



COMPETENCY-BASED PHARMACY EDUCATION FROM 1980 TO 2023: A NARRATIVE REVIEW

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ABSTRACT

The pharmacy education competency framework curriculum that will impact knowledge, critical reasoning, skill and interpersonal communication is a critical need. Competency-based curriculum that can deliver competent pharmacists must be engaged to infuse the requisite knowledge and skill that would provide pharmaceutical care that is effective, efficient and safe for patients. Thus, the study aimed to conduct a narrative review of competency-based pharmacy education from 1980 to 2023 by reviewing studies that reveal the extent of research into the provision of a competency-based education. Database searches yielded 20 articles that met the eligibility criteria. 40% of the studies are reviews, while 35% are cross-sectional studies. Studies in Nigerian settings were 20%. Questionnaire and Electronic databases were the major instruments used in the studies, constituting 70%. Many of the studies highlighted that competency-based pharmacy education derived from a framework curriculum will promote knowledge-driven professional practice.

KEYWORDS: Pharmacy, Competency-based, Education, Curriculum.

INTRODUCTION

Pharmacy education is focused on providing the requisite competences and high skills needed to perform pharmaceutical roles of a caregiver [Udoh *et al.* 2018]. Professional knowledge, critical reasoning, research skills, cultural sensitivities, humility and interpersonal skills are critical requirements needed to carry out this role [Suka, Adisa, Isah and Biambo, 2021]. Therefore, Pharmacy education should produce competent graduates who can navigate complex social, environmental, ethical and behavioural issues while performing their professional duties [Saka *et al.* 2021]. Pharmacists are in responsible positions within the health care system and require high quality competency-based education that will ultimately translate to improved health care and patient safety [Koster, Schalekamp and Meijerman, 2017, Katajavuori *et al.* 2017]. Koster *et al.* 2017 advocated the transformation of the traditional pharmacy training into a competency-based pharmacy education that requires the re-orientation of teachers and the re-designing of curriculum to ensure adequate training. They opined that given the high rate of migration of pharmacists from African countries the training accorded should be at par with the global healthcare workforce in

the country where they now constitute a sizable proportion of the workforce. Such competency-based training will produce practice-ready graduates of pharmacy that will foster norms that reflect social accountability.

Competencies are the requisite knowledge, skills and attributes that guarantee successful performance in daily practice essential for effective professional practice [Udoh *et al.* 2021]. The performance consistent with the requisite knowledge and skill will positively influence the care quality and patient safety. Competency-based curriculum is learner-centred, focuses on outcomes, emphasises abilities, and has a reduced emphasis on time-based training. It also has measurable and assessable components which include knowledge, skill, values and attitudes [Koster *et al.* 2017]. Katajavuori *et al.* 2017 prescribed a competency-based education process that defines learning outcomes which result from constructively aligned curricula. These are translated to real-life teaching practice through the competency framework. Udoh *et al.* 2021 in their research concluded that a competent pharmacist would professionally work to improve therapeutic outcomes, minimise medication

errors and ensure patient safety. These frameworks, when used alongside standards of practice, facilitate performance and promote identification of knowledge gaps and professional development. [Udoh *et al.*2021]. Therefore, this study aimed to conduct a narrative review of competency-based pharmacy education from 1980 to 2023.

METHODS

Study Area

The study covered prior works on competency-based pharmacy education from 1980 - 2023.

Study population and type of study included

Studies that passed the eligibility criteria found in databases such as Google Scholar, PubMed, CINAHL and other search engines using keywords related to competency-based education were included in the study. Tables were generated to provide study-objective targets after due selection based on selection criteria of the study.

Eligibility criteria

Studies published in English Language related to competency-based education and published between 1980 and 2023.

Ineligibility criteria

Studies not published in English Language and are outside the scope of the study and all studies with conflict of interest stated.

Study design

Study was a narrative overview of studies related to competency-based education in pharmacy.

Data sources

Literature searches were conducted using Google scholar, PubMed and CINAHL.

Article search process

The search reviewed relevant journals and articles on competency-based education in pharmacy from 1980 to 2023. The search terms included keywords in databases related to competency-based pharmacy education. Three main databases were considered namely Google Scholar, PubMed and CINAHL; Abstract and full-text articles were obtained and assessed for eligibility. A total of 2365 articles were obtained relating to competency-based pharmacy education; 1900 from Google Scholar, 465 from PubMed and 0 from CINAHL based on the selection criteria (Fig. 1). Duplicated articles were removed with further screening, a total of 20 articles were used for the review.

Ethical approval

Ethical approval was not obtained for the study as it did not involve any invasive data collection method.

Data analysis

The data extracted from the selected articles were entered into a spreadsheet for analysis. The variables and references were noted.

RESULTS

Database searches yielded a total of 2,365 articles using the relevant keywords related to competency-based Pharmacy education, of which 1900 from Google Scholar, 465 from PubMed and none from CINAHL.

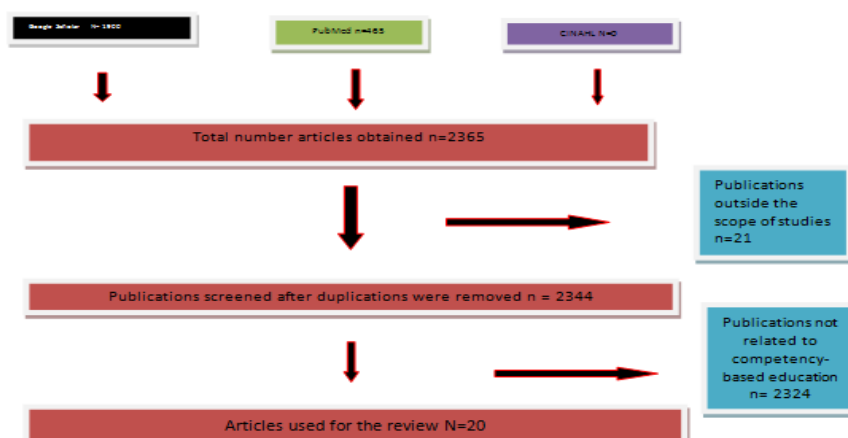


Figure 1: Flow Chart Of The Study Articles Selection Process.

The screening of articles yielded 20 articles that met the eligibility criteria (Figure 1 and Table 1). Many of the studies highlighted that competency-based pharmacy education derived from a framework curriculum will promote knowledge-driven professional practice. Some studies provided a glimpse of information about possible perceived deficiency in the present curriculum.

Many of the studies (n=6, 30%) were published in 2021, in 2012 (n=3, 15%), while 2016 had the least (n=1, 5%), as shown in Table 2. Many of the studies are reviews (n=8,40%), while n=7, 35% are cross-sectional studies (Table 3). Studies in Nigeria settings were (n=4,20%), but studies within the global coverage dominated (Table 4). Questionnaire and Electronic databases were the major instruments used in the studies (Table 5).

Table 1: Evidence-Based Table of Competency-Based Pharmacy Education Studies.

<i>S/N</i>	<i>References</i>	<i>Title</i>	<i>Location</i>	<i>Design</i>	<i>Year of publication</i>	<i>Study outcome</i>	<i>Inclusion criteria</i>	<i>Study recommendations</i>	<i>Study Instrument</i>
1	Amorha <i>et al.</i> 2020	Community pharmacists' competence for Educating Asthmatic patients	Enugu State Nigeria	Cross-sectional study	2020	Community pharmacists' knowledge of the use of inhalers and pick flow meter was poor.	Competency in the use inhaler.	There is a need to initiate education of community pharmacists to enhance their asthma management	Questionnaire
2	Adje & Umeokwoaka 2023	An assessment of community pharmacists competence and involvement in Adolescent sexual education and reproductive health	Delta state, South-south	Cross-sectional study	2023	Community pharmacist's involvement in Adolescent sexual health education is high and has confidence in the participation.	Competency of community pharmacists' in sexual health education	The option of the delivery of adult sexual health education is worth exploration.	Questionnaire
3	Ozoh <i>et al.</i> 2018	The competence of community Pharmacists in Lagos, Nigeria on correct inhaler techniques	Lagos, South-West, Nigeria	Cross-sectional study	2018	Poor competence of asthma management techniques of community pharmacists.	Community pharmacists attending CME programs on respiratory infections and marketing strategy at two locations in Lagos.	The strategic roles of pharmacists in the health care delivery should be harnessed through training.	Questionnaire
4	Udoh, Bruno and Bates.2018	A survey of pharmacists' perception of foundation-level competencies in African countries	24 Countries in Africa	Cross-sectional study	2018	The Global Competency Framework is relevant to improving practice competence	Information on the Global Competency Framework.	Nil	Questionnaire
5	McMullen <i>et al.</i> 2023	A systematic review of contemporary competency-based education and training for pharmacy practitioners and students	Survey from an electronic database.	Systematic reviews	2023	The CBPE has relevance across a variety of contexts and has been shown to facilitate the Harmonisation of CBE	Information on competency-based education	To bridge any gaps between the intended curricula and the learner's experience, a consensus and shared vision for all stakeholders are reached.	Database sites

6	Katajuvori <i>et al.</i> 2017	Competence-Based Pharmacy Education in the University of Helsinki	University of Helsinki,	Review	2017	Competence-based curriculum can be created only in close co-operation with the stakeholders, including teachers and students.	Nil	Definitions of competences and learning outcomes in pharmacy education	Documentations
7	Sin, Y H. 2021	Competency Assessment Tool and Faculty Assessors for Competency-based Pharmacy Education: A Preliminary Study of Its Applications and Advantages	Korea	A survey of pharmacy students	2021	CBA tool is valuable to assess and improve student's ability.	All students in the faculty	Faculty assessors to prepare themselves for patient roles for cost and time minimization	Questionnaires
8	Koster, Schalekamp, and Meilerman, 2017	Implementation of Competency-Based Pharmacy Education	Non	Description of essential steps in designing CBE curriculum	2017	Successful implementation of CBPE requires a system of effective quality management and continuous professional development as a teacher	NA	Suggestions for the organization of CBPE are provided to facilitate the implementation of CBPE.	Documentation
9	Saka <i>et al.</i> 2021	Pharmacy graduates' perceptions of competency, integration, and social accountability in the undergraduate curriculum of pharmacy schools in Nigeria	20 Accredited Schools in Nigeria	Cross-sectional survey	2021	Undergraduate pharmacy curriculum perceived to be deficient in course content	Graduates from 20 schools between 2012 and 2020	The pedagogy strategy for learning cultural sensitivity should be further interrogated	Questionnaire
10	Katoue and Schwinghammer 2020	Competency-based education in pharmacy: A review of its development, applications, and challenges	Global coverage	A comprehensive literature review	2020	The adoption of CBE can assist developing countries in tailoring pharmacy education to meet societal needs	Key words relating to the topic from 1975-2019	Successful implementation of CBPE programmes requires strong and supportive institutional leadership	PubMed, Scopus and Google electronic databases
11	Udoh <i>et al.</i> 2021	The development, validity and applicability to practice of pharmacy-	Global coverage	Systematic Review	2021	Competency Framework used for regulation of career	Pharmacy-related frameworks.	Disparities in framework terminologies and	PubMed/Medline, CINAHL, Embase, ERIC,

		related competency frameworks: A systematic review				entry and benchmark standard are now common because of global reforms		development methods suggest the need for harmonization.	Scopus, ProQuest and PsycINFO electronic databases
12	Udoh et al.2021	The effectiveness and impact on performance of pharmacy-related competency development frameworks: A systematic review and meta-analysis	Global coverage	Systematic review survey	2021	The competency-based framework used to regulate career entry, benchmark standard.	The information accessed from data bases relating to competency-base pharmacy education	Further evaluative studies are needed.	Electronic databases
13	Mestrovic et al.2012	Individualized Education and Competency Development of Croatian Community Pharmacists Using the General Level Framework	Global coverage	Prospective cohort longitudinal study. Study	2021	effectiveness of an evidence-based competency framework, confirmed that GLF is a valid educational tool for pharmacist development	Complementary	effectiveness of an evidence-based competency frame	e-General Level Framework (GLF) as an educational tool i
14	Bajis et al.2016	Competency-based pharmacy education in the Eastern Mediterranean Region—A scoping review	Eastern Mediterranean Region (EMR)	Systematic Review	2016	EMR—a region with extensive pharmacy history yet a vast variation in pharmacy educational and practice needs. Despite scarcity of published literature, the results provide a snapshot of competency education.	Competency review framework.	Recommendation for exploration of the gap and variation in pharmacy educational and practice needs	Search engines in electronic media
15	Hernández-de-Menéndez, and Morales-Menendez,2017	Competency Based Education – Current Global Practices	Global coverage	Documentary	2017	Mainly, effective communication, critical thinking and lifelong learning promoted competencies.	Competency terms and practices items	The gap between the supply and demand of skilful people can only be reduced if all the concerned parties work together in a coordinated manner.	Documentary
16	Jacob et al.2022.	Competency-Based Assessment in Experiential Learning in	Scotland	Consolidated Criteria for Reporting	2022	Real-time feedback from workplace-based practitioners provides	Competency-based experiential	Training and resources should be tailored to the needs.	Semi-structured one-on-one interviews.

		Undergraduate Pharmacy Programmes: Qualitative Exploration of Facilitators' Views and Needs (ACTp Study)		Qualitative Studies (COREQ)		benefits for self-development.	learning.		
17	Jacob <i>et al.</i> 2021.	Competency-Based Assessment in Experiential Learning in Undergraduate Pharmacy Programmes.	UK	Cross-sectional study	2021	EL facilitator assessment of students would allow for more accurate evaluation of students in the practice setting, while barriers such as the burden of time and lack of marking consistency exist.	Competency-based experiential learning in pharmacy schools	The tools and methods used should be informed by the competencies being assessed.	Questionnaire
18	Oroszi, T. (2020).	Competency-Based Education.	Global coverage	Documentary	2020	Competency-based education prepared the student for effective professional practice.	Competency profile	Adoption of competency education recommended	Documentation
19	Croft <i>et al.</i> 2019	Current Trends and Opportunities for Competency Assessment in Pharmacy Education– A Literature Review	Global coverage	Literature review	2019	Pharmacy reform through Competency education.	Literature review of competency education	Identifies 3 areas of practice for expansion and improvement.	Web engines and sites using the Medical Education Research Study Quality Instrument (MERSQI).
20	Ekeigwe <i>et al.</i> 2022	Describing competency requirements for competency-based regulatory sciences education in sub-Saharan Africa –A qualitative systematic review	Global coverage	Systematic review using framework synthesis	2022	Three broad clusters of competencies identified, including enabling behaviours, knowledge, and skills	Described a competency-based education requirement	The identified competencies will provide the development of entry points for education.	Documentations

CME=continuing medical education, CBE=Competency-based education, CBA=Competency-based assessment, CBPE=competency-based pharmacy education.

DISCUSSION

The pharmacist's responsibility to maximise patients' pharmaceutical benefits through therapeutic monitoring can only be achieved through the acquisition of adequate competencies that are provided by an enhanced curriculum (Berenguer, La Casa, de la Matta and Martin-Calero, 2022). Jacob *et al.* (2022) opined that professional education was aimed at producing healthcare providers who are competent to offer effective

and safe services in their practice settings, which can meet the patients' positive therapeutic outcomes. Strategies for effective communication, critical thinking and lifelong learning are key promoters of competency-based education that provide students a foundation for profitable professional practice. Hence calls for reforms that will enhance the pharmacy curriculum to infuse enabling behaviour, knowledge and skill for a robust professional practice in various practice settings.

Table 2: Year of Publication.

S/N	Year	Frequency(f)	Percentage (%)
1	2016	1	5
2	2017	3	15
3	2018	2	10
4	2019	1	5
5	2020	3	15
6	2021	6	30
7	2022	2	10
8	2023	2	10

Low knowledge of inhaler techniques by community pharmacists reflects a deficiency in the curriculum content, as perceived by the report of Amorha *et al.* (2020). The competencies of professionals will determine their care provision potential and the safety of

the patients. The community pharmacists' preparedness to offer sexual education to their patients must be matched with their competence to offer the quality education demanded in their professional services.

Table 3: Types of Study.

S/N	Study Types	Frequency(f)	Percentage (%)
1	Cross-sectional study	7	35
2	Review studies	8	40
3	Descriptive studies	1	5
4	Longitudinal studies	1	5
5	Documentary	2	10
6	Qualitative studies	1	5

Competency-based assessment (CBA) tools are valuable for assessing the competencies developed by the training offered to students during training. Adoption of Competency-based Education (CBE) will assist the development of a tailored pharmacy education to meet the social needs of patients. The necessary competency-based framework that will enhance professional services must be developed to ensure proficiency development with a valuable career entry point and achievable required benchmarks. Ozoh *et al.*, 2018 reported the promotion of competencies by effective communication, critical thinking, and lifelong learning. This will require self-development as prescribed by Rhoneya *et al.*, 2024.

Pharmacy competency-based education remains a critical need for the required proficiency in healthcare in all practice settings to respond to societal healthcare provision. This will produce the enhanced training that is evaluated through experiential learning facilitated by assessments. The framework for an enriched curriculum that is competence-oriented to provide reforms of behavioural and skill capacity and to translate knowledge

and skill into professional outcomes needs to be provided.

The researcher's opinion for the development of a competency-based education curriculum that will promote teaching and assessments with a developmental mindset that meets the demands of excellent therapy for effective and safe delivery of care should be critically examined. The Nigerian pharmacy educational system must be propelled with an adequate curriculum that will prepare pharmacists for the high skills that will position them for effective services with the global practice standard. A limitation of the study is that previous studies published in English only were reviewed. Some articles relevant to the study may have been left out due to search limitations. Some limitations associated with varying levels of bias may have existed in the primary studies and may have affected the outcome of the study.

Table 4: Study Location.

S/N	Study location	Frequency(f)	Percentage (%)
1	Nigeria	4	20
2	Africa	1	5
3	Helsinki Finland	1	5
4	Korea	1	5
5	Eastern Mediterranean Region	1	5
6	Scotland	1	5
7	UK	1	5
8	Global coverage	10	50

CONCLUSION

Competency-based education remains a critical need, and a corresponding curriculum that can deliver the requisite

knowledge and skill must be engaged in practice to provide care that is effective, efficient and safe for patients.

Table 5: Study Instrument.

S/N	Study instrument	Frequency(f)	Percentage (%)
1	Questionnaire	7	35
2	Electronic database sites	7	35
3	Documentations	5	25
4	Semi-structured interview	1	5

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Conflict of Interest

The authors have none to declare.

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