

Research Progress of Flipped Classroom Teaching Model in Clinical Health Education

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Abstract: This paper introduces the connotation and components of the flipped classroom teaching model, summarizes the application status of the flipped classroom in clinical health education, including main links, application effects and advantages, and finally analyzes the problems of the flipped classroom in clinical health education practice, in order to provide a basis for the exploration of clinical health education reform direction. To provide reference for the practice and research of flipped classroom teaching model in clinical health education.

1. Introduction

Health education is an important part of clinical nursing work, and it is also an effective means to prevent diseases and promote health ^[1]. With the rapid development and application of information technology, patients have more and more abundant sources of health education. Nowadays, patients' awareness of selfcare is increasing, and they have higher and higher requirements for health education, which makes the traditional health education methods far from meeting the needs of patients for health knowledge. Flipped classroom teaching mode is the product of the deep integration of modern information technology and education, which provides a new idea for modern education reform. Flipped Class Model (FCM), also known as flipped classroom, flipped classroom, that is to change the traditional classroom teaching sequence, students use network information technology to complete the autonomous learning of knowledge before class, teachers and students actively interact with deep learning to complete the internalization and absorption of knowledge during class time ^[2]. So as to achieve personalized teaching. At present, the flipped classroom teaching model has been widely used in the field of school education, and in recent years, it has also been actively practiced and studied in the field of clinical health education. This new teaching model is conducive to cultivating patients' subjective initiative in learning, promoting patients' deep learning and nurse-patient communication. This article reviews the application status of FCM in clinical health education, in order to provide a reference for the

practice of FCM in clinical health education.

2. Overview of Flipped Classroom

Flipped classroom refers to a teaching model in which teachers provide learning resources mainly in the form of teaching videos before class in the information environment, students complete independent learning of learning resources such as teaching videos in extracurricular time, and teachers and students engage in face-to-face questions and answers, interactive communication and other activities during class time^[3]. The unique feature of flipped classroom is “the flip of teaching process” rather than “the replacement of teaching media”^[4]. The essence of flipped classroom lies in the use of teaching technology to continuously improve the teaching process, so that all aspects of the teaching process are more perfect, so as to achieve the optimization of teaching quality^[5]. Flipped classroom is mainly flipped in the following aspects: (1) Teaching process: The traditional “teaching before learning” has changed to “learning before teaching”, that is, educators give patients teaching resources such as videos, ppt or paper materials before class, patients learn independently and test online, educators discuss and explore between educators and patients, and between patients and patients during offline face-to-face education, and educators give targeted answers to questions. (2) Teaching model: the teaching model was changed from teacher-centered and knowledge-inculcating teaching model to patient-centered and self-learning oriented personalized teaching model. (3) The role of educator: changed from knowledge impostor to learning facilitator, guide and resource producer. (4) Role of patients: from passive recipient of knowledge to active participant in knowledge construction. Its main feature is to reconstruct the learning process, realize the advance of knowledge transfer and the deepening of knowledge internalization, redefine the classroom from different links, and achieve the purpose of knowledge mastery and application^[6]. Foreign scholars Noora Hamdan et al. identified the components of the flipped classroom: Flexible Learning Environment (Flexible Environment), learning Culture (Learning Culture), carefully prepared learning Content (Intentional Content), Professional educators (Professional Educators)^[7].

3. Application of Flipped Classroom Teaching Model in Clinical Health Education

3.1 Main Links of Flipped Classroom Application

3.1.1 Prepare Materials and Supervise Learning before Class

Adequate preparation of materials before class is an important basis for patients' autonomous learning, and it is also a key element in the flipped classroom teaching model. At present, the pre-class learning resources of patients are mainly micro-videos and ppt. The content of health education should be divided first, and then micro-lecture videos should be made according to each independent knowledge point^[8]. Health education videos were made by referring to relevant literature and guidelines, combined with the health education courses and experience of our department^[9]. Patients can be invited to participate in the specific content, and also can be recorded with nurses. Later, it can be appropriately modified and checked by experts to ensure accuracy. At the same time, micro-lecture videos should be made according to the concerns of patients^[10], and key content should be taught in each micro-lecture, and the duration should be controlled within about 10 minutes to avoid learning fatigue. Only watching teaching micro-videos is easy to cause fragmentation of knowledge points^[11]. Therefore, attention should be paid to integrating knowledge points in teaching design, providing diversified teaching materials, and combining various forms such as health education ppt, operation process video and micro-video small lectures. In addition, Schuller et al.^[12] emphasized that text health education materials should be prepared at an

appropriate reading level for patients to understand. At the same time, it is very important to urge patients to learn on time.

3.1.2 Actively Interact and Answer Questions in Class

The positive interaction between educators and patients in class is an important part of flipped classroom teaching model. Flipped classroom mode has various forms and rich contents in class. The main teaching forms include pre-class evaluation^[13, 14] or pre-class learning achievement display^[15], summarizing and explaining the key and difficult points, group discussion^[14,16,17], question answering and knowledge expansion^[9,18], scenario simulation or case analysis^[13,16], etc. For the propaganda and education involving operation skills, it mainly carries out operation skills exercise^[19], and the educator guides the patients to practice by themselves after demonstrating the operation^[10]. One patient can also be randomly selected for realtime exercise^[13].

3.1.3 After-Class Evaluation and Feedback, Tracking Education

After class, we mainly carried out summary and evaluation, and tracked and guided the patients with poor mastery. “Appropriate evaluation” is one of the core elements of flipped classroom^[20]. The “flipped classroom” education model should be evaluated in a variety of ways, which can be formative evaluation or summative evaluation. In the current research, summative evaluation^[21,22] is the main method, and only a few scholars have combined formative evaluation^[14], that is, pre-class evaluation is added. A variety of forms are used for evaluation, such as self-test paper^[21], questionnaire evaluation^[22], theoretical assessment^[19,22], operational skills assessment^[10,19], satisfaction evaluation^[21, 22], education time evaluation^[9,21], and health education form evaluation^[9, 21], education knowledge mastery evaluation^[23,24], patient-patient mutual evaluation^[17], etc.

3.2 Application Effect of Flipped Classroom

3.2.1 Application Effect of Flipped Classroom in Obstetrics

In recent years, flipped classroom teaching model has been actively explored and tried in clinical health education, and has achieved remarkable results, mainly applied in obstetrics. Zhang Su et al.^[21] randomly divided 135 parturients undergoing elective cesarean section into the flipped classroom health education group and the traditional education group, and found that the flipped classroom health education group had higher education knowledge mastery, learning initiative, treatment compliance and satisfaction, and shorter health education time, which was consistent with the research results of Zhou Chen et al.^[22]. The randomized controlled study by Li Qing et al.^[9] showed that the flipped classroom model of health education could fully mobilize the learning enthusiasm of patients undergoing gynecological surgery, significantly shorten the time of health education, and improve the effect of health education. 98.4% of patients in the observation group believed that the form of education was specific. Kong Qiuju et al.^[16] showed that prenatal health education for primiparas based on the concept of flipped classroom can effectively control maternal weight gain, improve childbirth self-efficacy, reduce maternal and infant complications, and reduce psychological stress and anxiety during pregnancy. Ren Guangxiu^[15] believes that health education based on the flipped classroom model can effectively control weight gain during pregnancy, relieve anxiety and depression of primiparas, improve childbirth self-efficacy and breastfeeding self-efficacy of primiparas, reduce maternal and infant complications, shorten the time of each stage of labor, reduce childbirth pain, and improve the rate of natural delivery and the birth rate of normal weight newborns. The results are consistent with those of Kong Qiuju et al. [16], CAI Yongxue et al.^[14] and Wu Xiaoyan et al.^[25]. It can be seen that the flipped classroom teaching model has its feasibility and popularization in clinical health education.

3.2.2 Application Effect of Flipped Classroom in Radiotherapy Department and Internal Medicine Department

Flipped classroom teaching model has also been introduced into the clinical health education of radiotherapy department and internal medicine department. Chang Ying et al. [23] showed that the flipped classroom model could improve the knowledge mastery, education quality and compliance of health education for patients with tumor radiotherapy. Under this model, patients could understand the diagnosis and treatment and nursing process in advance by watching videos, thus avoiding nurse-patient conflicts and improving nursing satisfaction. Qiu Jing et al. [24] found that two-dimensional code scanning combined with flipped classroom mode can not only effectively improve patients' mastery of nasopharyngeal carcinoma radiotherapy related knowledge and self-care ability, reduce adverse reactions of radio-therapy, but also improve nurses' comprehensive ability. After the intervention, Lyu Yidan et al. [10] found that the insulin injection technique assessment scores of diabetic patients in the observation group were higher than those in the control group. Pan Lili et al. [19] showed that the flipped classroom health education group had higher recognition of teaching methods, higher training efficiency, and higher theoretical and operational scores than the control group. Chen Yao et al. [8] believed that health education based on micro-lecture combined with flipped classroom can significantly improve the self-management efficacy, quality of life and compliance of hemodialysis patients, which is worthy of clinical promotion.

3.2.3 Application Effect of Flipped Classroom in Surgery

Flipped classroom teaching model has also achieved significant results in surgical clinical health education. Sun Jian et al. [26] showed that the flipped classroom model can significantly reduce the clinical symptoms of children with atopic dermatitis, and improve the awareness of the disease by close relatives and patient satisfaction. Zuo Meng et al. [27] believed that the flipped classroom education model based on the network interaction platform was conducive to the longterm continuous guidance of self-care after discharge and reduced the incidence of complications. Jin Baochi [17] found in the study of patients with enterostomy that the flipped classroom education model promoted nurse-patient communication, improved patients' ostomy knowledge and operation level, self-care awareness and ability, ostomy adaptation level and quality of life. He Kunxia et al. [13] found that flipped classroom education mode can fully mobilize children's learning enthusiasm and initiative, improve knowledge mastery and the success rate of wearing glasses. In addition, the flipped classroom education model is also applicable to the caregivers of patients. Li Dongmei et al. [28] believed that flipped classroom education model could improve care-related knowledge level, rehabilitation behavior implementation rate and care ability of caregivers, and reduce care burden, which was similar to the research results of Xu Qing-qing et al. [18]. In contrast, there are few studies on the application of flipped classroom in clinical health education abroad. Only Schuller et al. [12] applied flipped classroom to telemedicine patients and found that it improved patients' autonomous learning and understanding of complex treatment information and reduced anxiety. It can be seen that the flipped classroom teaching model has strong applicability, high feasibility and significant effect in clinical health education, which is worthy of clinical application.

3.3 Advantages of Flipped Classroom Application

3.3.1 The Contents of Propaganda and Education Are Comprehensive, Unified and Accurate, and the Forms Are Diverse

In traditional health education, the content of education is often too simple, and the form of education is relatively simple, mostly through oral education, distribution of written materials or a combination of the two [29]. Moreover, the lack of evaluation of the effect of health education leads

to the poor effect of health education. Flipped classroom mode of health education is more flexible in teaching time and methods. The video education adopted has the advantages of vivid and intuitive, pictures, text, sound and film, and is easy for patients to understand and accept ^[30]. It can get rid of the boring traditional oral education, avoid the understanding deviation caused by the differences in age, education level and living habits of patients, meet the individual needs of different patients, and fully mobilize the learning enthusiasm of patients. At the same time, it is assisted by manual education, which overcomes the problem of forgetting in some patients, and facilitates the consolidation, understanding and preservation of educational content ^[31]. This model also avoids the differences in health education effects caused by the differences in nurses' knowledge reserves and health education capabilities (including language expression and emotional communication skills, etc.) in traditional education, and unifies the content of health education to achieve homogeneous health education ^[32]. In addition, the popularity of mobile devices such as mobile phones has made many patients accustomed to obtaining health knowledge through various ways such as the Internet, but studies have shown that many online information sources are inaccurate ^[33] or too complex ^[34]. Flipped classroom can improve the accuracy of patients' access to health knowledge ^[12].

3.3.2 Deepen Knowledge Internalization and Shorten the Time of Propaganda and Education to Improve the Quality of Nursing Service

The targeted answers and doubts in the classroom are conducive to finding out the weaknesses of patients' knowledge, filling in the gaps and solving the doubts, and strengthening the understanding, memory and mastery of health knowledge. In addition, this model shortens the time of health education and saves nursing human resources. Traditional health education requires nurses to educate patients one by one, which takes up a long working time. Flipped classroom mode health education is a combination of collective education, oral education and video education, which can complete the health education of multiple patients at one time, reduce the repeat ability of nurses' work, and significantly reduce the time of health education. It can improve the enthusiasm of nurses and nursing satisfaction, and promote the harmonious and healthy development of nurse-patient relationship ^[21]. The high requirements of this model for nurses also promote the improvement of nurses' comprehensive ability, which is conducive to further improving the quality of nursing service.

3.3.3 Achieve Initiative and Personalized Learning and Increase Interactivity

The flipped classroom is centered on the needs of patients and encourages patients to actively learn through diversified forms of health education. In the traditional classroom, nurses give oral education at the bedside and carry out one-way information transmission ^[35], while patients are in passive acceptance. In the flipped classroom, patients can independently choose the time, place and content of learning ^[36], and can choose fast forward, backward, pause or loop playback according to their own needs, which is more flexible and avoids the passive inculcating of traditional education mode and makes up for the time limitation of traditional health education. This asynchronous method frees up classroom teaching time for patient-centered synchronous learning ^[37], and also better solves the contradiction between the rapid update of medical technology and the limited medical resources. Pluta et al. proposed that classroom time should focus on the application of knowledge ^[38]. Therefore, nurses have more time to communicate with patients in the classroom and guide the application of relevant skills to patients.

4. Conclusion

As a new informationized teaching model, flipped classroom has opened a new chapter in the reform of clinical health education, and has broad application prospects in the field of clinical health

education practice, and has achieved preliminary results. However, its development is still in its infancy, and there are still some problems, which need to be further tested and explored, and constantly improved and optimized. The main problems are as follows: (1) The teaching evaluation index is single and not uniform. There are few hard evaluation indicators, and lack of formative evaluation and patient-patient mutual evaluation. In the future, we should pay attention to the research of flipped classroom in evaluation tools. (2)The intervention time was short and the sample size was insufficient. It is recommended that the intervention time be extended and the sample size be expanded in future studies. (3) formalize the video microlecture. The application of teaching videos is not the essential feature of the flipped classroom, and paper materials such as well designed manuals can also be used for teaching. Not all teaching contents must be made into videos, and video production should be selected according to the teaching content. (4) the network learning platform and supervision mechanism are not perfect. At present, the main learning platforms are Wechat and Rain Classroom, with Wechat being the most. However, Wechat platform cannot provide realtime feedback and supervision of patients' self-study before class, while “Rain Classroom” can make up for this defect and can be popularized and applied in the future. At the same time, it is necessary to strengthen the hospital network construction and provide professional and technical personnel. (5)The comprehensive ability level of propaganter is not uniform, the information ability is generally low, and most of them are responsibility nurses without training. It is necessary to strengthen the standardized training of educators on flipped classroom teaching and the assessment and certification of teachers. Therefore, in the future, we should gradually improve the existing problems, reform and innovate based on the basic national conditions of China and the status quo of clinical health education practice, and create a flipped classroom health education model with Chinese characteristics.

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