Through these activities, students apply knowledge gained from lectures and presentations to more complex cognitive tasks.

Assessment strategies

Given that a substantial portion of the course focuses on lower-order thinking skills (knowledge and

understanding), multiple-choice questions (MCQs) are proposed for evaluating these dimensions [28]. While MCQs are limited in assessing higher-order cognitive skills, they enable coverage of a broad range of topics and reduce grading bias. MCQs are also commonly used in licensure, board, and equivalency examinations [38, 39]. To assess higher-order thinking, student portfolios including presentations, case analyses, written reflections, and group projects would be used.

Strengths and limitations

Several strengths and limitations should be considered when interpreting the results of this study. The main strengths include: 1) this study is the first to establish consensus-based objectives and intended learning outcomes for a history of medicine and pharmacy course targeting medical and pharmacy students; 2) the use of the Delphi technique provided a rigorous formal consensus method, widely recognized for developing consensus in areas lacking agreement; and 3) the panelists were diverse in terms of gender, age, country of origin, profession, employer type, and years of experience. This diversity adds breadth and depth to the findings. Since the panel included both educators/academicians and practicing professionals (physicians and pharmacists), the collected perspectives likely reflect both teaching and professional practice viewpoints.

Despite the contributions of this study, several limitations should be acknowledged. First, the study relied solely on the perspectives of panelists from the Arab World. Panelists from other global regions were not included, which may restrict the course's applicability beyond this context. Second, the course content was derived from the opinions of participating panelists. As with all consensus-based studies, the results are inherently limited because they represent the views of the participants rather than the broader population of educators, academicians, or healthcare professionals (physicians and pharmacists). Third, the panel size in this study was relatively small. Nevertheless, there is no established consensus on the optimal Delphi panel size; previous studies have utilized panels ranging from 10 to 1000 participants. The panel size in this study falls within that documented range. Fourth, the perspectives of students were not incorporated. This limitation will be addressed in a future study designed to gather and compare student opinions with those of educators, academicians, and healthcare professionals.

Implications for future practice and research

Several challenges exist in teaching history courses to medical and pharmacy students. These include limited instructional hours, scarcity of specialized lecturers in the history of medicine and pharmacy, low interest in history courses among students, inconsistent participation across academic levels (e.g., Sophomores, Juniors, Seniors, or elective attendees), absence of performance assessments, lack of historical clubs, variability in course content, and the scarcity of well-structured textbooks or course materials [3, 5-7, 19].

Teaching the history of medicine and pharmacy remains a valuable educational pursuit for future physicians and pharmacists. Instruction grounded in the cognitive domain of Bloom's taxonomy has demonstrated rigor and aligns with higher education quality standards. Educators should employ diverse pedagogical approaches to ensure learners attain higher cognitive levels. Globally, accreditation of medical and pharmacy programs has become a priority for schools of medicine and pharmacy [8]. With the growing focus on accreditation, there have been multiple calls to standardize courses to align with global norms and professional standards [18]. Accordingly, consensus-based course development may increase the likelihood of meeting nationally and internationally recognized standards [8, 18]. The methodology applied in this study may guide educators and academicians in the Arab World to design consensus-based courses that satisfy these standards.

Conclusion

A consensus-based course on the history of medicine and pharmacy was developed for medical and pharmacy students in the Arab World. Courses with well-structured aims, content, intended learning outcomes, teaching strategies, and evaluation methods are more likely to fulfill accreditation requirements and enhance student performance. Further research is warranted to determine whether such consensus-based courses lead to measurable improvements in student outcomes.

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References

1. Baker DM, Colaizzi JL, Leite K, Buerki RA, Higby GJ, McCarthy RL, et al. Teaching history of pharmacy in U.S. pharmacy schools. *Am J Pharm Educ*. 2019;83(1):6500. <https://doi.org/10.5688/ajpe6500>.
2. Education ACfP: Accreditation standards and key elements for the professional program in pharmacy leading to the doctor of pharmacy degree. Chicago: Accreditation Council for Pharmacy Education; 2015.
3. Ridgway WC. Teaching history of pharmacy. *J Pharm Teach*. 2001;8(3):59–70. https://doi.org/10.1300/J060v08n03_06.
4. Urdang G. The American Institute of the History of pharmacy. *Bull Hist Med*. 1941;10:690–700.
5. Cowen DL. The history of the science of pharmacy. *Pharm Hist*. 1962;7:17–20.
6. Colaizzi JL. The future of the history of pharmacy in the professional curriculum. *J Pharm Teach*. 2001;8(3):76–80. https://doi.org/10.1300/J060v08n03_08.
7. Urdang G. History of pharmacy as an academic discipline. *J Hist Med Allied Sci*. 1948;3(1):5–10. <https://doi.org/10.1093/jhmas/iii.1.5>.
8. Yoo HH, Kim MK, Yoon YS, Lee KM, Lee JH, Hong S-J, Huh JS, Park WK. Changes in the accreditation standards of medical schools by the Korean Institute of Medical Education and Evaluation from 2000 to 2019. *J Educ Eval Health Prof*. 2020;17:2–0. <https://doi.org/10.3352/jeehp.2020.17.2>.
9. Junger S, Payne SA, Brine J, Radbruch L, Brearley SG. Guidance on Conducting and REporting DElphi Studies (CREDES) in palliative care: Recommendations based on a methodological systematic review. *Palliat Med*. 2017;31(8):684–706.
10. Shawahna R. Quality indicators of Pharmaceutical Care for Integrative Healthcare: a scoping review of indicators developed using the Delphi technique. *Evid Based Complement Alternat Med*. 2020;2020:9131850–20. <https://doi.org/10.1155/2020/9131850>.
11. Shawahna R, Batta A, Asa'ad M, Jomaah M, Abdelhaq I. Exercise as a complementary medicine

- intervention in type 2 diabetes mellitus: a systematic review with narrative and qualitative synthesis of evidence. *Diabetes Metab Syndr*. 2021;15(1):273–86. <https://doi.org/10.1016/j.dsx.2021.01.008>.
12. Shawahna R. Quality indicators of Pharmaceutical Care in Palestinian Integrative Healthcare Facilities: findings of a qualitative study among stakeholders. *Evid Based Complement Alternat Med*. 2020;2020:4520769–13. <https://doi.org/10.1155/2020/4520769>.
 13. Shawahna R. Development of key performance indicators to capture in measuring the impact of pharmacists in caring for patients with epilepsy in primary healthcare: a Delphi consensual study. *Epilepsy Behav*. 2019;98(Pt A):129–38. <https://doi.org/10.1016/j.yebeh.2019.07.034>.
 14. Shawahna R, Al-Atrash M. What do primary healthcare providers and complementary and alternative medicine practitioners in Palestine need to know about exercise for Cancer patients and survivors: a consensual study using the Delphi technique. *Evid Based Complement Alternat Med*. 2019;2019:7695818–4. <https://doi.org/10.1155/2019/7695818>.
 15. Shawahna R, Qiblawi S, Ghanayem H. Which benefits and harms of using fenugreek as a Galactagogue need to be discussed during clinical consultations? A Delphi study among breastfeeding women, gynecologists, pediatricians, family physicians, lactation consultants, and pharmacists. *Evid Based Complement Alternat Med*. 2018;2018:2418673–13. <https://doi.org/10.1155/2018/2418673>.
 16. Shawahna R. Which information on women's issues in epilepsy does a community pharmacist need to know? A Delphi consensus study. *Epilepsy Behav*. 2017;77:79–89. <https://doi.org/10.1016/j.yebeh.2017.09.026>.
 17. Shawahna R. Development of key performance indicators for capturing impact of Pharmaceutical Care in Palestinian Integrative Healthcare Facilities: a Delphi consensus study. *Evid Based Complement Alternat Med*. 2020;2020:7527543–14. <https://doi.org/10.1155/2020/7527543>.
 18. Blouin D, Tekian A. Accreditation of medical education programs: moving from student outcomes to continuous quality improvement measures. *Acad Med*. 2018;93(3):377–83. <https://doi.org/10.1097/acm.0000000000001835>.
 19. Cordell EF. The importance of the study of the history of medicine. *Med Library Hist J*. 1904;2(4):268–82.
 20. Murray M, Sundin D, Cope V. Benner's model and Duchscher's theory: providing the framework for understanding new graduate nurses' transition to practice. *Nurse Educ Pract*. 2019;34:199–203. <https://doi.org/10.1016/j.nepr.2018.12.003>.
 21. Esparza J. Lessons from history: what can we learn from 300 years of pandemic flu that could inform the response to COVID-19? *Am J Public Health*. 2020;110(8):1160–1. <https://doi.org/10.2105/ajph.2020.305761>.
 22. Waller J. Lessons from the history of medicine. *J Investig Surg*. 2008;21(2):53–6. <https://doi.org/10.1080/08941930801986459>.
 23. Tekiner H. Pharmacy history courses may - and should - offer more than professionalism. *Am J Pharm Educ*. 2018;82(4):7012. <https://doi.org/10.5688/ajpe7012>.
 24. Watkins ES. From history of pharmacy to pharmaceutical history. *Pharm Hist*. 2009;51(1):3–13.
 25. Thornton JL. The importance of the study of the history of medicine. *Health Libr Rev*. 1987;4(3):139–40. <https://doi.org/10.1046/j.1365-2532.1987.430139.x>.
 26. Adesoji FA. Bloom taxonomy of educational objectives and the modification of cognitive levels. *Adv Soc Sci Res J*. 2018;5(5). <https://doi.org/10.14738/assrj.55.4233>.
 27. Bhalli MA, Khan IA, Sattar A. Learning style of medical students and its correlation with preferred teaching methodologies and academic achievement. *J Ayub Med Coll Abbottabad*. 2016;27:837–42.
 28. Gallagher CT. Building on Bloom: a paradigm for teaching pharmacy law and ethics from the UK. *Curr Pharm Teach Learn*. 2011;3:71–6. <https://doi.org/10.1016/j.cptl.2010.10.002>.
 29. Reimann A. Behaviorist learning theory. The TESOL Encyclopedia of English Language Teaching. 2018:1–6.
 30. Reddy M, Panacharoensawad B. Students problem-solving difficulties and implications in physics: an empirical study on influencing factors. *J Educ Pract*. 2017;8:59–62.

31. Bloom BS. Taxonomy of educational objectives. Vol. 1. In: Cognitive domain, vol. 20. New York: McKay; 1956.
32. Benner P. From novice to expert: excellence and power in clinical nursing practice. Menlo Park: Addison-Wesley; 1984.
33. Honey P, Mumford A. The manual of learning styles. Melbourne: Peter Honey Maidenhead; 1992.
34. Pashler H, McDaniel M, Rohrer D, Bjork R. Learning styles: concepts and evidence. *Psychol Sci Public Interest*. 2008;9(3):105–19. <https://doi.org/10.1111/j.1539-6053.2009.01038.x>.
35. Buşan A-M. Learning styles of medical students - implications in education. *Curr Health Sci J*. 2014;40:104–10. <https://doi.org/10.12865/CHSJ.40.02.04>.
36. Shawahna R. Facilitating ethical, legal, and professional deliberations to resolve dilemmas in daily healthcare practice: a case of driver with breakthrough seizures. *Epilepsy Behav*. 2020;102:106703. <https://doi.org/10.1016/j.yebeh.2019.106703>.
37. Saido GM, Siraj S, Nordin ABB, Al_Amedy OS. Higher order thinking skills among secondary school students in science learning. *Malays Online J Educ Sci*. 2018;3:13–20.
38. Shawahna R, Khaskiyyi M, Abdo H, Msarwe Y, Odeh R, Salame S. Palestinian pharmacists' knowledge of issues related to using psychotropic medications in older people: a cross-sectional study. *J Educ Eval Health Prof*. 2017;14:8–8. <https://doi.org/10.3352/jeehp.2017.14.8>.
39. Shawahna R, Al-Rjoub M, Al-Horoub MM, Al-Hroub W, Al-Rjoub B, Al-Nabi BA. Risk of error estimated from Palestine pharmacists' knowledge and certainty on the adverse effects and contraindications of active pharmaceutical ingredients and excipients. *J Educ Eval Health Prof*. 2016;13:1–1. <https://doi.org/10.3352/jeehp.2016.13.1>.