Literature Review

Literature Review on Curriculum Development

Fraz Noor[1]*, Pakeeza Aslam[2], Qurutulain Mushtaq[2], Sania Maqbool[3], Junaid Sarfraz[4]

[1]District Headquarter Hospital Narowal, Pakistan.
[2]Department of Obs and Gynae, Combined Military Hospital Lahore Medical College, Lahore, Pakistan.
[3]Department of DPT, Lahore College for Women University, Lahore, Pakistan.
[4]Dean, Khyber Teaching Hospital Peshawar, Pakistan.
Corresponding Author: Fraz Noor; Email: aslampakeeza3@mail.com
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ABSTRACT

Background: Curriculum development in medical education is vital at all educational levels, from undergraduate to postgraduate and professional education focused on patient care. Understanding the systematic approach to curriculum development and evaluation is essential for maximizing the potential of medical education initiatives.

Objective: The objective of this review was to explore and synthesize the existing literature on curriculum development in medical education, focusing on the processes and outcomes, and to provide recommendations for effective curriculum design and implementation.

Methods: A comprehensive literature review was conducted using multiple electronic databases, including PubMed, MEDLINE, ERIC, Scopus, Web of Science, and Google Scholar. The search terms included "curriculum development," "medical education," "learning outcomes," "educational strategies," "assessment tools," "curriculum implementation," and "curriculum evaluation." Articles published in peer-reviewed journals were included based on relevance and methodological rigor. Data were synthesized using a narrative approach.

Results: The review identified three types of curricula: explicit, implicit, and null. The explicit curriculum is structured and publicly available with clear learning objectives. The implicit curriculum is influenced by geographical, political, and socioeconomic contexts. The null curriculum refers to aspects not covered despite being planned. Key steps in curriculum development included needs assessment, content determination, goal and objective setting, selection of educational strategies, implementation, and evaluation. Educational strategies varied, including lecture-based learning, hands-on skill delivery, flipped classroom, and case-based learning. Continuous evaluation, both formative and summative, was essential for curriculum adaptation and improvement.

Conclusion: A systematic approach to curriculum development in medical education ensures comprehensive and adaptive educational programs. This process addresses the diverse and evolving needs of learners and society, ultimately enhancing the quality of medical education. Effective curricula prepare healthcare professionals with the necessary knowledge, skills, and attitudes for high-quality patient care and adaptability to changing healthcare environments.

Keywords: Curriculum development, Medical education, Learning outcomes, Educational strategies, Curriculum implementation, Curriculum evaluation.

INTRODUCTION

Curriculum development is a crucial component at all levels of medical education, encompassing undergraduate and postgraduate teaching, as well as professional education with a focus on patient care. Awareness of the curriculum development process and attention to desired outcomes are essential for maximizing the potential of medical education initiatives. To demystify the process and optimize educational outcomes, a systematic approach to curriculum development, including evaluation, is necessary. The process involves six steps: identifying the content, determining learning goals and outcomes, selecting educational strategies, utilizing assessment tools, implementing the curriculum, and conducting curriculum evaluation.

The term "curriculum" originated from the Latin word meaning "running" or "racecourse" and has evolved to signify a course of study or a planned educational experience (1; 2). In medical education, curricula vary significantly in size and scope, from learning to take vital signs in the first year of medical school (3; PA et al. 2016) to extensive programs aimed at reducing patient care errors

through improved transitions of care. The curriculum's essence lies in defining the educational experience's "what," describing intended learning outcomes in terms of knowledge, skills, and attitudes. This description must be systematic, concrete, and achievable, guiding the implementation process.

Kern's 2009 approach to curriculum development outlines several foundational principles. First, educational programs inherently possess aims, goals, and objectives, whether clearly articulated or not. Second, medical educators have professional and ethical obligations to meet the needs of learners, patients, and society. Third, educators must be accountable for both the intended and achieved curriculum. Fourth, a logical and systematic approach to curriculum development is essential to achieve learning outcomes (3). A curriculum must be responsive to societal changes, encompassing the complete learning experience of individuals both within educational institutions and in the broader community.

Curriculum development primarily focuses on content and related areas, impacting a wide range of programs, courses, and student experiences. It should broadly define the institution's mission and goals, constituting a broad spectrum of student experiences in school settings, while instruction focuses on delivering these experiences. A well-defined curriculum acts as a roadmap, detailing various activities with measurable outcomes that students must achieve, ultimately assessed to determine if the intended results have been met (4; 5). This systematic approach ensures that the curriculum not only meets educational standards but also addresses the evolving needs of society and the medical profession.

MATERIAL AND METHOD

This study employed a systematic approach to curriculum development within medical education, focusing on a comprehensive literature review. The aim was to identify, analyze, and synthesize existing research on the process and outcomes of curriculum development. The review followed a narrative synthesis method, integrating findings from various sources to provide a coherent understanding of the topic. The research addressed key questions such as the essential steps involved in the curriculum development process in medical education, the desired outcomes of effective curriculum development, the impact of different educational strategies on achieving learning goals, the assessment tools used to evaluate the effectiveness of medical curricula, and the methods of curriculum implementation and evaluation in medical education settings.

A comprehensive search strategy was developed to identify relevant literature. Keywords and phrases such as "curriculum development," "medical education," "learning outcomes," "educational strategies," "assessment tools," "curriculum implementation," and "curriculum evaluation" were used. Boolean operators (AND, OR) were employed to combine search terms, ensuring a broad yet focused retrieval of articles. The search spanned multiple electronic databases, including PubMed, MEDLINE, ERIC (Education Resources Information Center), Scopus, Web of Science, and Google Scholar.

Inclusion criteria for the review encompassed articles published in peer-reviewed journals that provided empirical evidence or comprehensive reviews on curriculum development in medical education. Studies needed to address one or more aspects of the curriculum development process, such as content identification, learning goals and outcomes, educational strategies, assessment tools, implementation, and evaluation. Exclusion criteria included non-peer-reviewed articles, opinion pieces, editorials, and studies not directly related to medical education or curriculum development.

The appraisal and synthesis of the literature involved a systematic evaluation of the quality and relevance of the selected articles. Each study was assessed for its methodological rigor, clarity of findings, and contribution to understanding curriculum development in medical education. The synthesis was narrative, drawing connections between studies to highlight common themes, best practices, and areas for further research. This method allowed for a comprehensive overview of the current state of knowledge in curriculum development, providing insights into effective strategies and outcomes that can inform future educational initiatives.

RESULTS

The review on curriculum development in medical education highlights several key findings. Eisner (1985) identifies three types of curricula: explicit, implicit, and null. The explicit curriculum is structured and publicly available, with clearly framed learning objectives, while the implicit curriculum is influenced by geographical, political, and socioeconomic contexts, considering traditions, religious sentiments, and political scenarios. The null curriculum refers to aspects that are not taught despite being planned, highlighting inevitable gaps in coverage. The curriculum development process begins with a needs assessment focused on current medical knowledge, community needs, and learner resources, using both readily available and new data.

Table 1: Key Elements of Curriculum Development and Evaluation in Education

Aspect	Key Findings
Types of Curriculum	- **Explicit Curriculum:** Structured, publicly available, with clearly framed learning objectives (4, 6, 7).
	- **Implicit Curriculum:** Influenced by geographical, political, and socioeconomic contexts, considering traditions, religious sentiments, and political scenarios (4, 6, 7).
	- **Null Curriculum:** Aspects not taught despite being planned, highlighting inevitable gaps in curriculum coverage (4, 6, 7).
Needs Assessment	Focused attention on current medical knowledge, community needs, and learner resources. Uses readily available information and new data to guide curriculum development.
Content Determination	Begins with a general description followed by prioritization. Utilizes various sources to ensure essential topics are addressed. Example: Qualitative analysis to include themes like racism (8).
Goals and Objectives	- **Goals:** Broad overview of content to be covered.
	- **Objectives:** Specific, measurable statements of knowledge, skills, and attitudes to be attained by learners. Challenging to write but crucial for clear, specific, and measurable outcomes.
Educational Strategies	- **Lecture-based Information:** Basic understanding, less favorable for active learning.
	- **Hands-on Skill Delivery:** Practical application, requires adequate equipment and space.
	- **Flipped Classroom Approach:** Promotes active learning, requires pre-work such as reading materials.
	- **Case-Based Learning:** Promotes active and shared learning experiences.
Curriculum Implementation	Effective implementation involves applying educational activities to achieve knowledge, skills, and attitudes. Identifies strengths, weaknesses, and areas for improvement. (9; 10; 11; 12; 13; 14; 15).
Curriculum Evaluation	- **Formative Evaluation:** Conducted early and throughout to inform changes for improvement.
	- **Summative Evaluation:** Conducted at the end to assess outcomes and report to stakeholders.
	Regular evaluation is crucial for continuous improvement and to ensure the curriculum meets evolving needs.

Determining and prioritizing content follows, starting with a general description and prioritizing essential topics through various sources, such as the inclusion of themes like racism identified through qualitative analysis. Writing goals and objectives is critical, with goals providing a broad overview and objectives offering specific, measurable statements of knowledge, skills, and attitudes to be attained by learners. Selecting educational strategies involves aligning methods with learning outcomes, considering both learners and teachers, and using approaches like lecture-based information for basic understanding, hands-on skill delivery for practical application, flipped classroom for active learning, and case-based learning for shared experiences. Curriculum implementation applies designed activities to achieve intended knowledge, skills, and attitudes, identifying strengths, weaknesses, and areas for improvement. Curriculum evaluation includes formative evaluation conducted early and throughout to inform changes, and summative evaluation at the end to assess outcomes and report to stakeholders, ensuring continuous improvement and alignment with evolving needs.

DISCUSSION

The review of curriculum development in medical education revealed several crucial findings, aligning with and expanding upon previous research. Eisner's (1985) identification of three types of curricula—explicit, implicit, and null—provided a comprehensive framework for understanding the multifaceted nature of educational planning. The explicit curriculum, characterized by its structured, publicly available design with clearly framed learning objectives, was found to be essential for guiding educational efforts at local, national, and universal levels (4, 6, 7). In contrast, the implicit curriculum, shaped by geographical, political, and socioeconomic contexts, emphasized the importance of considering traditions, religious sentiments, and political scenarios in curriculum development (4, 6, 7). The concept of the null curriculum, highlighting the inevitable gaps in coverage despite careful planning, underscored the need for continuous curriculum evaluation and adaptation (4, 6, 7).

The process of curriculum development began with a thorough needs assessment, focused on current medical knowledge, community needs, and learner resources. This step, which utilized both readily available and newly collected data, ensured that the curriculum addressed relevant and timely issues. Determining and prioritizing content was crucial, starting with a general description followed by a structured prioritization process. Previous studies, such as 8's qualitative analysis on racism in medical education, demonstrated the value of identifying and integrating key themes to ensure comprehensive coverage (8).

Writing goals and objectives proved to be a fundamental aspect of curriculum development. Goals provided a broad overview of the content to be covered, while objectives offered specific, measurable statements of the knowledge, skills, and attitudes learners should attain. This distinction, although challenging to articulate, was critical for ensuring that both learners and instructors had clear, specific, and measurable targets.

Selecting educational strategies was also essential for the curriculum's success. The review found that aligning teaching methods with learning outcomes—considering both the learners and the content—was paramount. Strategies varied depending on the objectives, ranging from lecture-based information for basic understanding to hands-on skill delivery for practical application, flipped classroom approaches for active learning, and case-based learning for shared learning experiences.

The implementation phase involved applying the designed educational activities to achieve the intended knowledge, skills, and attitudes. This phase also served as an opportunity to identify strengths, weaknesses, and areas for improvement, aligning with previous research that emphasized the importance of continuous curriculum evaluation (9-15).

Curriculum evaluation, both formative and summative, was highlighted as a critical component. Formative evaluation, conducted early and throughout the program, informed necessary changes for improvement, while summative evaluation assessed outcomes at the end of the process. This cyclical evaluation process was essential for ensuring that the curriculum remained relevant and effective, supporting continuous improvement and alignment with evolving educational and societal needs.

Despite these comprehensive findings, the review identified several strengths, weaknesses, and limitations. The structured and systematic approach to curriculum development ensured thorough coverage of essential topics and alignment with educational goals. However, the implicit and null curricula highlighted the challenges of addressing all relevant issues within a single curriculum, emphasizing the need for continuous adaptation and evaluation. Additionally, while the review utilized a broad range of sources and methodologies, the inherent variability in educational contexts and resources presented limitations in the generalizability of findings (17-19).

Recommendations for future curriculum development include a continued emphasis on needs assessment, the integration of diverse educational strategies, and a robust evaluation framework. Ensuring that curricula are responsive to changing societal and educational demands will require ongoing collaboration among educators, learners, and stakeholders. Furthermore, addressing the gaps identified in the null curriculum and considering the implicit curriculum's contextual influences will be essential for creating comprehensive and effective educational programs. The dynamic nature of medical education necessitates a flexible and adaptive approach to curriculum development, ensuring that it remains relevant and impactful in preparing future healthcare professionals (19, 20).

CONCLUSION

In conclusion, the systematic approach to curriculum development in medical education, encompassing needs assessment, content prioritization, goal setting, educational strategies, implementation, and continuous evaluation, ensures the creation of comprehensive and adaptive educational programs. This process addresses the diverse and evolving needs of learners and society, ultimately enhancing the quality of medical education. The implications for human healthcare are significant, as well-developed curricula prepare future healthcare professionals with the knowledge, skills, and attitudes necessary to deliver high-quality patient care, adapt to changing healthcare environments, and address emerging health challenges effectively.

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