

The Study on the Application of Continuous Quality Improvement in the Clinical Education of Nursing Trainees in a Universal Hospital of China

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Abstract The clinical education of nursing trainees should be an important task for the teaching hospital. However, this work is always ignored to some extent. In this study, the continuous quality improvement (CQI) approach was applied in the clinical teaching of nursing trainees. The result indicated that CQI could raise the training quality for the nursing trainees, including the levels of professionalism, communicative competence, nursing theory and operation. **Conclusion:** Based on the present results, we suggested that CQI approach should be used in practice teaching during the period of clinical training for nurses.

Keywords: *communicative competence, continuous quality improvement, clinical education, nursing trainee*

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1. Introduction

As an effective approach, continuous quality improvement (CQI) has been widely used in many aspects of works in hospitals, especially in the nursing work. Zhang et al [1]. designed the quantitative evaluating indicators and exam methods to observe the effects of CQI in the shift-to-shift changes of the nurses, and found that the usage of CQI could significantly improve the timeliness, the completeness and realness of the nursing records. Meantime, the deficiency rate of writing decreased, too. So CQI could increase the quality of shift-to-shift change for nursing work. Xu et al [2]. studied on the application of CQI in the restricting nursing for the ICU patients and found that the acceptance degree of the patients, the satisfaction of the patients' families and the nursing knowledge of the nurses were gotten notably increased. Therefore, they considered CQI could decrease the occurrence of adverse events, elevate the theories relate to restricting nursing and improve the relations between nurses and patients to some extent. Lee et al [3]. observed the medication incidents (MI) of the nurses of the emergency department, and found that the MI of the nurses who applied in their daily work was lower than those without application. This result indicated that the usage of CQI could reduce medication error and was beneficial for the nursing quality or safety. On a whole, many reports proved that CQI had used in different aspects of nursing work. With the usage, the nursing quality and service level got significantly improved.

In fact, except the work of patient care, the education of nursing trainees also is an important task that must not be ignored by the teaching hospital, especially the Universal hospital; and it is necessary to be improved with CQI approaches. However, to our knowledge, the studies relate to the improvement of nurse education mainly focus on the phrase of school [4,5,6]. A small and increasing literature revolves the application of CQI in nursing trainees in clinic. In this paper, we tried to apply CQI in the education the nursing trainees of our hospital, a universal hospital in Mainland China, and hoped to pose a references for improving the teaching quality in clinic.

2. Material and Methods

2.1. Subjects

200 undergraduate students were recruited from Affiliated Hospital of Jining Medical University and taken as the objects of this study. They were randomly divided into the experiment and control groups; 100 persons per group.

2.2. Methods

The first three months since the undergraduate nurses began the clinical practice was designed as the adaptation period. In the period, all the nursing trainees were arranged to be familiar with the clinical environment; and meantime, they were taught by the clinical teachers according to the traditional methods in which no idea of CQI was involved.

2.3. First Exam

Three months later, in order to understand the baseline of theory and practice and further exclude the effect of the grouping, all of 200 nursing trainees were tested with professionalism, communicative competence, nursing theory and operation. The former two test papers were designed according to Zheng's report [7]. The test for nursing theory and operation were made out by our research team according to the Universal basic nursing textbook. The total exam scores set as one hundred, and finally judged with four degrees referred He's study [8]: <60 was taken as D grade (equal to fail the exam); 60-79 as C grade; 80-89 as B grade; >89 as A grade (equal to excellent score). The exam excellent (failure) rate was equal to the percent of the persons with A (D) grade score.

2.4. Design of the Strategies for Improvement

According to the first exam results and the previous teaching experiences, a detail analysis was performed and the reasons were listed. According to each of the reasons, the strategies were respectively designed and were applied in the education of nursing trainees in the experiment groups. The nursing trainees in the control groups were still taught with the traditional method.

2.5. Second Exam

Six months later, the second test was carried out with the new contents, which still included professionalism, communicative competence, nursing theory and operation.

2.6. Statistical Analysis

The software Statistical Package for the Social Sciences (SPSS), version 15.0 was used to analyze the data. The differences between the quantitative data were analyzed with Chi-square test, and the relativities were analyzed with Logistic regression analysis. $\alpha = 0.05$ was taken as the test standard.

3. Results

3.1. The First Exam Results

As shown in Table 1, there was no difference between the exam results of the nursing trainee in experiment and control groups ($P > 0.05$). The percentages of the nursing trainees who achieved excellent results were both less than 30% in the two groups, and there were always several students failed in one or more items (Table 2).

Table 1. The first exam results of the nursing trainees in the experiment and control groups

Subjects	Experiment group	Control group
Professionalism	81.8±12.3*	79.5±14.1
Communicative competence	75.8±18.4*	77.2±13.8
Nursing theory	80.7±15.6*	81.3±17.7
Nursing operation	78.5±16.2*	77.9±15.6

*means there is no difference between two group ($P > 0.05$).

Table 2. The respective rates for the excellence and failure results in the first exam

Subjects	Experiment group		Control group	
	Excellence rates (%)	Failure rates (%)	Excellence rates (%)	Failure rates (%)
Professionalism	12*	8 [#]	13	6
Communicative competence	15*	1 [#]	17	0
Nursing theory	26*	7 [#]	23	7
Nursing operation	19*	14 [#]	18	15

*There is no difference for the rates of the excellent results between the experiment and control groups ($P > 0.05$); # There is no difference for the rates of the failure results between the experiment and control groups ($P > 0.05$).

3.2. The Improvement Strategies

With brainstorming method, the reasons related to the low quality of clinical teaching were analyzed. In the analytic results, there were many factors related to nursing trainees, which revolved not only the nursing trainee

themselves, the teachers, but also the nursing management. Aimed at the key factors, we made out the corresponding strategies and applied them in the clinical teaching of the nursing trainees in the experiment group (Table 3).

Table 3. The reasons analysis and the corresponding strategies

Reasons analysis	The corresponding strategies
Relate to nursing trainees themselves	
Insufficient understanding on nursing work	Enhance the recognition of the nursing work
Lack of service sense	Highlight the essence of serving patients
Poor theory	Strengthen learning professional theory accompanying the clinical practice
Poor operational skills	Make more operational chances for trainees
Relate to clinical teachers	
Low theoretical level	Enhance learning and exam of professional theory exam
Lack of clinical teaching consciousness	Highlight the importance of the clinical teaching
Insufficient communication skills with patients	Strengthen the training of such skills
Lack of operational skills	Select teachers with good operational skills
Relate to nursing management	
Lack of CQI program for clinical teaching	Create the corresponding program
Lack of screening and exam rules for excellent teachers	Make the screening and exam rules

3.3. The Second Exam Results

The exam scores of the nursing trainee in experiment group were significantly higher than those in control group ($P < 0.05$) (Table 4). The percentage of the excellence scores in the experiment group was more than 50%, which was notably higher than that in the control group ($P < 0.05$). There was no D grade of exam results in the experiment group but the control group (Table 5).

Table 4. The second exam results of the nursing trainees in the experiment and control groups

Subjects	Experiment group	Control group
Professionalism	91.5±16.5*	83.5±15.7
Communicative competence	89.8±21.7*	79.2±13.9
Nursing theory	95.5±23.4*	84.3±19.5
Nursing operation	97.8±18.7*	80.4±17.1

*means there is significant difference between two group ($P < 0.05$).

Table 5. The respective rates for the excellence and failure results in the second exam

Subjects	Experiment group		Control group	
	Excellence rates (%)	Failure rates (%)	Excellence rates (%)	Failure rates (%)
Professionalism	54 [▲]	0	24	4
Communicative competence	72 [▲]	0	32	1
Nursing theory	89 [▲]	0	49	5
Nursing operation	95 [▲]	0	62	8

[▲]There was significant difference for the rates of the excellence results between the experiment and control groups ($P < 0.05$).

3.4. Comparison of the Two Exam Results in Every Group

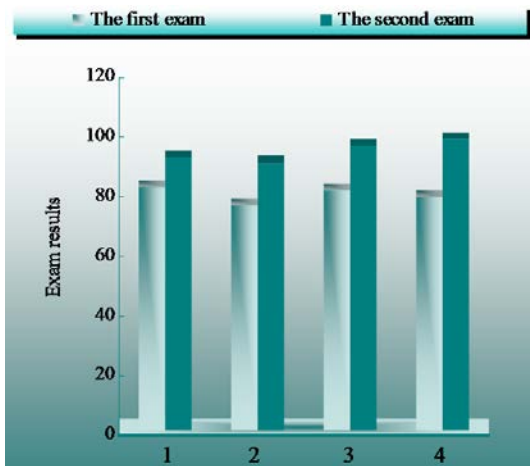


Figure 1. The comparison of the primary and second exam results in the experiment group

Comparatively, the exam results of the second exam were significant higher than those of the primary exam results in the experiment group ($P < 0.05$). 1, 2, 3 and 4 represented the examinations of professionalism, communicative competence, nursing theory and operation, respectively.

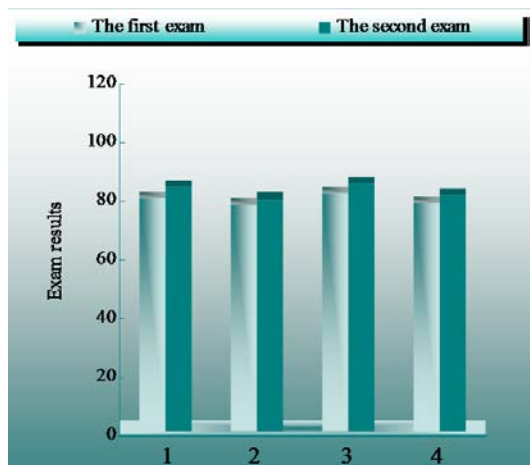


Figure 2. The comparison of the primary and second exam results in the control group

Comparatively, there was no difference between the primary and the second exam results in the control group ($P > 0.05$). 1, 2, 3 and 4 represented the examinations of professionalism, communicative competence, nursing theory and operation, respectively.

The second exam scores were significant higher than those of the first exam in the experiment group ($P < 0.05$) (Figure 1). There was no difference between the two exam results in the control group ($P > 0.05$) (Figure 2).

4. Discussion

Clinical training is the most important component of nursing education, even more than classroom learning [9]. This is because that it enables students to achieve real experience with patients and practice the skills which they have learned in the classroom [10]. Therefore, as a more practical profession, the educational process of nursing should culture students the ability to perform professional activities in real-life situations rather than simple expressing understanding of principles [11]. However, most of the teaching hospitals do not take the clinical teaching of nursing trainees seriously in China. Accordingly, the present study on the nursing education could reflect the whole status in Mainland China to some extent. Aiming at this status, the present study focused on the improvement of clinical reaching of nursing trainees.

As shown in the results, the average scores of the four subjects in the first exam, including professionalism, communicative competence, nursing theory and operation, were on the low side, and the excellence rate were all less than 30%. There were some nursing trainees failed in the exam in both experiment and control groups. These results showed that there was no difference between the training effects for the nursing trainees in the two groups at the beginning of clinic training. According to such a status and comparing with the past experience of clinical teaching, we carefully analyzed the causes and made out the corresponding strategies to improve the clinical education of nursing trainees. Firstly, the nursing trainees' own reasons were the main factors which affected the training quality. The reasons mainly came from the basic nursing, including insufficient identification of nursing job, poor service consciousness, poor theory, low operation skills and so on. This opinion was different from that of Ding et al. [12], who thought the deficiency of acknowledgement of the excellent nursing was the decisive factor. In our opinions, excellent nursing should be a target only for the registered nurses; while basic nursing should be the primary task for the undergraduate nurses. Through enhancing the acknowledgement of the

importance of clinical training, the nurses could be benefited from two points: (1) The theoretical and practical training provided in the classroom and laboratory in nursing school are reinforced with practical training performed in the clinical setting [13,14]; (2) They will get the opportunity to repeatedly use the skill and gain feedback on performance [15]. Only based on such acknowledgements, the enthusiasm and initiative of learning in clinic setting will be really motivated, and there will be a good effect for the nursing trainees. Secondly, clinical teachers played an important role in the phrase of training for the nursing trainees. Yu et al [16]. considered that the key influential factors to the training quality laid on the correct and effective guidance of teachers. Under the incorrect instruction, the trainees could not get the learning of theory and the training of operation. In another studies, the researchers thought that the types of teaching had great effects on the training quality [17,18]. To our understanding, the consciousness of clinical education was the key factor that affected the learning quality for the nursing trainees in the clinical setting. All the nursing teachers should indeed recognized that clinical teaching is an important part of nursing education, and take the clinical teaching as an essential part of the nursing work [19]. Besides, as a clinical teacher, he should continuously learn new knowledge relates to nursing on the basis of mastering the basic nursing theory, because most of nursing trainees are interested in different specialty area of nursing, and their experiences in clinical practice lead them to pursue areas of nursing with more interesting [20]. Lastly, nursing management is another important factor affect the quality of clinical training. As a manager who is in charge of the nursing trainees, she must cognizes that accurately understanding and treating the relative factors that influence the quality of clinical education is helpful for the culture of qualified nursing talents [21], and the nursing trainees without sufficient clinical skill competency will compromise patient care and safety [13]. Additionally, increasing the teaching quality of the clinical teachers and the learning effect of the trainees are the necessary duty for the teaching hospital, especially the Universal hospital [22]. From this view point of management, the rules that benefit clinical teaching should be created or improved.

After being interfered with CQI in this study, the training effects for the nursing trainees in the experiment group got notable improvement. The average exam scores of the trainee in the experiment were significantly higher than those in the control group, and the excellence rates of the former group were also obviously higher than those of the later one. There was no trainee failed in all the exams in the experiment group but in the control group. These results indicated that the training quality of nursing undergraduates achieved significant increase on the four subjects which including professionalism, communicative competence, nursing theory and operation, and these harvests can not be gained through classroom learning alone [23]. These results were consist with those of other two studies which reported that the improvement of teaching approaches and nursing management could increase the effects of clinical education [24,25]. Based on the results, we consider that the training quality could be significantly raised by CQI method, and it is necessary to

apply CQI in practice teaching during the period of clinical training for nurses.

In conclusion, the study shows that the application of CQI could raise the training quality for the nursing trainees, including the levels of professionalism, communicative competence, nursing theory and operation. The present results suggested that CQI approach should be used in practice teaching during the period of clinical training for nurses. Although such information has been transferred from the paper, the clinical education of nursing trainees is a systematic project and affected by lots of factor [26]. In the next step of study, we will further deeply analyze these factors and accordingly design more detail measures to rise the training quality for nursing trainees.

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