

Discussion on the Teaching Methods of Ophthalmology Training for General Practitioners in Tertiary General Hospitals

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Abstract: General medicine is an emerging secondary clinical discipline that aims to serve the society and family health management, and it plays a key role in hierarchical diagnosis and treatment. General practitioners are the leading providers of primary medical services and are responsible for comprehensive work such as diagnosis, treatment, preventive care, health record management, and referral of common and frequently-occurring diseases. They play an essential role in the health care system, providing comprehensive medical services to communities and families to improve people's overall health. Developing and promoting general medicine are significant to establishing a sound medical and healthcare system, and improving primary medical services. Therefore, general practitioners require a broader range of knowledge than specialists, and the training model also differs from that of specialists. Given the short training time and heavy teaching tasks for ophthalmology, this article will combine the professional characteristics of ophthalmology to explore the application of appropriate teaching methods in a short period in order to achieve exemplary teaching results. In this process, it is necessary to comprehensively consider the professional characteristics of ophthalmology and the limitations of general practitioner training time, and discover appropriate teaching methods to improve the teaching effect and ensure the all-round development of students.

Keywords: Ophthalmology; Teaching; Training; General medicine

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1. Introduction

General medicine is a secondary clinical discipline that aims to focus on the individual, and strive to maintain and improve health^[1]. This field is in the stage of development and exploration. It aims to cultivate comprehensive clinical medicine talents engaged in disease prevention, health care, treatment and diagnosis, community rehabilitation, and health education. During college or university training, general medicine students must learn basic concepts, theories, skills, and knowledge about multi-dimensional disciplines such as general medicine, clinical medicine, and preventive medicine. After general practitioners complete their

college or university education, they can diagnose and treat common and frequently-occurring diseases in primary hospitals, and provide continuous medical services such as preventive care and chronic disease management ^[2]. They play an indispensable and vital role in China's medical and health team. As people's quality of life and standards improve, the demand for medical care is also increasing, and the importance of general practitioners has become increasingly prominent. Ophthalmology is the secondary clinical discipline of preventing, diagnosing, and treating visual organ diseases, and the common diseases include external eye diseases, glaucoma, cataracts, refractive errors, etc. ^[3]. The eyes are an essential part of the body. Once a disease of the visual organ occurs, it may cause blurred vision in mild cases or blindness in severe cases, which will have serious consequences for people's life ^[4]. In addition, diseases of the eyes are also closely related to other systems and they influence each other. Therefore, general practitioners can use their knowledge of eye diseases to identify eye diseases and promptly refer the patients to specialists in order to avoid misdiagnosis and missed diagnoses, and protect patients' visual health.

Standardized training of residents is a very critical part of medical education and a necessary stage for cultivating qualified clinicians ^[5]. It is essential to strengthen the construction of health talent teams, and improve the quality and level of medical and health work. As a tertiary-level comprehensive hospital, the First Affiliated Hospital of Xi'an Medical University has practical resources and unique advantages in the collaboration of medicine and education. These advantages can provide a good training environment and rich clinical practice opportunities for the standardized training of students, thereby helping them to comprehensively improve their clinical medicine level. At the same time, the hospital also promotes the close integration of clinical practice and scientific research through close cooperation with the medical university, thus providing valuable experience and resources for medical education. Through these measures, the quality of medical education can be further improved, more outstanding clinicians can be trained, and positive contributions can be made to the development of the medical industry. Our hospital was approved as a national standardized training base for general practice residents in 2014 and changed to a national comprehensive training base for general practice residents in 2020. Currently, 263 general practice residents in our hospital have successfully graduated, and 100 are now in training. Since ophthalmology is highly specialized and the rotation time of standardized training for trainees of general medicine is short, there are some problems and challenges in the teaching process. This article will summarize and discuss the problems and experiences we encountered when teaching standardized trainees in general medicine.

2. Problems existing in the rotation of general practitioner training in ophthalmology

2.1. Short rotation time

General practitioners focus on cultivating general diagnosis and treatment thinking and general service capabilities in clinical practice. After working, they are mainly responsible for the prevention, health care, treatment, and rehabilitation of common and frequently-occurring diseases at the grassroots level. Therefore, their rotation time is primarily focused on cardiovascular medicine, neurology, respiratory medicine, gastroenterology, pediatrics, and general medicine wards, etc. ^[6]. Taking our hospital as an example, as a specialist training in ophthalmology, the two-weeks rotation time is short. In contrast, specialist training in the ophthalmology unit takes three years ^[7], and the time difference is huge. Ophthalmology textbooks have a lot of content, and the examination and treatment methods for eye diseases are very different from other clinical disciplines. Ophthalmology also involves a wide range of subspecialty content, thus it is challenging to provide systematic and comprehensive training to students with standardized training in general medicine in a short

period. In addition to the intense course itself, clinical practice is also subject to certain restrictions^[8].

2.2. Lack of attention to ophthalmology

Our hospital attaches great importance to teaching standardized trainees in general medicine and provides experienced senior teachers with master's degrees or above as teaching teachers for the department of ophthalmology. These teachers are very familiar with ophthalmology theory and have outstanding performance in practical operation. However, there is a big difference in the training time and plan between standardized trainees in general medicine and those in ophthalmology alone. There is no feasible template on how to organically combine ophthalmology knowledge with general practice services, and improve general practice diagnosis and treatment thinking according to the actual situation of general practice standardized trainees, and continuous exploration and research is needed. On the other hand, rotation trainees need to pay more attention to the subject of ophthalmology. Ophthalmology is usually regarded as a "marginal department" in clinical practice, with solid operability and specialized examination equipment needs^[9]. However, general medicine standardized trainees focus mainly on diagnosing, treating, and managing primary diseases. For this reason, their understanding of the subject of ophthalmology is not deep enough, and their mastery of basic knowledge is not solid enough. Therefore, it is necessary to continuously strengthen the training and guidance of general medicine standardized trainees in the discipline of ophthalmology.

We analyzed the educational background and employment direction of 100 trainees in general medicine standardized training, including two junior college students (2%), 98 undergraduates (98%), 7 social members (7%), 6 from county-level hospitals (6%), and the rest from township health hospitals (87%). In these hospitals, ophthalmology, otolaryngology, and stomatology are usually combined into ear-nose-throat (ENT) departments, and only second-level hospitals and above will have an independent ophthalmology department established. Therefore, students who receive standardized training in general medicine may have the concept of not paying attention to ophthalmology. Corresponding training and guidance must be strengthened to increase students' attention to ophthalmology. Sometimes, they may feel that more eye examination equipment is needed in their daily work and that they cannot really carry out practical work. Due to this understanding, it may lead to the neglect of ophthalmology knowledge in the learning process. To overcome this problem, it is necessary to strengthen the standardization of general medicine, and provide training and guidance to trainees in the discipline of ophthalmology to improve their understanding of ophthalmology and the level of general diagnosis and treatment thinking.

2.3. Lack of motivation in rotation students

Since the anatomy of the eye is complex and delicate, the retinal structure is relatively hidden and requires special inspection instruments to observe and understand, such as direct ophthalmoscopes, slit lamp microscopes, slit lamp front lenses, indirect ophthalmoscopes, etc. These devices are costly, and non-specialized primary hospitals cannot afford them. Even in the learning process of our department, students need to spend a certain amount of time and energy to master the use of eye examination equipment, which needs to be achieved through repeated observation and practical exercises. The professional nature of ophthalmic surgeries and operations makes students fearful. During the rotation process, unfamiliar instruments bring novelty to the students. However, they may also refuse to use the instruments, thinking that what they have learned cannot be applied to actual work, and therefore are unwilling to take the initiative to practise. This situation may have reduced students' interest and initiative in learning and affected the clinical rotation teaching work. In order to improve the situation, it is necessary to strengthen the guidance of ophthalmic practice for trainees in standardized general medicine training, stimulate their interest in learning, and provide them with more practical

opportunities, thereby improving their operational skills and practical application ability in ophthalmology.

3. Discussion on the teaching methods of ophthalmology training for general practitioners

3.1. Strengthening specialist knowledge and cultivating generalist concepts

To comprehensively and appropriately arrange the rotation courses for standardized training students in general medicine and increase their emphasis on ophthalmology, centralized training should be conducted on their first day of admission, also known as admission training. The purpose of admission training is to enable rotation trainees to adapt and integrate into ophthalmology work as quickly as possible in a short period of time. There are generally 2 to 4 students enrolled in each class. Admission training can be conducted in PowerPoint presentation and videos, and is organized by the teaching secretary responsible for standardized training. During the training process, roundtable discussions can be used to encourage standardized training trainees to introduce themselves and speak. The training content includes an introduction to the subspecialty settings, diagnosis and treatment methods, and work processes of ophthalmology; explanation of the diagnosis, treatment, and referral methods of common diseases, frequently-occurring diseases, and emergency diseases, as well as matters needing attention; consolidation of the specialist theoretical knowledge of related diseases and expansion of students' clinical thinking skills. The anatomy of the eye is complex and delicate, thus solid professional knowledge is essential. However, ophthalmology is also part of the overall body system, and only by considering various factors in specific clinical practice can the root cause of the problem be identified. In view of the characteristics of general medicine standardized trainees, we utilized a questionnaire to collect the needs and opinions of each trainee during the rotation process. Since our hospital began to accept students for standardized general medicine training, 256 questionnaires have been distributed, and the response rate has reached 100%. These questionnaires will provide important feedback and guidance for the continuous improvement of the quality and effectiveness of standardized training. These measures aim to increase trainees' interest in ophthalmology, increase their participation, and provide them with better opportunities to learn and grow. Through investigation, we found that general practitioner trainees mainly focus on the medical treatment of ophthalmology-related diseases, such as drug treatment of cataracts, glaucoma, conjunctivitis, pterygium, and other diseases. Through these survey results, we can understand the direction and focus of teaching, which is conducive to carrying out personalized and precise training ^[10].

3.2. Appropriate arrangement of rotation time

Ophthalmology is characterized by a large number of outpatient cases, which mainly involve common diseases and frequently-occurring diseases, and these diseases often affect patients' quality of life. The ward mainly receives surgical patients, which is highly suitable for trainees to observe and learn. Therefore, the internship time for standardized trainees in general medicine is divided into two parts. Firstly, there is a one-week internship in the outpatient department, focusing on learning some common outpatient diseases, such as conjunctivitis, and treating corneal foreign bodies. At the same time, we will have full communication and exchanges with teachers to accumulate diagnosis and treatment methods, medication plans, and experience dealing with common and frequently-occurring diseases. Another part is a one-week observation and learning session conducted in the operating room and ward, focusing on the perioperative management of common diseases, rehabilitation treatment, and the management of non-surgical emergency cases ^[11]. Due to the complexity of ophthalmic surgery, standardized trainees in general medicine need help in understanding ophthalmic surgery in a short period of time. However, in the standardized training manual, trainees must

complete several specialist case writings to accumulate experience and improve practical abilities. This arrangement enables students to gradually enhance their professional knowledge and skills in the field of ophthalmology in practice. Given the actual situation and the knowledge needs of the trainees, when arranging inpatients, the trainees will be mainly responsible for routine surgeries such as age-related cataracts and uveitis, as well as internal medicine diagnosis and treatment. This arrangement will help trainees to diagnose and treat common diseases when they join the workforce.

3.3. Improvement of teaching methods

3.3.1. Adopting a personalized clinical tutoring system

The tutor system can comprehensively guide students' learning and life in clinical guidance teaching. Instructors will not only impart medical knowledge but also provide help and guidance to enhance students' sense of belonging. This system is highly beneficial for improving students' professional theoretical level and clinical operation skills^[12]. Our department adopts a model of one tutor guiding two students. The selection criteria for tutors include voluntary registration and department review. Instructors need to hold a national standardized physician training and teaching qualification certificate, and doctors with experience in grassroots counterpart support and professional courses teaching will be given priority. Tutors will provide focused guidance to students based on the relevant information collected during their entrance training. This mentoring system contributes to the overall development and learning growth of students.

3.3.2. Implementing a follow-up teaching system

The hospital's ophthalmology clinic has a large volume, mainly involving some common and frequently-occurring diseases. Students can learn more about the clinical manifestations, diagnostic methods, and treatment plans of eye diseases by following the classes. The clinic is equipped with dual monitors and a slit lamp microscope with an assistant scope to improve the teaching effect. When following the class, students can improve outpatient cases, strengthen the study of theoretical knowledge, and operate practical skills under the guidance of teachers^[13]. In addition to routine work of clinical diagnosis and treatment, instructors will also use a slit lamp microscope with an assistant scope for diagnosis and treatment to increase students' interest and improve teaching effectiveness. It should be noted that since students cannot fully master micromanipulation skills in a short period of time, micromanipulation is only used for teaching, and the students' practical skill operations are focused on the physical examination of the eyes. Our hospital is a tertiary comprehensive hospital, and its wards mainly receive surgical patients and complex cases. The bed management system helps students to become familiar with new patients, and gain a broad and in-depth understanding of the diagnosis and treatment of diseases. Considering that most trainees of standardized general practice training will work at the grassroots level in the future, the cases they are responsible for mainly involve diseases related to common surgical and internal medicine diagnosis and treatment.

3.3.3. Diversifying the teaching methods

WeChat is widely used in life and teaching. Through the online WeChat platform, our department has enriched the teaching mode and content of regular student training, enabled the close cooperation of the teaching team, and made the integration of medicine and education closer. Teaching cases are provided through WeChat platform, including interactive teaching and multimedia teaching, in order to provide more teaching resources for students in standardized general medicine training. In addition, a more comprehensive range and types of cases can be provided through the ophthalmology case discussion in WeChat group, hence providing a better clinical thinking training platform for standardized training students. Doctors with different qualifications

can also supplement and analyze cases submitted by students at any time. The WeChat group also assists standardized training students in follow-up work, thereby increasing their understanding of treatment effects and improving their self-confidence and ability to master the cases. In addition, the maintenance of the WeChat group also enables two-way referrals, providing a more comprehensive range of employment options for standardized training trainees, and making it easier for patients in primary medical institutions to find suitable medical services. In addition, the public account provides widespread scientific knowledge to help students to learn to communicate with patients in an easy-to-understand manner. Using these WeChat platforms offers more convenience and communication opportunities for standardized training in general medicine, and promotes the improvement of students' learning and practical skills ^[14].

3.3.4. Improving the assessment system

To ensure that students can systematically master ophthalmology knowledge, improve their ability to analyze and solve clinical problems, and achieve the best teaching results, our department has established an excellent exit assessment system. In response to this system, the method and importance of exit assessment were emphasized, and corresponding reward and punishment measures were formulated. The assessment content includes daily scores of theoretical and practical skills assessments. Daily scores are assessed based on student's attendance, homework, and clinical performance. The practical skills assessment mainly focuses on everyday operations, such as corneal foreign body removal and tear duct irrigation, and is evaluated by the instructor. The theoretical assessment uses open-ended questions and is graded by 2 to 3 teachers. The assessment results will be recorded and entered into the all-staff trainee assessment system for storage. Such a system ensures a comprehensive assessment of trainees, and provides guidance and feedback for their progress ^[15]. This exit assessment system is designed to ensure all-round development of students and achievement of teaching goals.

3.4. Innovative teaching methods

Ophthalmology is a highly professional field involving complex and diverse diseases and multidisciplinary interactions. Due to limited rotation time, traditional teaching methods lead to a lack of interaction between teachers and students, which is detrimental to establishing a positive teaching atmosphere and improving practical skills. Therefore, it is essential to introduce new teaching methods based on improving the rotation process and system. During the rotation process of ophthalmology training, we mainly use two teaching methods: problem-based learning (PBL) and case study-based learning (CBL). PBL teaching method takes problems as the core and sets up situational models to allow students to learn around problems, with guidance provided by the teachers ^[16]. CBL teaching method is an inspiring, guiding, and expanding teaching model based on typical cases, with students as the main body and teachers as the guide ^[17,18]. The specific arrangement is as follows: the teaching teacher will select typical cases in the department one day in advance and ask questions about relevant issues, including the patient's clinical manifestations, causes, treatment options, common types of surgery, and anatomical characteristics of the site, precautions, and postoperative complications. General medicine standardized trainees conduct data review, analysis, and discussion based on these issues and then report their findings during the shift handover and ward rounds the next day. During the reporting process, the teacher actively guides the students to think and provide solutions. This method allows general medicine standardized trainees to receive training and feedback on actual cases in order to improve their clinical thinking and problem-solving skills. At the same time, the teaching teachers' guidance will help students to deepen their understanding of the cases and master the knowledge. This kind of teaching arrangement can improve general medicine standardized trainees' learning effect and clinical skill. Furthermore, students are also encouraged to think deeply after class to deepen their understanding and application of the learning content. This arrangement

is designed to help general medicine standardized trainees to continuously improve their clinical thinking and problem-solving skills in practice. This teaching method enables students to learn better and master ophthalmic knowledge, develop the ability to analyze and solve clinical problems, and improve practical skills in a positive and interactive teaching atmosphere under a complete rotation process and system.

4. Conclusion

In short, general hospitals should continue to explore the teaching methods and methods for standardized training of general medicine in order to complete the teaching tasks of standardized training of general medicine within a limited time, and cultivate excellent general medicine students, which means it is necessary to provide more targeted educational resources, adopt innovative teaching methods, and provide more practical opportunities and quality training for students, thereby further improving the training effectiveness. At the same time, the uniformity of the outgoing examination system is also very important to ensure that standardized trainees in general medicine can receive fair evaluation and equal recognition among different hospitals. Through such efforts, we can better meet the needs of standardized trainees in general medicine and cultivate more outstanding medical talents with general medicine literacy, which requires our continuous efforts. While constantly improving the teaching, we should also increase students' attention to teaching, and further unify the exit assessment system to ensure that general medicine trainees can develop and grow into outstanding and all-round medical professionals.

Disclosure statement

The authors declare no conflict of interest.

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