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Problems and Solutions in the Training of Pediatric Clinical Skills for Undergraduate Medical Students

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Abstract: Undergraduate students majoring in clinical medicine are one of the important reserve forces of clinical doctors in China, and their pediatric clinical skills are directly related to their future clinical practice quality and the diagnosis and treatment safety of children. At present, there are still some deficiencies in the training of pediatric clinical skills for undergraduate medical students, which restrict the effect of skill training and are difficult to meet the needs of pediatric clinical diagnosis and treatment positions. Focusing on four dimensions—teaching model, teaching resources, student learning, and assessment and incentive—this paper analyzes the existing problems in the training of pediatric clinical skills for undergraduate medical students and puts forward targeted solutions, aiming to provide references for optimizing the pediatric clinical skill training system and improving the pediatric clinical practice ability of undergraduate medical students.

Keywords: Undergraduate medical students; Pediatrics; Clinical skill training; Problems; Solutions

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1. Introduction

In recent years, the supply of children's medical resources and service level in China have been continuously improved. According to data from the National Health Commission, although the number of pediatricians nationwide has increased from 110,000 in 2015 to 205,800 in 2024, a growth of 74.4%, there is still a large talent gap. With the growth of people's demand for pediatric medical services, it has become particularly important to cultivate the pediatric clinical skills of undergraduate medical students. Pediatric work is characterized by difficulty in examination, communication, and diagnosis. Unlike adults, children, especially infants, are prone to crying when ill and cannot clearly describe their symptoms in words. In addition, many indicators and medications are different from those for adults, which put forward higher requirements for doctors' communication skills, clinical thinking, and clinical skills. Existing studies have carried out a lot of explorations around the training of pediatric clinical skills, integrating Problem-Based Learning (PBL),

Case-Based Learning (CBL), SOAP medical record analysis method, Mini-Clinical Evaluation Exercise (Mini-CEX), formative evaluation, etc., into the training system, providing references for the training of pediatric clinical skills [1–4]. Therefore, in-depth analysis of the problems in the training of pediatric clinical skills for undergraduate medical students and the formulation of targeted solutions are of great significance for improving the clinical practice ability of medical students, expanding the team of pediatric talents, and alleviating the contradiction between supply and demand of children's medical services.

2. Existing problems in the training of pediatric clinical skills for undergraduate medical students

Based on the results of literature research and clinical teaching surveys, the problems in the training of pediatric clinical skills for undergraduate medical students are mainly concentrated in four aspects: teaching model, teaching resources, student learning, and assessment and incentive.

2.1. Outdated teaching model and insufficient interactive practice

At present, some pediatric clinical teaching still adopts the traditional model [5]. During the training process, due to the heavy clinical work and limited teaching time of teachers, it is difficult for them to spend a lot of energy innovating the teaching model. About 78.3% of pediatric clinical skill teaching is mainly based on "lecture + demonstration". In clinical practice, teachers are usually in the state of lecturing or demonstrating the whole time, failing to create sufficient interactive and practical opportunities, resulting in low learning interest of students [6].

2.2. Shortage of teaching resources and improper case selection

The supply of pediatric clinical teaching resources is insufficient. On the one hand, affected by factors such as children's young age, low cooperation degree, and parents' anxiety, pediatric clinical practice resources are scarce, and about 62.7% of students find it difficult to obtain clinical practical operation opportunities [7]. On the other hand, some teachers focus on theoretical knowledge, fail to select clinical cases reasonably, and their explanations are not detailed and thorough enough, which limits the effect of students' clinical skill improvement [1,8].

2.3. Low student initiative and weak basic knowledge

Some undergraduate medical students do not attach importance to the learning of pediatric clinical skills. In clinical practice, some students have a sense of difficulty and rely too much on teachers. About 41.8% of students only observe the operation of senior physicians without practicing themselves, leading to frequent problems in independent operations [5,9]. At the same time, students' mastery of pediatric knowledge is not solid. Pediatric diseases are mostly concurrent, and various problems will be encountered in clinical work. However, about 68.5% of students have a vague impression of knowledge, unclear diagnostic ideas for common pediatric diseases and symptoms, and it is difficult for them to accurately observe and diagnose diseases [10,11].

2.4. Insufficient assessment and incentive, low proportion of practical investigation

The assessment and incentive mechanism are not perfect, making it difficult to play a guiding role. In terms

of assessment content, theoretical written tests and standardized assessment of skill operations account for a high proportion, and only 27.4% of the assessment involves clinical practice application, emergency disposal, and communication skills [4,12]. The incentive mechanism is lacking, and there are few clear rewards for students with excellent skills. About 64.3% of students with weak skills do not receive targeted help. The assessment results have little correlation with students' evaluation of excellence and employment, making it difficult to mobilize learning enthusiasm [9].

3. Solutions to the problems in the training of pediatric clinical skills for undergraduate medical students

Adhering to the principle of "problem-oriented and precise policy implementation", the following solutions are proposed for the above problems:

3.1. Innovate teaching models and break the limitations of traditional lecture-demonstration combination

Based on the characteristics of pediatric clinical skill training, introduce a variety of advanced teaching methods, promote the innovation of teaching models, and realize the deep integration of theory and practice, teaching and clinical practice.

(1) Promote the blended teaching model and enrich teaching methods

Construct a "CBL-PBL-Seminar" blended teaching model, combining Case-Based Learning (CBL), Problem-Based Learning (PBL), and Seminar teaching [8]. Taking clinical practical cases as the carrier, put forward pediatric diagnosis and treatment-related problems, guide students to think actively, discuss in groups, and independently explore solutions to cultivate clinical thinking and teamwork ability. At the same time, combine situational teaching method to simulate common clinical scenarios such as children with febrile convulsions and crying, allowing students to participate in the diagnosis and treatment process immersively and improve emergency disposal ability [1].

(2) Promote the deep integration of theory and practice and strengthen practical teaching

Adjust the teaching arrangement, increase the proportion of clinical practice class hours, and carry out theoretical teaching and clinical practice simultaneously [13]. When teaching pediatric physical examination and other skills, combine clinical internship cases to allow students to directly operate on children under the guidance of teachers, realizing the transformation of theoretical knowledge into practical ability [14]. Introduce the cross-integration model of SOAP medical record analysis method and Mini-CEX, allowing students to analyze cases according to the process of "Subjective data–Objective data–Assessment–Plan", and improve clinical skills and diagnostic thinking simultaneously through Mini-Clinical Evaluation Exercise [3].

(3) Strengthen interactive teaching and personalized guidance

Adopt the group teaching model to increase interaction opportunities between teachers and students, and among students, encouraging students to ask questions actively and try operations boldly [6]. According to students' mastery of skills, teachers use online platforms to push case resources and teaching videos, carry out personalized teaching, focus on guiding students with weak foundations, and put forward higher requirements for students with excellent skills to meet their needs for review and consolidation and independent improvement, making up for the deficiencies of classroom teaching [8].

3.2. Improve teaching resources and strengthen the connection with clinical practice cases

Focus on the root causes of problems, optimize from three dimensions: technology empowerment, case construction, and teacher support, and effectively solve the problems of insufficient practical opportunities and unsystematic skill learning for students.

(1) Virtual technology empowerment and simulated practice

Increase the application of virtual simulation education, introduce standardized child patient models to simulate the physical structure, pathological function, pathological manifestations and evolution of children, allowing students to practice repeatedly in a simulated environment to improve clinical skills [4]. Continuously introduce virtual standardized child patients with different degrees and conditions, expand the coverage of cases, and ensure that simulated training is in line with clinical reality.

(2) Cross-hospital resource integration and joint construction of case databases

Relying on big data and artificial intelligence technology, cooperate with pediatric departments of other hospitals in the region to co-construct and share the "intelligent clinical teaching case database of pediatrics", break down data barriers among hospitals, dynamically integrate the latest pediatric clinical cases, and build a quality review system of intelligent preliminary review + expert re-examination to ensure that the case quality meets the standards. Driven by data, a large number of clinical resources are updated in real time and transformed and applied in clinical teaching scenarios, facilitating students to practice operational skills and key points in combination with cases [8].

(3) Optimize teacher management and improve teaching quality

Regularly carry out teaching training and seminars, formulate systematic training plans, discuss case selection directions, enrich case types, and improve teaching guidance ability [6]. Establish an assessment mechanism, link teaching quality and teaching integrity with professional title promotion and evaluation of excellence, encourage teachers to communicate with students, collect demands and opinions, and continuously improve teaching methods [9].

3.3. Strengthen student guidance and improve learning initiative and clinical operation thinking

In view of students' low initiative, weak basic knowledge, and insufficient disease diagnosis ability, strengthen guidance and training to stimulate learning motivation and improve clinical thinking and diagnosis ability.

(1) Strengthen ideological guidance and stimulate learning initiative

Carry out professional quality education in pediatric medicine, let students realize the importance of pediatric clinical skills, establish a patient-centered professional philosophy, and reduce the sense of difficulty [5,9]. Combine typical pediatric clinical cases to let students understand the responsibilities and missions of pediatricians, stimulate learning interest, and establish study groups to encourage students to explain basic theoretical knowledge to each other, creating a good learning atmosphere [10].

(2) Strengthen disease diagnosis and treatment training and improve diagnosis ability

Increase the teaching of diagnosis and treatment standards for common and frequently occurring pediatric diseases, allowing students to proficiently master the symptoms, signs, diagnostic standards, and treatment principles of common diseases [9,10]. Through simulated diagnosis and treatment, case discussions, and other methods, let students practice the process of disease judgment and diagnosis

repeatedly to improve observation ability and accuracy; implement the SP combined with CBL model, where standardized patients simulate children's symptoms, allowing students to complete consultation, inquiry, physical examination, and diagnosis, and improve clinical diagnosis ability and communication ability simultaneously [15].

(3) Strengthen the cultivation of clinical thinking and improve practical ability

Pay attention to the cultivation of clinical thinking in skill teaching, guide students to combine skill operations with children's conditions and physiological characteristics. For example, in intravenous puncture training, guide students to select appropriate puncture sites and methods according to children's age, vascular conditions, and disease status [10,11]. Introduce evidence-based medicine teaching method to guide students to analyze diagnosis and treatment plans in combination with clinical evidence, improving the scientificity of clinical thinking [11].

3.4. Optimize the assessment and incentive mechanism and strengthen the investigation of clinical practice application ability

In view of the insufficient assessment and incentive and the neglect of the investigation of clinical practice application ability, optimize the assessment content and methods, improve the incentive mechanism, and give play to the guiding role of assessment.

(1) Optimize assessment content and highlight clinical practice application ability

Adjust the assessment content, reduce the proportion of theoretical written tests, and increase the proportion of assessment of clinical practice application, emergency disposal, and communication skills [4,12]. The assessment content is closely combined with clinical reality, selecting common clinical skill operations and case diagnosis as key points, such as adding emergency disposal of children with febrile convulsions, intravenous puncture operation, and case diagnosis, to ensure that the assessment can truly reflect students' clinical skill level [3].

(2) Innovate assessment methods and improve process-oriented assessment

Establish a model combining process-oriented assessment and summative assessment [3,4]. Process-oriented assessment runs through the entire internship period, covering skill training performance, case analysis ability, and teachers' evaluation, conducting regular assessments to timely find deficiencies and provide targeted guidance; summative assessment adopts practical operation assessment and case defense to comprehensively investigate comprehensive clinical skills; refine assessment evaluation standards to reduce subjective arbitrariness and ensure fair and objective assessment [12].

(3) Improve the incentive mechanism and mobilize learning enthusiasm

Establish and improve the incentive mechanism, give commendations and rewards to students with excellent skills, link assessment results with evaluation of excellence and employment recommendation, and stimulate learning motivation [9]. Formulate personalized assistance plans for students with weak skills, with key guidance from teachers, encouragement and support to enhance learning confidence. Establish a pediatric clinical skill competition mechanism to promote learning and practice through competitions, and comprehensively improve students' clinical skill level [4].

4. Conclusion

In summary, strengthening the training of pediatric clinical skills for undergraduate medical students is

crucial to enhancing students' comprehensive abilities and post competency, and improving the level of pediatric medical services. Therefore, great attention should be paid to focusing on the problems in the training of pediatric clinical skills for undergraduate medical students and forming reasonable solutions targeting the root causes of the problems. Solve the problem of outdated teaching models by innovating blended teaching models and promoting the integration of theory and practice; solve the problem of shortage of teaching resources by introducing advanced technologies, enriching case resources, and strengthening teacher training; solve the problem of students' insufficient initiative and ability by strengthening ideological guidance, cultivating clinical thinking, and enhancing diagnosis training; solve the problem of insufficient assessment and incentive by optimizing assessment content, innovating assessment methods, and improving the incentive mechanism. In the future, teachers should actively introduce advanced methods and technologies into clinical teaching, further stimulate students' learning interest, fully cultivate their clinical practice ability, and promote the high-quality development of clinical education.

Disclosure statement

The author declares no conflict of interest.

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