IJBPAS, May, 2015, 4(5): 3115-3124

ISSN: 2277–4998

International Journal of Biology, Pharmacy and Allied Sciences (IJBPAS)

'A Bridge Between Laboratory and Reader'

www.ijbpas.com

PIE (PROBLEM, INTERVENTION, EVALUATION) RECORD TRAINING IMPACT ON NURSE RECORD QUALITY BY NURSING STUDENTS

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ABSTRACT

Transferring information in proper way and recording report is one of heavy responsibilities of nurses which aim at facilitating communication, research, training and helping analysis and decision making. Nothing is more useful than perfect and standard record in expressing all cares delivered to the patient. Current work aims at investigating impact of PIE method on quality of nurse record by nursing students in area 1. The students passed internship courseininternal departments, surgical centers and hospitals affiliated to Tehran University of Medical Sciences. Research statistical sample include 30 nursing students in area 1. Convenience sampling method was used. Research method is quasi-experimental single group, ex and post. Data were analysis using SPSS software, Version 22, as well as paired t-test and Mann-Whitney test. Analysis of research results showed training recording in PIE method increases record quality in nursing students.

Keywords: PIE, Nurse Record, Record Training

INTRODUCTION

Disease and heath are two concepts which have been associated with human being since long ago, perhaps since the beginning of the creation, and human being has hardly attempt to release from disease [1]. The important point is providing qualitative and quantitative care and protective services to patients and writing and recording matters by employees in health and medical organizations especially nurses [2]. Quality and coordination of cares in modern care organizations is related to relationship between care providers [3]. One of the most effective communication ways for care providers is recording the care and patient's reaction to the treatment [4]. Recording nursing cares is an important tool for accuracy, qualification, and evaluation of treatment and care interventions and it is a significant tool for supporting and protecting legal rights of patient and nurse.

Primary purpose of recording information of patient's evaluation is providing a collection of information which is turned into a database for patient's care. Such database helps that patient's problems are identified and nurse diagnosis is described [2]. Accurate record should include information related to nursing reviews, patient's problems, care plan, daily progress path, educational program and discharge planning. A nurse report should be complete, accurate, relevant, real, timely, regular, consecutive, legal and confidential. Eleven principles should be observed in writing nurse record. Principles in content aspect include: recording general conditions, recording prescribed medications, recording orders and acute changes, follow-up record, recording para-clinical results, recording vital signs and recording discharge planning. In structure aspects, writer information, time and date of record is needed [5]. Hence, accuracy is one of the main characteristics of legal records and it is very important for the nurse to be aware that the record should be written perfectly [6].

Nurse records are generally classified into two groups: problem-oriented medical record (POMR) and source-oriented patient records (SOPR), each of which with their own advantages and disadvantages. The most common nurse record approach is currently source-oriented patient record, which is also known as traditional-source or narrative chart. The nurse writes patient's situation, performed interventions and his reaction to interventions descriptively in specific papers. If nurse record is traditional approach is done properly, it includes valuable information regarding patient's problems, interventions, and his reaction to interventions which are recorded unceasingly, and a quick review of all nursing cares can be provided. In this nurse

record approach, the report is written on disease progress report form and current forms without specific structure, and thus there is information scattering and quality and quantity of the written material is variable and comparison is difficult [7]. Problem-oriented medical record approach has various types of nurse records including focus charting, charting by exception, PIE, Subjective Data=S, Objective Data, Analysis, Plan, Evaluation (SOAPE) and DAR (data-action-response). PIE (problem-intervention-evaluation) is organized based on patient's problems and his information. This system was originally used in Craven Country Hospital in North Carolina since 1985. In this system, care programs along with disease progress trend and determined problem are recorded in a form. At the beginning of each working shift, patient is totally investigated using flow sheet or printed papers. Then, patient's problems are identified and numbered [8]. PIE is composed of three stages: in the first stage, the problem is written in the section related to problems as nurse diagnosis using P (problem) letter according to North American Nursing Diagnosis Association (NANDA). In the second stage, necessary nursing cares for nursing diagnosis are written in IP (intervention- problem) section. Finally, patient's reaction to treatment care is written in EP (evaluation – problem) section [5]. Using PIE approach the nurse is assured that his record contains nursing diagnosis, intervention and evaluation, thus record accuracy and quality is increased by penetration in nursing process [2]. Using nursing process, the nurse is encouraged to meet needs of the patient and record cares constantly and an organized framework is developed for thinking about the report which should be recorded and it does not need much time [9].

Previous studies suggest inappropriate status in nurse record and reports denote 13 percent of clinical errors are related to errors in documentation [10]. Findings by Paans *et al* [11] on accuracy and quality of records indicate accuracy of record in performing nursing interventions has lowest score in 95 percent of records.

Currently nursing students write their records using narrative (traditional) approach. They often do not write patients' problems and taken actions and reactions and evaluations in their records which leads to lack of quality in records and thus inadequate care for patients. No research study has been conducted on comparing PIE and traditional approaches in Iran on nursing students and nurses. No study has been registered in journals also in other countries since 1987. Thus, current research study aims at investigation of PIE (problem, intervention - evaluation) impact on nurse record quality in nursing students. Using

PIE record leads to proper application of nursing process and promotion and academic and practical dynamism in nursing students. It would increase enthusiasm and value of nursing profession by the students and finally it causes that students, who will enter in clinical environments as nurse in the near future, would be able show higher accuracy in recording the problem and evaluating patient's reaction to nursing intervention using this approach so that nursing care is provided and recorded in higher quality. Therefore, satisfaction toward nursing care is increased from the society.

STATISTICAL POPULATION, SAMPLE AND SAMPLING METHOD

Statistical population of research includes nursing students in Area 1 who were passing internship course in internal departments (Neurosurgery, Central, endocrinology, cardiology) of selected surgical centers and hospitals affiliated to Tehran University of Medical Sciences. Research statistical sample include 30 nursing students in area 1. Convenience sampling method was used. Sample size was calculated using Formula 1. In Equation 1, $P_0 = 0.5$ and prediction for its reduction to $P_1 = 0.1$ following respective interventions. $\alpha = 0.05$ (95% confidence coefficient) and $\beta = 0.1$ (90% power of test). Considering possible loss of samples during study, sample size was specified. Given inclusion and exclusion criteria, finally 30 students took part in the study.

$$n = \frac{2(z_1 - 2 + z_{1-\beta})^2 pq}{(p_1 - p_2)^2} \qquad (1)$$

METHODS AND DATA COLLECTION TOOL

Research method is quasi-experimental single group, ex and post which was conducted in selected surgical centers and hospitals affiliated to Tehran University of Medical Sciences. Data collection tool is an author-made checklist for nurse record quality. This checklist includes two sections; section 1 is related to demographic data and section 2 is related to nurse record quality containing 21 nurse record items, which were investigated using following criteria: no case (no score), not observing (0), somehow observed (1), incompletely observed (1), optimally observed (3), and completely observed (4). Quality of records was compared at four levels: totally optimal with score above 63 (over 75%), optimal with score between 42 and 63 (50 – 75%), relatively optimal with scores between 21 and 42 (25 – 75%) and non-optimal with scores smaller than 21 (smaller than 25%). Following completion of questionnaires and data collection, data were analyzed using descriptive and inferential statistics and paired t-test and Mann-Whitney test in SPSS software, Version 22.

Reliabilityof Tool

A test was used in order to determine reliability of patient's review form and the checklist for investigation of quality of traditional and PIE nurse record forms. Quality of records by 10 nursing students with research criteria was examined. Following data collection, the items were examined in terms of consistent homogeneity and information for investigating tool's reliability were analyzed using Cronbach's alpha test. Cronbach's alpha for checklist of nurse record evaluation was in optimal level (0.85) and Cronbach's alpha for patient's evaluation from was obtained as r = 0.87. Reliability of traditional and PIE nurse record form was r = 0.85.

RESULTS

Research results, tables and statistical analysis are provided in this section.

Personal demographic characteristics of research units including absolute and relative frequency distribution of age, gender, student work experience, and passing educational topic of nursing record principles during the study period showed maximum age of students was 22 (60%) and minimum age was 21 (3.3%). 66.7 percent of students were female and 33.3 percent were male. 46.7 percent of students had student work experience and 53.3 percent did not have student work experience. 40 percent of students had passed course on record principles during study period and 60 percent of students did not mention it.

Results related to comparing score of nurse record quality in area 1 before and after intervention are given in **Table 1**.

Table 1: comparing score of nurse record quality in nurse internship before and after intervention

Record quality score	Before intervention		After intervention		Test result Paired sample t-test
	No.	Percent	No.	Percent	
Totally optimal	0	0	17	56.7	T = -9.229 Df = 29 P = p < 0.001 is significant
Optimal	16	53.3	13	43.3	
Relatively optimal	12	40.6	0	0	
Non-optimal	2	6.7	0	0	
Total	30	100	30	100	
Mean	49.93		77.45		
SD	13.13		9.22		

Paired t-test results indicate there is significant statistical difference between mean percent of quality score before and after training (p < 0.001). Comparison of mean scores before and after training indicates mean score of record quality is increased considerably after training.

DISCUSSION AND CONCLUSION

Independent variable in this research is IPE record approach and dependent variable is record quality and it aims at investigating PIE (problem – intervention – evaluation) record approach training on nurse record quality in nursing students. Research findings result from investigation of 12 nurse records which were analyzed.

Considering Table 1 it is observed that mean score of record quality before

intervention is 49.93% (SD = 13.13) and it is 77.45% (SD = 9.22) after intervention.

In relation with determining nurse record quality of nursing students in internship before training PIE record approach, results showed maximum score of record quality before intervention was 53.3% and minimum score was 6.7 percent at non-optimal level. Findings by Mashoofi et al[12] in educational hospitals of Ardabil in Iran showed that in studied records the average nurse record was 51.2 percent. According to findings in this work, only about half of data were recorded by nurses. They mentioned such factors as unawareness of some cases which should be recorded by nurse, negligence to record importance, poor nursing management and medical records may leads to creating incomplete records which includes clinical training for nursing students. To this end, findings by Griffiths et al. [13] showed only 40 percent of interventions are recorded in nurse records. The study by Satarzadeh[14] in Iran on quality of CCU nurses in Mustafa Khomeini Hospital showed 92 percent of nurses gain poor score in nurse record quality leveling and 7.7 percent of nurses gain average score. In this relation, findings by Hanifi and Muhammadi[15] in Iran indicated only 17.09 percent of nurses had optimal nurse records and 35.81 percent of nurses wrote incomplete nurse records. They found factors such as poor recording; lack of knowledge and awareness in nurses regarding proper way of recording as well as lack of suitable control and supervision system affect nurse record quality. Findings by Chaboyer et al. [16] showed only 5.6 percent of nurses wrote nurse record form at optimal level and 25.9 percent wrote it at average level and 68.5 percent showed poor and very poor performance in this regard. Findings by Macgain[17] in England indicated 83 percent of medical records are incomplete in terms of documentation of vital signs and disease progress note which are filled by physicians and nurses. According to reports resulting from investigation of nurse records by clinical groups of health group 2003, nurse records rarely declare all incidents and events related to patients and their training and most of them do not refer to record's structural aspects (name and signature of writer, time and date of record, etc.) [18].The study by Tavakoli[19] in Isfahan University of Medical Sciences emphasizes lack of adequate training for medical personnel in this regard. Above research findings are consistent with findings in the current work. In the study by Lee et al. [20] it was found out of 373 reviewed records, patient's problems and needs as well as nursing diagnosis were defined according to standard criteria in 80 – 90 percent of cases and most of them contained name and signature of writer in 98 – 99 percent of

cases. Similarly, Ariaee [21] reported all nurse records contained necessary information about nursing care. Three latter works do not support findings in the current work. The probable reasons for inconsistency may be different sample size, different checklist structure, different research methods and different departments.

In relation with determining nurse record quality of nursing students in internship after training PIE record approach, results showed maximum score of record quality after intervention was 56.7% at totally optimal level and minimum score was 43.3 percent at optimal level. In this regard, Abbaszadeh *et al*., [22] conducted an experimental research using two groups and measured subjects before and after training. Their sample included 62 nurses working in Kerman hospitals in Iran. Their findings showed no significant difference between two groups in terms of demographic variables and there was significant difference between knowledge (P = 0.000), attitude (P = 0.000) and performance of record writing in case and control groups. Also, no significant relationship was observed between demographic variables and increased knowledge of nurses due to constant training. Overall, constant training plan led to increased knowledge, attitude and performance of nurses. To this end, findings by Rafiee *et al*. [23] showed nurse record pattern was not in high quality, however, considerable changes were observed in record quality following holding educational courses on record writing. Findings by Arzamani *et al*. [24] indicated mean status of medical records showed significant difference in nine main medical forms before and after training and it was increased after training ($p < 0.001$).It was calculated as 75 and 79 percent before and after training, respectively. Overall it was found training has positive impact on completeness of medical records and all centers need regular and constant training to increase quality of medical record documentation. Findings by Abdi *et al*. [25] showed some record writing standards increased after training. For example: recording general and hemodynamic conditions based on clinical signs (from 4% to 85%), recording vital signs (from 2% to 68%), recording use of mechanical tools for care and recording rest and sleep status and excretory activity of the patient (from 10% to 90%), recording follow-ups in the next shift (from 20% to 100%), recording risks (fall, medication mistakes, etc.) (from 5% to 58%), recording trainings offered to patient (from 1% to 90%). Overall, observance of record writing standards reached to 78 percent after intervention from 56 percent before intervention. Above findings are consistent with findings by current work.

Regarding comparison of nurse record quality by nursing students before and after

training PIE record approach, results of paired t-test show there is significant difference between mean score of record quality before and after training. Comparison of mean score before and after training shows mean score was increased considerably after training and it reached to 77.45 from 49.93. According to studies by Jafari *et al*. [26].total score of nurse record increased to 0.905 from 0.791 after training DAR approach. As found in the study by Nyknen *et al*. [27] in Finland on 107 records, using SAOPE approach promoted nurse record quality in terms of recording necessary information from 35 percent to 95 percent. Ansari *et al*. [28] studied record writing training with emphasis on problem-oriented medical record approach and investigated training with focus on nursing process and evaluated record writing performance as effective after training intervention. Above findings are consistent with findings by current study. Hence, analysis of research findings indicates training PIE record writing increases nurse record quality in nursing students.

RECOMMENDATIONS

- Comparison of nurse record quality using PIE approach and other record approaches in nursing students
- Comparison of nurse record quality using PIE approach in computer manner and conventional nurse record writing in computer manner by nurses working in hospitals.

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