Establishment and Implementation of a Whole-course Education Mode for Clinical Interns’ Professional Quality

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Abstract. In order to explore a high efficiency mode to cultivate clinical interns with outstanding professional quality. We performed a whole-course education on clinical interns of grade 2014 and 2016, focused on professional quality, in the People’s Hospital of Rizhao. All the interns underwent a theory test, the Objective Structured Clinical Examination (OSCE) and the tutor evaluation of students before graduate, which were compared with grade 2011 to 2013 cultivated through traditional method. The professional quality of clinical interns were improved significantly \((P<0.05)\) underwent the new training mode. The comprehensive professional quality has been effectively improved, especially about the theoretical knowledge, clinical skills, humanistic literacy, psychological quality and scientific research thinking. The whole-course training mode of interns' professional quality can effectively improve the interns' professional quality, which can be used as reference in other teaching hospitals.

Background

Currently, with the change of basic social contradictions, people used to put forward higher requirements for the professionalism of doctors. Yet the overall professionalism of medical practitioners cannot match the peoples' expectations, which is an important reason for the disharmony between doctors and patients at this stage. Medical staffs processing good professionalism can effectively avoid the contradiction between doctors and patients.

“Medical professionalism in the new millennium: A physician Charter”, projected of the ABIM Foundation, ACP-ASIM Foundation, and European Federation of internal Medicine, begins: “The practice of medicine in the modern era is beset with unprecedented challenges in virtually all cultures and societies. These challenges center on increasing disparities between the legitimate needs of patients, the available resources to meet those needs, the increasing dependence on market forces to transform healthcare systems, and the temptation for physicians to forsake their traditional commitment to the primacy of patients' interests.” Professionalism is the basis of medicine's contract with society. The principles and responsibilities of medical professionalism must be clearly understood by both the profession and society.

In China, "China's Undergraduate Medical Education Standards - Clinical Medicine Major", projected of the Ministry of Education and the Ministry of Health, requires medical graduates to have preliminary clinical ability, lifelong learning ability and good professional quality. The basic requirements are divided into four areas: science and academics, clinical ability, health and society, and professional quality.

Since 2004, our hospital had been responsible for the education of clinical medical undergraduate students, never had we stop to explore ways to cultivate the medical students' professional quality. Therefore, we have taken a series of innovative measures to seek a scientific and efficient training model. Based on the research results both domestic and abroad, as well as the multiple angles questionnaire survey and the depth expert interviews we performed in the advanced work, we determined a certain education model suitable for the actual situation of our hospital under current period. The model was concluded under rigorous theoretical and statistical analysis, which should
include: professional ethics, theoretical skills, clinical skills, humanistic quality, communication skills, research innovation ability and psychological quality. Therefore, the exploration of an education model including all these seven aspects should be complement in medical interns.

Research Object

361 interns of clinical medicine in Jining Medical College from 2011 to 2016 enrolled in our study, it’s 175 in the observation group and 186 in the control group. There was no significant difference about education background, basic knowledge and basic skills between the two groups before internship.

Methods

Practice of "whole process professional quality training" mode teaching for clinical undergraduate interns from grade 2014 to 2016. In order to wholly improve the interns’ professional quality in terms of professional ethics, humanistic literacy, doctor-patient communication ability, theoretical skills, clinical skills and scientific research ability, we performed a series of innovative measures, included to improve entrance education, elective course setting, teachers demonstration, let students' participation in teaching management, open day for clinical skills, multi-level assessment, bilateral feedback and so on.

At the end of the internship, all interns underwent the graduation examination and OSCE about theoretical knowledge, clinical skills, communication skills and other abilities. The interns’ examination performances of grade 2014 to 2016 were compared with grade 2011 to 2013, which were cultivated through traditional method. The examination questions were provided from the same examination databases.

Since the 2014, humanistic literacy, communication ability and scientific innovation ability were emphasized during the evaluation by teachers and students' self-evaluation.

Cultivation Methods

Professional Ethics. Science the entrance education, the interns involved in the hospital culture, and feel the innovation of the hospital motto. We set up "moral lectures" ,in order to convey moral power by listening to moral stories, talking about moral perceptions. Specifically, it includes revisiting the "Hippocratic Oath" and the "Declaration of Chinese Doctors", watching the deeds of medical predecessors such as "Yi-wei HUA, Meng-chao WU", inviting moral models of the hospital to share their own stories, exchange their learning experiences. All these methods effectively strengthen the Interns’ professional concepts and consciousness.

In the course of practice, medical students' social responsibility consciousness were strengthened, through social public welfare activities such as outpatient volunteer service, free clinic in rural areas, volunteer service in nursing homes and voluntary blood donation should be carried out.

Humanistic Literacy and Communication Skills. The course of Humanistic Literacy was set on the list of practical lectures to construct the students’ theoretical framework of Humanistic Literacy and Doctor-patient communication skills. Situation simulation teaching is used in the teaching process to deepen understanding through role transformation. The community department was regarded as the required part of intern rotation. The interns should participate in community health work such as community supervision and health records establishment. Interns should participate in follow-up work of discharged patients to contact the society, go deep into patients' real lives, experience doctor-patient communication, and understand the needs of the people.

Professional Skills. The internship teaching activities were arranged regularly, the internship lectures, teaching rounds and discussion on teaching cases were arranged weekly, weekly and every two weeks respectively. The combination of theoretical knowledge and clinical practice was emphasized so all the teaching activities were students-centered. Many new teaching methods were
used, such as the "flipping classroom", "PBL teaching", "bilingual teaching" and "mind mapping", in order to help the interns to build up their clinical, critical and innovative thinking. The ultimate aim is to cultivate the interns’ self-learning ability and life-long learning awareness.

Among the course of departure examination and graduation examination, formative evaluation and summative evaluation were combined. A series of compound assessment were carried out to promote students' balanced development in theory, practice, communication and humanities, which including theoretical assessment, Mini-CEX assessment, DOPS skill assessment, twelve-stop OSCE assessment and teachers’ evaluation.

**Research Innovation Ability.** Experts in the hospital were invited regularly to conduct scientific research lectures, impart scientific research experience and share successful experiences. "one-to-one" tutorial system were established, for guiding students to participate in tutorial research, and cultivating clinical scientific research thinking. Research interest groups were set for communication, creative competitions and innovation awareness, that’s helpful for selecting excellent interns to lead all interns to enhance their research interest and research ability.

**Psychological Quality.** The study of political theory was strengthened which should be helpful for the interns to establish socialist core values. In order to enhance the sense of teamwork, improve the psychological endurance ability, we set additional courses like outward bound training and frustration education. Develop "teacher-student heart-to-heart" activities, guide students to carry out self-education, carry out self-criticism, and improve their self-awareness. A psychological post box was set to provide psychological counseling to certain students who met difficulty in self-adjustment and control their bad moods. Through the sharing of special cases, combined with successful experience and failure lessons, to improve the interns’ ability facing sudden situations in clinical work.

**Results**

Totally 361 interns of Jining Medical College from grade 2011 to 2016 enrolled in this study. There was no significant difference in the composition of interns among different grades (P > 0.05) (Fig. 1), and the graduation rate was 100% at each grade.

All these interns studied the probation class of grade four in the People’s Hospital of Rizhao, and there was no significant difference in the examination results at the end of the probation.

![Figure 1. The Gender Composition of the Interns at Each Grade.](image-url)
Graduation Examination Results

The examination includes Internal medicine, Surgery, Gynecology & Pediatrics. There were no significant differences in the average test scores, passing rate (>60 points ratio) and excellent rate (>80 points ratio) of students from grade 2011 to 2013 (P > 0.05); the average score and passing rate of students from grade 2014 to 2015 were not significantly improved compared with those of the first three grades (P > 0.05), yet the excellent rate was significantly improved (P < 0.05). The average score, passing rate and excellent rate of students at grade 2016 were all significantly higher than those of the previous three grades (P < 0.05). Table 1.

<table>
<thead>
<tr>
<th>Grade</th>
<th>Internal medicine</th>
<th>Surgery</th>
<th>Gynecology &amp; Pediatrics</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Average Score</td>
<td>Passing Rate</td>
<td>Excellent Rate</td>
</tr>
<tr>
<td>2011</td>
<td>62.19</td>
<td>76.47</td>
<td>10.63</td>
</tr>
<tr>
<td>2012</td>
<td>65.83</td>
<td>73.31</td>
<td>11.53</td>
</tr>
<tr>
<td>2013</td>
<td>63.57</td>
<td>71.82</td>
<td>12.96</td>
</tr>
<tr>
<td>2014</td>
<td>70.02</td>
<td>72.95</td>
<td>18.27</td>
</tr>
<tr>
<td>2015</td>
<td>72.15</td>
<td>77.21</td>
<td>23.68</td>
</tr>
<tr>
<td>2016</td>
<td>76.29</td>
<td>81.07</td>
<td>28.28</td>
</tr>
</tbody>
</table>

OSCE Achievements at the End of Internship

The OSCE includes twelve departments, that’s I Standardized patient (SP) inquiry, II Internal practical ability (four kinds of punctures), III Physical examination, IV Obstetrics and Gynecology, V Basic nursing skills, VI Pediatric, VII Interpretation of examinations, VIII Surgical skills (thread removal and dressing change), IX Emergency treatment, X Surgical skills (knotting and suturing), XI Case analysis, XII Medical history.

The total scores at grade 2015 and 2016 were significantly improved, and the achievements of the 2014, 2015 and 2016 sessions in the I, XI, XII departments were significantly improved. Table 2.

<table>
<thead>
<tr>
<th>Grade</th>
<th>I</th>
<th>II</th>
<th>III</th>
<th>IV</th>
<th>V</th>
<th>VI</th>
<th>VII</th>
<th>VIII</th>
<th>IX</th>
<th>X</th>
<th>XI</th>
<th>XII</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>2011</td>
<td>80.3</td>
<td>82.3</td>
<td>78.4</td>
<td>69.4</td>
<td>69.3</td>
<td>89.7</td>
<td>77.8</td>
<td>65.9</td>
<td>90.5</td>
<td>83.6</td>
<td>73.7</td>
<td>81.2</td>
<td>942.1</td>
</tr>
<tr>
<td>2012</td>
<td>81.3</td>
<td>82.6</td>
<td>77.8</td>
<td>77.4</td>
<td>60.5</td>
<td>88.8</td>
<td>77.5</td>
<td>74.2</td>
<td>82.0</td>
<td>78.8</td>
<td>77.0</td>
<td>88.0</td>
<td>945.9</td>
</tr>
<tr>
<td>2013</td>
<td>82.7</td>
<td>80.8</td>
<td>68.6</td>
<td>73.0</td>
<td>70.9</td>
<td>89.1</td>
<td>80.4</td>
<td>75.7</td>
<td>90.8</td>
<td>87.6</td>
<td>80.8</td>
<td>85.8</td>
<td>966.2</td>
</tr>
<tr>
<td>2014</td>
<td>90.3</td>
<td>83.6</td>
<td>78.4</td>
<td>74.2</td>
<td>73.9</td>
<td>90.7</td>
<td>78.7</td>
<td>65.9</td>
<td>92.5</td>
<td>83.6</td>
<td>77.9</td>
<td>91.2</td>
<td>980.9</td>
</tr>
<tr>
<td>2015</td>
<td>91.8</td>
<td>85.3</td>
<td>85.9</td>
<td>79.6</td>
<td>76.8</td>
<td>89.9</td>
<td>91.7</td>
<td>80.2</td>
<td>79.2</td>
<td>92.5</td>
<td>81.2</td>
<td>93.2</td>
<td>1027.3</td>
</tr>
<tr>
<td>2016</td>
<td>91.3</td>
<td>87.1</td>
<td>87.8</td>
<td>87.4</td>
<td>80.5</td>
<td>92.8</td>
<td>87.5</td>
<td>94.2</td>
<td>92.9</td>
<td>89.8</td>
<td>86.1</td>
<td>95.0</td>
<td>1072.4</td>
</tr>
</tbody>
</table>

At the end of the internship, each intern was evaluated by the teachers in terms of communication ability, clinical thinking ability, scientific research thinking ability and psychological quality. The results were compared with the interns educated under the traditional training mode. Table 3.
Table 3. The Result of Evaluation by the Teachers (Rate, %).

<table>
<thead>
<tr>
<th>Grade</th>
<th>Communication Ability</th>
<th>Clinical Thinking Ability</th>
<th>Scientific Research Thinking Ability</th>
<th>Psychological Quality</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Improved</td>
<td>Same</td>
<td>Declined</td>
<td>Improved</td>
</tr>
<tr>
<td>2014</td>
<td>67.3</td>
<td>27.5</td>
<td>5.2</td>
<td>62.2</td>
</tr>
<tr>
<td>2015</td>
<td>73.1</td>
<td>22.3</td>
<td>4.6</td>
<td>72.0</td>
</tr>
<tr>
<td>2016</td>
<td>77.3</td>
<td>19.5</td>
<td>3.2</td>
<td>71.3</td>
</tr>
</tbody>
</table>

Discussion

The purpose of this study is to explore a professional quality training method based on competency model, and establish a demand-oriented and competency-based training model for interns. This training model had been widely recognized by the leaders, students and teachers since its application in our college, for the professional quality training run through the wholly internship. It adapted well to the social needs of the new period and the needs of teaching reform. Through the implementation of a series of innovative measures, notable results had been achieved in improving clinical interns' professional ethics, humanistic literacy and communication ability, professional skills, scientific research innovation ability and psychological quality.

The training results about theoretical skills were assessed through graduation examination, which exhibited wholly improvement at internal medicine, surgery, gynecology and pediatric in the interns trained by this mode. At the beginning, in interns of grade 2014 and 2015, there was no significant improvement in the average score and passing rate, but the excellent rate was increased significantly. From the beginning of grade 2016, all the average score, passing rate and excellence rate were increased significantly, and the excellent rate seemed to be improved continuously. This may be due to the inadequate adaptability of the teachers at the initial period of the reform, which led to the the uneven adjusting at teaching and learning methods among different teachers and students.

The application of new teaching methods like PBL and flipping classroom need a gradual process of integration. The best fit between teaching content and the new methods had not yet formed at the beginning, which has not yet reflected the optimal effect of this model. As a result, only a few students benefited from this teaching model in the initial stage and achieved exceptional results.

The teachers’ awareness of teaching motivation and teaching level were improved continuously through enhanced training. As the exploration get deeper, the reform gradually penetrated into every part of teaching work, that can be supported by the wholly improvement of the grade 2016 of theoretical achievements, no matter passing rate, average scores or excellent rate.

In terms of clinical skills, the OSCE score showed that these tree aspects about SP inquiry, case writing and case analysis were improved significantly from grade 2014 and so on. In addition to these aspects, the total scores of the students in grade 2015 and 2016 were improved significantly too, which showed that this training mode had positive effects on improving all the practical skills especially about clinical thinking and doctor-patient communication ability.

Through the evaluation of the teachers, we can make the conclusion that more than 60% of the students underwent this mode improved their communication ability, clinical thinking ability and scientific research thinking ability, and more than half of the students have improved their psychological quality.

These improvements might due to a series of targeted measures under this model: 1) The teachers under this mode pay more attention to the cultivation of humanistic literacy and doctor-patient communication ability through the whole process. The interns can get communication skills through examples in a series of lectures. Teaching methods such as situation simulation teaching and role transformation were used, so that interns can truly stand on the patient's point, feel patients' feelings, understand their demands, and then combine community work with follow-up work. Contacting patients outside hospital and experiencing real situations can produce vivid and stereoscopic
understanding of doctor-patient communication, so that interns can communicate with patients independently, calmly, appropriately and thoroughly. 2) We carried out scientific research lectures and established "one-to-one" tutorial system, to cultivate the clinical scientific research thinking ability of interns. Let the interns participate actively in actual scientific research work and experience the real scientific research process, so as to generate scientific research interest. Regular competitions and exchange meetings might create opportunities for outstanding students in scientific research, improve their scientific research ability and enable them to do independent scientific research work in the future. 3) Through the study of political theory, the interns are guided to establish the socialist core values, so as to enrich their hearts with advanced ideas, cultivate their sense of teamwork. The interns were made to feel the important of team work exactly from the before intern training. In the psychological courses, the interns were taught self-psychological counseling skills. In view of individual problems and negative emotions in certain interns, real-time targeted psychological counseling was set for timely guidance. Teachers' evaluation shows that through the selected highly representative failure cases in each departments, interns can provide better coping capacity in clinical work, that greatly reducing the clinical outburst due to negative emotions in the conflict between doctors and patients.

It's generally accepted by no matter the doctors, teachers and students that this training mode can wholly develop students' potentials, especially in terms of the great improvement of humanistic literacy and doctor-patient communication ability, as well as the establishment of creative thinking and critical thinking. Ultimately the highly qualified medical talents should be made of the interns with caring, good communication, happy communication, humanistic spirit and tough character, which meet the social requirements currently. This training mode has excellent practicability and operability, and is suitable for popular use in other teaching hospitals. Through the diverse training, the medical students could achieve a comprehensive improvement to be excellent doctors.

Acknowledgement

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References


