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Research on the Application of the "New Medical Science" Background in Clinical Teaching for Visually Impaired Students

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Abstract: With the advancement of technology and society, the construction of "New Medical Science" has emerged, breaking through traditional medical education models and emphasizing the deep integration of medicine with multiple disciplines. This integration injects new vitality into medical education and aids in cultivating interdisciplinary talents. The "New Medical Science" construction has a comprehensive impact on medical education, bringing about changes in training objectives, teaching methods, and curriculum design. Clinical teaching for visually impaired students, as an important part of medical education, faces numerous challenges. Due to their visual impairments, they are limited in clinical skill learning and interpersonal communication. Additionally, the existing teaching models lack specificity and flexibility, and teaching resources are relatively scarce. The "New Medical Science" background brings new influences to clinical teaching for visually impaired students, promoting the integration and innovation of teaching resources, emphasizing humanistic care and psychological support, and facilitating the diversification and personalization of teaching methods. Based on this, reform strategies are proposed: integrating teaching resources and innovating auxiliary teaching tools; innovating teaching methods and focusing on the cultivation of practical operational skills; strengthening humanistic care and psychological support; and constructing a diversified evaluation system. By implementing these measures, the quality of clinical teaching for visually impaired students can be effectively improved, cultivating medical talents with both solid clinical skills and good humanistic qualities. In the future, clinical teaching for visually impaired students holds broad prospects, and we look forward to providing them with more high-quality and efficient medical education services through continuous exploration and practice.

1. Introduction

As time advances, the medical field is experiencing unprecedented transformations, necessitating

that medical education, a pivotal element in cultivating medical talents, align its development models and concepts with the times to better fulfill the society's diverse and high - level demands for medical professionals. [1]In this context, the construction of "New Medical Science" has emerged, bearing the mission of medical education innovation and presenting new opportunities and challenges for the development of special groups like visually impaired students in the medical realm. The current technological and societal developments have spurred reforms in medical education, giving rise to "New Medical Science," which breaks through traditional medical education models and emphasizes the deep integration of medicine with multiple disciplines.[2] For instance, the combination of medicine and engineering leads to biomedical engineering and the development of advanced medical equipment, while integration with information science advances medical informatization and intelligence, as seen in telemedicine and AI - assisted diagnosis. Interdisciplinary interactions with humanities and social sciences enhance doctors' humanistic care. This integration injects new vitality into medical education and helps cultivate interdisciplinary talents suited for future medical development.[3-6]

The "New Medical Science" construction has a far-reaching impact on medical education. In terms of training objectives, it shifts from merely focusing on medical professionals to emphasizing students' comprehensive qualities and innovative abilities, including communication, teamwork, critical thinking, and autonomous learning, encouraging students to apply interdisciplinary knowledge to solve medical problems and engage in innovative practices.[7] In teaching methods, it adopts diverse approaches like problem - based learning, case teaching, and simulation teaching to stimulate students' initiative. In curriculum design, it increases the proportion of interdisciplinary courses and practical teaching to broaden students' horizons. Clinical teaching for visually impaired students is a vital part of medical education, reflecting humanistic care and social responsibility.[8] However, due to their visual impairments, they encounter numerous difficulties in clinical learning, such as lacking intuitive visual information when observing patients' symptoms and signs or operating medical equipment, struggling to accurately control force, angle, and techniques in practical operations, and having trouble accessing and understanding visual - information - dominated teaching materials during theoretical learning.[9] Optimizing their clinical teaching under the "New Medical Science" framework to enhance their clinical skills and humanistic qualities is an urgent issue concerning educational equity and social inclusion.

2. Analysis of the Current Situation of Clinical Teaching for Visually Impaired Students

2.1 Particularities of Clinical Teaching for Visually Impaired Students

2.1.1 Limited Clinical Skill Learning

Vision is crucial for clinical observation. Visually impaired students cannot directly observe patients' facial expressions, gaits, and other signs, affecting the construction of disease diagnosis thinking. In operations such as venipuncture and surgical suturing, they lack visual feedback and find it difficult to grasp the force, angle, and depth of operations, increasing the difficulty and risk. For instance, during intravenous catheterization, visually impaired students are unable to visually assess the location, course, and fullness of blood vessels. The lack of visual feedback makes it difficult for them to accurately control the force, angle, and depth of the puncture, thereby increasing the difficulty and risk of the procedure, which may lead to failed punctures or patient discomfort. Similarly, in surgical suturing, visually impaired students struggle to observe the direction of the suture thread, the uniformity of stitch spacing, and the approximation of the wound edges, which similarly affects the quality and effectiveness of the suturing.

In addition, visually impaired students face significant challenges when observing gross

specimens and tissue sections while studying pathology courses. Pathology, as a discipline that studies the laws of disease occurrence and development, includes a vast amount of knowledge that needs to be learned through microscopic observation of tissue sections. However, visually impaired students are unable to directly observe these sections and can only rely on descriptions from others or touch alternative models to obtain information. This undoubtedly increases the difficulty for them to understand and master pathological knowledge.

2.1.2 Obstacles in Interpersonal Communication

Visually impaired students struggle to understand patients' emotional needs through non-verbal information such as facial expressions and eye contact, affecting communication effectiveness. In healthcare teamwork, they cannot participate in efficient communication through eye contact and gestures, leading to delayed and inaccurate information transmission and affecting team efficiency. For example, in emergency rescue situations, rapid communication and coordination among team members are of utmost importance. However, visually impaired students may delay the treatment timing due to their inability to promptly access crucial information. Additionally, when participating in activities such as case discussions and academic exchanges, visually impaired students might feel isolated and helpless because they cannot directly observe visual information like presentation slides and video materials. This further restricts their academic development and career growth.

2.2 Inadequacies of Existing Teaching Models

2.2.1 Lack of Specificity and Flexibility

Traditional teaching mainly relies on teacher lectures without fully considering the special needs of visually impaired students. It often relies on visual materials for explanation, which is difficult for visually impaired students to understand. Moreover, the model is fixed and difficult to adjust according to visually impaired students' learning progress and feedback, failing to stimulate their learning interest and initiative. Teachers often deliver lessons according to the predetermined teaching plan and schedule, overlooking the special challenges and needs that visually impaired students may encounter during the learning process. This "one-size-fits-all" teaching approach fails to stimulate the interest and initiative of visually impaired students; instead, it may lead to feelings of frustration and aversion to learning.

2.2.2 Scarcity of Teaching Resources

There are few auxiliary tools suitable for visually impaired students, such as medical models and simulation operation devices, lacking intuitive learning and practical operation pathways. The number of accessible clinical teaching platforms specially designed for visually impaired students is small, and their functions are imperfect, unable to meet their learning needs. These platforms often lack special functional designs tailored for visually impaired students, such as voice navigation and tactile feedback, and thus fail to meet their learning needs. Additionally, due to technological constraints and cost considerations, the updates and maintenance of these platforms often lag behind the evolving demands of practical teaching. The scarcity of teaching resources not only restricts the learning outcomes and career prospects of visually impaired students but also highlights the current deficiencies in inclusivity and diversity within medical education. To address this situation, it is necessary to increase investment and research and development efforts in teaching resources for visually impaired students, thereby promoting medical education towards a more inclusive and diverse direction.

3. Influence of the "New Medical Science" Background on Clinical Teaching for Visually Impaired Students

3.1 Promoting the Integration and Innovation of Teaching Resources

Under the "New Medical Science" background, medical education emphasizes the integration and innovation of resources. For clinical teaching of visually impaired students, this means fully utilizing modern information technology to develop auxiliary teaching tools and platforms suitable for them, such as tactile graphic displays and intelligent aids, to compensate for the inconvenience caused by their visual impairments. Meanwhile, by integrating online and offline teaching resources, more diverse learning pathways are provided for visually impaired students.

3.2 Emphasizing Humanistic Care and Psychological Support

The "New Medical Science" focuses on cultivating medical humanistic spirit and emphasizes that doctors should possess the ability of humanistic care and psychological support. For visually impaired students, due to facing more challenges in learning and life, they need more care and support from teachers and classmates. Therefore, under the "New Medical Science" background, clinical teaching for visually impaired students should pay more attention to humanistic care and psychological support to help them build confidence and overcome learning obstacles.

3.3 Facilitating the Diversification and Personalization of Teaching Methods

Under the "New Medical Science" background, the diversification and personalization of teaching methods have become a trend. For clinical teaching of visually impaired students, this means adopting diverse teaching methods according to their special needs and learning abilities, such as case teaching, simulation teaching, and group cooperative learning, to stimulate their learning interest and initiative. Meanwhile, attention should be paid to personalized teaching, formulating personalized teaching plans and counseling programs according to the characteristics and needs of different visually impaired students.

4. Reform Strategies for Clinical Teaching of Visually Impaired Students under the "New Medical Science" Background

4.1 Integrating Teaching Resources and Innovating Auxiliary Teaching Tools

Teachers should develop auxiliary teaching tools and platforms suitable for visually impaired students based on the characteristics of their visual impairments. For example, instructors can utilize tactile graphics displays to showcase human anatomical structures, pathological features, and so on, helping visually impaired students understand medical knowledge through tactile perception. Meanwhile, schools and hospitals can integrate online and offline teaching resources to provide visually impaired students with various learning channels such as video tutorials, audio explanations, and online tests, meeting their diverse learning needs.

4.2 Innovating Teaching Methods and Focusing on Practical Operations

Instructors should adopt a variety of teaching methods and focus on cultivating practical operational abilities. For instance, clinical teachers can enhance the clinical skills of visually impaired students by allowing them to perform practical operations in simulated clinical environments through simulation-based teaching. At the same time, instructors should introduce a

cooperative learning model in groups, encouraging visually impaired students to learn from and assist each other, and jointly solve problems encountered during learning. In addition, experienced doctors can be invited to provide on-site guidance, offering real clinical cases and operational experiences for visually impaired students.

4.3 Strengthening Humanistic Care and Psychological Support

Instructors should pay attention to humanistic care and psychological support, helping visually impaired students build self-confidence and overcome learning obstacles. Teachers can understand the learning and living conditions of visually impaired students through regular talks and psychological counseling and provide timely care and support. Meanwhile, schools should organize visually impaired students to participate in various club activities and volunteer services to enhance their social interaction and teamwork abilities. Furthermore, successful visually impaired individuals can be invited to share their experiences to inspire visually impaired students to actively face challenges and strive to realize their self-worth.

4.4 Constructing a Diversified Evaluation System

Teachers should construct a diversified evaluation system to comprehensively assess the learning achievements of visually impaired students. In addition to traditional theoretical examinations, practical operation assessments, group cooperative learning evaluations, and humanistic quality evaluations should also be included. Through a diversified evaluation system, a more comprehensive understanding of the learning status and ability levels of visually impaired students can be achieved, providing them with more targeted feedback and guidance.

5. Conclusion

The background of "New Medical Science" brings both challenges and opportunities to the clinical teaching of visually impaired students. Facing the special difficulties they encounter in learning clinical skills and interpersonal communication, as well as the shortcomings of the existing teaching models, the construction of "New Medical Science" integrates teaching resources, innovates teaching methods, strengthens humanistic care and psychological support, and establishes a diversified evaluation system, injecting vitality into the teaching.[7]These measures can enhance the quality of teaching and cultivate medical talents with both clinical skills and humanistic qualities. Specifically, the integration and innovation of teaching resources compensate for the lack of visual observation among visually impaired students. Diversified teaching methods stimulate their learning interest and improve their abilities. Enhanced humanistic care creates an inclusive learning environment, and a diversified evaluation system ensures comprehensive and objective assessment. Looking ahead, with the advancement of "New Medical Science" construction and the reform of medical education, the prospects for the clinical teaching of visually impaired students are broad. We anticipate further optimizing teaching, innovating methods, and improving evaluation systems. Meanwhile, we also call on society to pay attention and promote inclusive and diverse development in medical education, contributing to the cultivation of medical talents.

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