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GENERATIVE AI AND SELF-MEDICATION: RISKS, RELIABILITY, AND PATIENT SAFETY IN THE ERA OF AI-BASED HEALTHCARE

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ABSTRACT

Health-professions students are increasingly using artificial intelligence (AI) tools, especially large language model (LLM)-based chatbots like ChatGPT, for academic tasks as well as informal drug information retrieval, symptom checking, and self-medication decision-making.[2,9,3,7] Due to their dual roles as future gatekeepers of safe pharmaceutical use, trainees in sciences connected to medicine, and consumers of health information, pharmacy students hold a special place in this conversation.[2,3,20,33,56] In order to describe what is known about pharmacy (and allied health) students' knowledge of AI, their attitudes toward its use in clinical and self-care contexts, and their actual practices—including the use of AI for drug information, dosing guidance, and self-diagnosis-adjacent tasks—this review synthesizes nine cross-sectional Knowledge, Attitude, and Practice (KAP) studies conducted between 2022 and 2026 across Zambia.[3] Saudi Arabia.[2,6] India.[1,4,8] Syria.[9] Malaysia.[5] and other settings. AI awareness is almost universal (82–100%) in all contexts.[2,3,5,6,8,9] but conceptual understanding of AI subtypes, medical uses, and limitations is generally lower (30–60%).[2,3,5,6,8,9] Concerns concerning data privacy, false information, over-reliance, and professional displacement temper the generally positive attitudes.[1,2,6,7,8] Practice is still limited: formal curricular training is uncommon (7–46%).[2,3,6,7,9] and the majority of self-reported AI use focuses on academic activities (summarizing, presentations, exam preparation) rather than verified clinical decision-support.[3,4,5,7] There is a dearth of direct data on AI-assisted self-diagnosis and self-medication, particularly among pharmacy students. In order to outline the emerging risk landscape and suggest curricular and regulatory responses, this review draws conclusions from related findings, such as the use of ChatGPT for "getting drug information".[2] perceived AI usefulness in "medication management".[1,2] and expressed willingness to trust AI-generated dosing recommendations.[2]

KEYWORDS: artificial intelligence, ChatGPT, knowledge attitude practice, pharmacy students, self-medication, self-diagnosis, patient safety, medical education.

1. INTRODUCTION

Since ChatGPT's public release, generative AI tools have proliferated, altering how health-professions students engage with medical data.[1,5] Because pharmacy practice is at the nexus of drug information science, patient counseling, and increasingly automated clinical decision-support, pharmacy students are particularly exposed to this change.[2,33,56,58] General-purpose conversational AI is directly available to students and, consequently, to the general public for unsupervised self-diagnosis and self-medication queries, in contrast to previous "expert system" applications of AI in radiology or pathology, which are usually implemented by trained specialists inside regulated clinical workflows.[59,73,76,78] This leads to a unique knowledge-attitude-practice (KAP) issue: people who are trained to become the professional safeguard against the use of hazardous or illogical medications are also using the same ungoverned instruments as a first-line source of information.[37,42,52]

In pharmacy and medical education research, a KAP framework—which evaluates people's knowledge, beliefs, and behaviors—has long been utilized to find gaps before focused intervention .[2,7,9,20,68] When it comes to AI, KAP surveys usually ask on (i) familiarity with AI concepts like machine learning and deep learning, (ii) views toward AI's role in patient care, diagnosis, and education, and (iii) self-reported frequency and purpose of AI tool use.[2,3,7,9] In order to create a composite picture of AI-KAP relevant to self-diagnosis and self-medication behavior among pharmacy trainees, this review synthesizes nine primary KAP studies, including those on healthcare professionals in India.[1] pharmacy students and graduates in Saudi Arabia.[2] pharmacy students in Zambia.[3] medical students in rural India.[4] medical students in Malaysia.[5] doctors and medical students in Saudi Arabia.[6] health-professions students in Jordan.[7] rheumatology professionals in India.[8] and doctors/medication behavior in Syria.[9]

2. METHODS

This is not a systematic review, but rather a narrative synthesis. From uploaded full-text publications, nine primary cross-sectional KAP studies were found and thoroughly examined. The study population and setting, sample size, knowledge, attitude, and practice item wording and results, related demographic characteristics, impediments found, and specific mentions of AI use for drug information, medication management, dosage, or diagnostic tasks were among the data that were retrieved. Secondary sources are cited to contextualize findings where the primary studies identified additional empirical or conceptual literature pertinent to AI in medication use, education, or self-care. This review synthesizes proxy indicators drug-information retrieval, medication-management attitudes, dosing-recommendation trust, and chatbot practice frequency as the closest available evidence base and highlights this as a priority gap for future primary research because no identified study focused solely on AI-assisted self-diagnosis and self-medication among pharmacy students.

3. The Global Landscape of AI-KAP Research in Pharmacy and Health Education

Over the past four years, AI-KAP surveys have spread throughout pharmacy, medicine, dentistry, nursing, and allied-health cohorts. These surveys primarily follow a template that was first made popular in Pakistan and Syria.[9,68] and then modified in Jordan.[7] France.[23] Nigeria.[36,43] Oman.[42] Sudan.[18] and Saudi Arabia.[2,6,35] Multinational surveys conducted throughout MENA pharmacy faculties.[20,33] Jordanian and Palestinian pharmacy/medicine cohorts.[55] Zambian pharmacy students.[3] and Saudi pharmacy students and graduates centered in the Asir region.[2] are examples of pharmacy-specific KAP work. A recurring trend is confirmed by systematic studies of this literature.[14,60] there is a high level of knowledge of AI as a concept, but there is still a lack of formal instruction and practical ability. This pattern is referred to as the "awareness–practice gap".[2,7]

4. Knowledge Domain

4.1 General awareness versus conceptual depth

In all nine studies, 100% of Malaysian medical students.[5] 98.4% of Saudi medical students/interns/residents.[6] 98.3% of Indian rheumatology professionals.[1,8] 96.6% of Zambian pharmacy students.[3] and 82.6% of Saudi pharmacy students/graduates.[2] reported having heard of artificial intelligence. But knowledge of AI subtypes, such as machine learning, deep learning, and generative AI, declines dramatically: 54.7% in Malaysia.[5] 50.5% in Saudi Arabia.[6] 54.3% among Indian rheumatologists.[8] 45.7% among Syrian participants.[9] and barely 34.0% among pharmacy students in Zambia.[3] This "know-of but do-not-understand" pattern appears frequently in the literature on AI in medical education in general.[32,44,46,48,59] and is in line with previous research on low AI literacy among Pakistani physicians.[68] Arab medical students.[13] and Jordanian health-professions students.[7]

4.2 Knowledge of medical/pharmacy-specific applications

The weakest sub-domain is always knowledge about AI's particular uses in healthcare. In the reviewed studies, only 26.4–48.9% of respondents could name specific medical applications of AI.[5,6,9] Among Saudi pharmacy respondents, awareness of AI in pharmacy-specific tasks like medication management, pharmacovigilance, or drug discovery ranged from 29–36%.[2] and among Zambian pharmacy students, only 47.3% knew of any AI application in health sciences/pharmacy.[3] Only 25.5% of Syrian respondents.[9] 40.6% of Saudi respondents.[6] 17.9% of Zambian pharmacy students.[3] and 7.2% of Saudi postgraduates.[6] reported having received formal curriculum exposure. The primary cause of the knowledge gap is frequently shown to be this training shortfall.[7,9,17,45,59,60]

4.3 Demographic correlates of knowledge

Numerous research discovered a substantial correlation between knowledge ratings and ethnicity, gender, academic level, and specialty. Among Malaysian medical students, Indian ethnicity was linked to significantly greater knowledge (Chi = 12.95, $p = 0.005$)

In Zambia, male gender was linked to greater knowledge ($X^2 = 11.612$, $p = 0.001$).[3] but not in Saudi Arabia.[6] or

India.[4] The knowledge and attitude scores of Jordanian pharmacy/PharmD students were considerably higher than those of medical/dentistry students.[7] Although results on academic year were mixed.[4,7,9] faculty and senior trainees generally fared better than junior students.[1,9]

5. Attitude Domain

5.1 General favorability

In all contexts, attitudes regarding AI in healthcare are overwhelmingly positive: 93.8% of Indian medical students.[4] 90.6% of Malaysian students.[5] 81.5% of Indian rheumatologists.[1,8] believe that AI improves patient care, and 71.2–83% of Saudi pharmacy respondents.[2] and Jordanian health-professions students.[7] agree that AI improves education or clinical decision-making. This is consistent with results from global pharmacy surveys.[20,33] Turkey.[97] and Kuwait.[98]

5.2 Concerns and ambivalence

Despite widespread optimism, significant minorities voice concerns regarding (i) data privacy and security (46% in India. (1); 64.2% in rheumatology.[8] a majority obstacle category across studies); (ii) over-reliance and de-skilling (16.6–50% across studies).[1,8] (iii) AI replacing human judgment or the doctor–patient/pharmacist–patient relationship.[1,5,7,9] and (iv) the accuracy/reliability of AI-generated drug data.[2] This final finding clearly relates to the risk of self-medication: even when using such tools, pharmacy students themselves have significant doubts about the quality of AI drug knowledge.

5.3 Ethical and regulatory attitudes

Strict regulatory monitoring of AI in healthcare is supported by strong majorities across studies (India: ~80%.[1] Zambia: high support for curriculum inclusion.[3] Jordan: significant support for teaching AI ethics.[7] In certain cohorts, such as Saudi medical students, ethical issues were placed lower than accuracy concerns.[6] This pattern was also observed in Jordan, where skepticism about AI replacing human professors was assessed as more important than ethical considerations.[7]

6. Practice Domain

6.1 Overall utilization rates

Only 33.5% of Indian rheumatology professionals (8), 40% of Indian HCPs generally.[1] 42.3% of Saudi pharmacy students/graduates.[2] and 42.3% (India, HCP study) or 62.6% (Saudi doctors/interns/students).[6] reported regular clinical or professional use. In contrast, 84.5% of rural Indian medical students reported using AI tools for research.[5] The difference between "ever used" and "regularly use" highlights the fact that most involvement is academic or exploratory rather than incorporated into normal clinical or self-care decision-making.

6.2 Purpose of use: academic tasks dominate

Preparing presentations (34% in rural Andhra Pradesh).[4] summarizing content, exam preparation, spelling/grammar checking (38.2% in Jordan).[7] and literature/research assistance (35.5% in Jordan).[7] were the most frequently reported uses of AI in almost every study. Career-oriented or clinical uses, such as direct patient care activities, exam preparation for licensing, and personal choices/career advising (26.5%, Jordan).[7] were typically the least mentioned.

6.3 Drug-information and medication-related use: the closest proxy for self-medication behavior

The Saudi pharmacy KAP study.[2] which explicitly measured "using AI for getting drug information," provides the most direct evidence pertaining to AI-assisted self-diagnosis/self-medication. 35.4% of pharmacy students and 29.7% of bachelor's-level pharmacists reported using AI for this purpose, with ChatGPT being the most popular tool (42.3% of students; 36.0% of bachelor's graduates).[2] In terms of attitudes, the same study found that 71.2% of respondents thought AI could improve pharmacy education and 68.4% thought it could improve clinical decision-making. Significant percentages agreed that AI could help identify medication errors (36.0–37.5%), support personalized AI/ML-based dosage recommendations (23.4–27.3% agreement, with comparable proportions disagreeing), and predict adverse drug reactions.[2] Although the same cohort expressed low confidence in the factual accuracy of AI-generated drug data (12–13% trust), this is the clearest indication in the literature that pharmacy trainees are already using general-purpose conversational AI as an informal drug-information and quasi-clinical-decision resource.[2] While 91.6% of the Zambian cohort had "applied AI in their studies" compared to only 46.6% who would consider a clinical AI-assisted diagnostic workflow in future practice.[3] note-taking, PowerPoint preparation, and "understanding complex concepts" outranked any explicit clinical or self-care use.[4] This suggests that the willingness to extend AI use toward clinical/self-care decisions lags behind general academic adoption.

6.4 Barriers to structured, safe practice

Lack of knowledge/expertise (52.8% in Jordan.[7] 52.8% cross-referenced in rheumatology.[8] lack of formal training (43.1–70.1% across studies) (2,6,7); restricted access to technical equipment/infrastructure (42.4%, Jordan).[7] patient/data privacy and security concerns (64.2%, rheumatology.[8] 46%, India.[1] and curriculum gaps (36.7%, Jordan).[7] were the most commonly mentioned obstacles to appropriate AI integration. Notably, only 39% of respondents mentioned "lack of interest" as a barrier.[9] indicating that the lack of institutional guidance rather than motivation is the main barrier to safe, structured AI use. This finding has direct implications for the risk of unsupervised self-medication because motivated but untrained users are the group most likely to replace professional consultation with AI output.

7. Determinants of KAP Relevant to Self-Diagnosis/Self-Medication Risk

Multiple studies identified determinants that plausibly modulate self-medication risk via AI

- Younger age and an earlier academic year are linked to higher AI use and more positive attitudes in a number of cohorts.[1,4,9] This suggests that younger pharmacy trainees may be more likely to consult AI informally, including for personal health inquiries, even though their critical appraisal skills for medical information are still developing.[44,46,59,60]
- Gender: mixed results showed that male students had higher practice/attitude scores in Malaysia.[5] and Zambia[3] but there were no discernible gender differences in knowledge in a number of other cohorts.[4,6,7] This suggests that gender is not a valid universal predictor and should not be overinterpreted.
- Regional/institutional exposure: Saudi regional data revealed localized "hot spots" of increased AI engagement (e.g., Riyadh, some Asir localities) linked to digital infrastructure and institutional emphasis rather than intrinsic student ability.[2] This suggests that the risk of self-medication via AI may be unevenly distributed geographically according to internet access and exposure rather than professional training level.
- Professional role: In one Indian KAP study, nurses had the highest willingness to receive training (97.05%) despite having a lower awareness of legal and regulatory issues than faculty and medical students.[1] This pattern suggests that the willingness to learn safe practices is not limited to those who are already knowledgeable, which is encouraging for targeted intervention.

8. Risk Landscape: AI-Enabled Self-Diagnosis and Self-Medication Among Pharmacy Trainees

Drawing the above threads together, several risk themes emerge that are directly relevant to a dedicated KAP study on AI-based self-diagnosis and medication among pharmacy students:

1. A mismatch between accuracy and trust. Despite expressing low confidence in the accuracy of AI-generated medication data.[2] and being aware that AI outputs may contain fake (or "hallucinated") information.[2,47,51] pharmacy students currently utilize conversational AI for drug-knowledge retrieval.[2] This discrepancy between expressed skepticism and practice is a characteristic of "convenience override," where accessibility takes precedence over verification when time is of the essence. This dynamic has been well documented in the literature on general LLM adoption.[37,38,41,47,61]

2. Unsupervised questions about customisation and dosage. Significant minorities of pharmacy respondents supported the use of AI in "personalized dosage recommendation systems".[2] and disease-risk prediction for adverse drug effects.[2] This shows an openness to AI-mediated clinical reasoning that, if applied to self-medication (e.g., a student self-adjusting an OTC or prescription dose based on a chatbot's suggestion), could circumvent crucial clinical safeguards like allergy history, drug–drug interaction screening, and renal/hepatic dose adjustment—tasks that AI language models are not validated to perform reliably.[37,53,54]
3. The primary weakness is the lack of formal training. Formal teaching in AI use, restrictions, and verification techniques was the exception rather than the rule in all of the evaluated studies.[2,3,6,7,9,45,59,60] As a result, rather than receiving structured, competency-based instruction, students are developing useful AI habits—including self-care-related habits—through informal, unsupervised inquiry.[54,56,59,40]
4. Data privacy and ethical blind spots. Pharmacy students may not fully understand the data-governance risks of using consumer AI chatbots for personal health queries, as evidenced by the fact that ethical considerations, such as the privacy implications of entering personal symptoms or medication histories into third-party AI tools, were rated as lower priority than accuracy or workload concerns in several cohorts.[2,6,7]
5. Inequity depending on region and resources. Students in under-resourced environments may be more likely to rely on unsupervised AI for self-care decisions and less likely to have received guidance on its safe use because access to structured AI training correlates with institutional and regional digital infrastructure rather than curriculum design.[2,7]

9. Implications for Pharmacy Education and Policy

The reviewed literature converges on several recommendations directly transferable to a dedicated program addressing AI-based self-diagnosis and self-medication risk among pharmacy students:

- Early pharmacy curriculum include structured AI-literacy modules that address basic AI/ML principles, medication-specific applications, and clear guidance on the limitations of consumer chatbots for activities like dosing or diagnosis.[2,7,45,56,59,60]
- Instead of merely accepting chatbot output, critical-appraisal training for AI-generated pharmacological information should include triangulation against reliable sources (formularies, pharmacopoeias, peer-reviewed literature).[2,7]
- Based on suggestions from Indian.[4] Saudi.[2,6] and Jordanian.[7] cohorts, simulation-based and case-based exercises allow students to practice differentiating appropriate AI-supported tasks (literature summarization, administrative documentation) from inappropriate ones (unsupervised diagnostic or dosing decisions).
- Clear ethics and data privacy training, since ethical

issues were undervalued in comparison to accuracy/workload issues in certain cohorts.[2,6,7]

- Institutional policy and faculty development, as student behaviour is more strongly correlated with the availability of organized supervision from teachers.[2,7,60] than with pure drive.
- Implementation that is responsive to regional differences in AI infrastructure and exposure across institutions and regions.[2,7]

10. Limitations of the Current Evidence Base

The closest available proxies are items on drug-information retrieval, medication-management attitudes, and dosing-recommendation trust embedded within broader AI-KAP instruments. No study found in this synthesis directly and thoroughly measured "AI-based self-diagnosis and medication" among pharmacy students as a named, dedicated construct.[2] Convenience sampling, self-reported cross-sectional data that is prone to recall and social desirability bias, single-institution settings that restrict generalizability, and heterogeneous, non-validated KAP instruments that make cross-study comparison difficult are all used in the majority of studies.[2,3,4,5,6,7,8,9] Several instruments also showed only moderate internal consistency in specific sub-domains (e.g., Cronbach's $\alpha = 0.592$ for the "perception" domain in the Saudi pharmacy study).[2] and regional oversampling (e.g., 60% of Saudi respondents from the Asir region) limits the generalizability of subgroup findings.[2] These limitations underscore the need for a purpose-built, validated KAP instrument specifically targeting AI-assisted self-diagnosis and self-medication behaviour in pharmacy student populations.

11. CONCLUSION

Nine cross-sectional KAP studies involving general healthcare professionals, medical students, and pharmacy students in South Asia, the Middle East, Southeast Asia, and Sub-Saharan Africa show a consistent pattern: almost universal awareness of AI, moderate-to-weak conceptual knowledge of its medical applications, generally positive but ambivalent attitudes tempered by privacy and accuracy concerns, and practice that is concentrated in academic rather than clinical or self-care tasks. However, a documented and growing minority of pharmacy students are already using conversational AI for quasi-clinical and drug information. The combination of high accessibility, no formal monitoring, and ongoing deficiencies in critical-appraisal abilities shows that AI-assisted self-diagnosis and self-medication is an emergent, understudied habit among pharmacy trainees. In addition to structured curriculum reform, ethics and data-privacy training, and institutional policy, dedicated, validated KAP research specifically focusing on this construct is required to guarantee that pharmacy students, as future guardians of safe medication use, acquire the skills necessary to use AI tools responsibly rather than as an unsupervised replacement for professional clinical judgment.

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