Competency-Based Medical Education in Pediatric Surgery: The Role of Simulation and Entrusted Clinical Tasks

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Abstract

In the process of modernizing medical education, the competency-based approach has become the leading principle in specialist training [1, 2]. However, even with a high level of theoretical knowledge, graduates are not always prepared for independent practice in real clinical settings. This issue is particularly pronounced in high-risk fields such as pediatric surgery, which require rapid and well-reasoned responses [3, 4]. Consequently, educational processes must shift the focus from the formal volume of knowledge to the assessment of students' readiness to perform practical tasks [5].

1. Introduction

Professional competence is understood as an integrative characteristic of a specialist, encompassing a combination of knowledge and skills, clinical reasoning, readiness for practical activity, professional responsibility, and the capacity for reflective analysis of one's own performance [1, 2, 6]. The development of these aspects constitutes the primary goal of modern medical education and requires appropriate methodological support [7, 8].

2. Materials and Methods

The developed methodology is based on the integration of theoretical material with practical clinical assignments aligned with the students' level of training [2, 9]. The educational process is organized through problem-oriented cases and simulation-based training [5, 10]. Tasks are formulated clearly and accessibly, including, for example, the assessment of a child's general condition, formulation of a preliminary diagnosis, and interpretation of instrumental investigation results. The instructor functions as a mentor, organizing the educational process and progressively increasing task complexity as the student's competence develops [6, 11].

Students act as active participants in the learning process. Instruction is structured in sequential stages: the motivational-orienting stage fosters interest and engagement; the cognitive-analytical stage ensures deep understanding of theory; the practical-activity stage facilitates the application of knowledge to clinical problem-solving; and the reflective-evaluative stage promotes self-assessment of actions and outcomes [7, 12]. This staged approach ensures continuous and targeted professional development.

A key component of the methodology is interdisciplinary integration. Pediatric surgery is linked with pediatrics, diagnostics, and pathophysiology, enabling students to develop a comprehensive approach to clinical situations and to apply acquired knowledge across multiple areas of practice [6,13].

The core content of the methodology encompasses an integrated set of relevant knowledge and skills. The curriculum includes angiosurgery, transplantology, plastic and aesthetic surgery, as well as minimally invasive and high-tech operative methods [3, 11]. Special emphasis is placed on the early diagnosis and effective treatment of the most common surgical conditions in children, such as acute thoracic and abdominal surgical diseases. Additionally, students acquire skills in using instrumental diagnostic methods, including ultrasonography, radiography, thoracoscopy, and endoscopy [10, 11].

3. Results and Discussion

Implementation of EBCT technology in pediatric surgery education demonstrated high effectiveness in developing students' clinical reasoning [5, 9]. Performing entrusted clinical tasks fosters an understanding of the relationship between decision-making, actions taken, and outcomes achieved, enhancing the practical significance of theoretical knowledge and stimulating the development of pragmatically oriented professional thinking [6, 12]. Assessment of learning outcomes is based not on quantitative measures but on the quality and safety of completed tasks, cultivating a sense of high responsibility for the results of one's work [1, 2].

The methodology also activates students' reflective activity. After completing clinical tasks, learners analyze their actions, identify errors and achievements, and adjust their professional development plans accordingly [7, 12]. Integration of the educational process with real clinical practice, along with a modular program structure, ensures systematic knowledge acquisition and its transferability to practical activity [6, 11]. Interdisciplinary clinical cases develop students' ability to conduct comprehensive analysis of clinical situations [13].

Pragmatically oriented training, based on problem-solving, clinical cases, and interactive sessions, promotes analytical thinking and directs students toward achieving specific outcomes [5, 14]. This approach cultivates the ability to adapt theoretical knowledge to real-world conditions and apply it to practical problem-solving, thereby fostering professional qualities such as evidence-based reasoning and responsible decision-making [1, 6].

4. Conclusion

The described methodology, based on EBCT technology, constitutes a coherent pedagogical system aimed at developing the professional competence of future physicians. Integration of theoretical training with practical activity, emphasis on trust in the student, and gradual enhancement of independent decision-making foster effective development of clinical reasoning, practical skills, and responsibility [1, 2, 5]. The presented model aligns with contemporary healthcare system requirements for training qualified specialists capable of independent clinical decision-making [1, 15].

Conflict of Interests
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