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The Effect of Medical Recording Training on Quantity and Quality of Recording in Gynecology Residents of Tabriz University of Medical Sciences

Manizheh Sayyah- Melli[1,5*], Malahat Nikravan Mofrad[2], Abolghasem Amini[3], Zakieh Piri[4], Morteza Ghojazadeh[5], Vahideh Rahmani[6]

[1]Departement of Obstetrics and Gynecology, Shahid Beheshti University of Medical Sciences, School of Medical Education, Tehran, Iran
[2]Departement of Nursing, School of Nursing & Midwifery, School of Medical Education, Shahid Beheshti University of Medical Sciences, Tehran, Iran
[3]Department and Center for Educational Research and Development (EDC), Tabriz University of Medical Science, Tabriz, Iran
[4]Department of Medical Records, Tabriz University of Medical Sciences, Tabriz, Iran
[5]Research Center of Evidence-Based Medicine, Tabriz University of Medical Sciences, Tabriz, Iran
[6]Women's Reproductive Health Research Center, Tabriz University of Medical Sciences, Tabriz, Iran

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ABSTRACT

Introduction: Medical records contain valuable information about a patient's medical history and treatment. Patient safety is one of the most important dimensions of health care quality assurance and performance improvement. Completing the process of documentation is necessary to continue patient care and continuous quality improvement of basic services. The aim of the present study was to evaluate the effect of medical recording education on the quantity and quality of recording in gynecology residents of Tabriz University of Medical Sciences.

Methods: This study is a quasi-experimental study and was conducted at Al-Zahra Teaching Hospital, Tabriz, Iran, in 2016. Thirty-two second through fourth year gynecologic residents of Tabriz University of Medical Sciences who were willing to participate in the study were included by census sampling and participated in training workshop. Three evaluators reviewed the residents' records before and after training course by a checklist. Statistical analyses were performed using SPSS 13 software. P-values less than 0.05 were considered statistically significant.

Results: The results showed that before the intervention, there were significant differences in the quantity of information status among the evaluators and no significant difference was observed in the recording of qualitative status. After the workshop, among the 3 evaluators, there were also significant differences in the quantity of data recording status; however, no significant change was observed in recording of qualitative status.

Conclusion: The study findings revealed that a sectional training course of correct and standardized medical records has no effect on reforming the process of recording.

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Introduction

Recording comprehensive, timely and accurate information in a patient's file is an integrative part of patient care to reduce medical errors,[1] improve the continuous quality of provided services and promote community health.[2,3]

Information entered in the medical records is the result of measures taken during the process of diagnosis and treatment of the disease.[4,5] Recording errors are human errors that can have irreparable risks due to changes in the process of patient care and could lead to loss of millions of lives around the world.[6,7]

Common errors include incomplete or incorrect information.[8] Recording errors can create legal problems in subsequent years in problematic cases.[1] In addition to reducing medical errors, correct medical recording helps

***Corresponding Author:** Manizheh Sayyah- Melli, (MD), email: manizheh.sayyahmelli@gmail.com. This study was performed with financial support of research deputy of Shahid Beheshti University of Medical Sciences. (No. 9209)

in evaluating educational activities,[9,10] medical research,[9,11] records for forensic medicine and judicial system, encouragement of patients for self-care, accounting and reimbursement processes.[3] Medical errors affect one in 10 patients worldwide.[12] Reports have shown that as many as one in six of deaths from medical errors in the United States are due to errors in data recording.[13-16] Many articles have been published in relation to medical errors, but there is less information about the record errors and quality of data recording. The high prevalence of medical errors and recording errors increases public concern about the health services provided;[2,17] thus, the subject has been a priority in medical research.[18]

Accurate and comprehensive records are valuable, especially when the required data can be achieved as soon as possible.[8] In various studies, to improve the quality of medical documentation, the following suggestions were made; using speech to text software,[14] the performance of faculty members in the process of medical data recording,[20] using standard patterns,[21] use of information technology,[22] improving the hospital's commitment to clinical documents standards[23] and holding training workshops for physicians to reduce incomplete recording of a final diagnosis in the patient's file.[24] Several studies have shown that case studies alone were not enough to eradicate the documentation errors.[25-29] In these studies, only specific problems with the recording of medical data have been investigated and few studies have been conducted on the education of residents and all aspects of documentation. Also there is a gap on training issues in previous studies.

Although exact statistics of documentation errors are not known in Iran, based on evidence in the field of medical infractions, most complaints are related to obstetricians and gynecologists.[30] Al-Zahra Teaching Hospital in Tabriz, is a Level 3 referral center that covers more than 1,400 inpatient and 11,000 outpatient visits in a month with 19 faculty members and 44 residents who provide educational and medical services. A review of the records of the Department of Obstetrics and Gynecology showed that data recording is faced with quantitative and qualitative problems and the residents did not record the information accurately in the patients' file.

In this regard, we investigated all aspects of documentation errors and evaluated the effect of training medical files recording for the quantity and quality of documentation by obstetrics and gynecology residents at the Tabriz University of Medical Sciences.

Materials and methods

This quasi-experimental study was conducted at Al-Zahra Teaching Hospital, Tabriz, Iran, in 2016. Due to the fact that there was no estimate of population variance and due to limitation of the samples, all residents of the second to fourth year who were willing to participate in the study were included by census sampling and sample size calculation was performed with the Medcalc 2.1 software, with 0.36 effect size, at 5% significance level, power of 0.8 and test and sample loss of 15%. The first year residents and those who were on leave for the delivery or transferred were excluded. After obtaining informed consent, a workshop regarding correct and standard recording was held. At first, the goals of the medical records, documenting content, documentary rules, rules of confidentiality of documents, rules of compulsory reporting and disclosure of secrecy, negligence, forgery and censure, medical system rules, consent, and certification were discussed. Also information cycle of inpatient patients, document ownership and other types of reports were described and good writing principles was explained. After describing the scientific fundamentals of each major parts of the file, they checked the structure of the records in small groups and the documentation problems were summarized and reported. Then, the proper way to record medical orders, preoperative and postoperative care leaflet, writing a progress note or discharge note and other items were explained with the relevant components, and again they evaluated the aforementioned parts in small groups and the recording errors were summarized and

reported. In the last section, communicating skills and familiarity with legal issues was explained and practiced. Then the patients' records of 30 residents were encoded aligned with the name of the resident, and 120 files from the archive of medical records during hospitalization, three months before the study and three months after the training course (four files for each resident) were examined by a checklist.[18] Each file was checked by three evaluator.

The first evaluation was done by the researcher and the second and third evaluation were done by two faculty members familiar with the correct recording of file information.

The Cohen's kappa coefficient was used to assess agreement between evaluators. The kappa coefficient was approximately 91% which indicated acceptable inter-rater agreement. The data from 120 files in terms of general information and quantitative and qualitative recording were examined using descriptive statistics (mean, standard deviation, frequency and percentage). Paired samples'-tests or Wilcoxon Signed Rank Tests, one way ANOVA as well as ANCOVA with adjusting the effect of baseline values were used to compare the mean score changes before and after the intervention and chi square or Mc. Nemar tests were used to compare the frequency of the test using SPSS 13 (SPSS Inc., Chicago, IL). A p- value of less than 0.05 was considered statistically significant. No additional costs were imposed on the patients. Patients' information was kept confidential and the files were identified only by codes.

Results

A total of 32 residents participated in the study and 30 of them entered the final analysis. Tables 1 to 3 show the evaluation results of 120 files of residents of obstetrics and gynecology at the Tabriz University of Medical Sciences in 2016, before and after the intervention by three valuators, respectively. Comparison of the mean and standard deviation of general information, quantitative and qualitative status before and after the training workshop by 3 evaluators is presented in Table 1. After intervention, the mean of general information by evaluator 1 rose significantly compared to the baseline (P =0.001); however, no significant change was seen in the quantitative or qualitative status compared to before the study (P>0.05).

The results by evaluators 2 and 3 are also presented in Table 1. There were no significant changes compared to before the study in the recording of the general information status or quantitative and qualitative status (P>0.05).

The results of evaluation before and after the training workshop among the three evaluators are shown in Table 2 and 3. As shown, there were significant differences in the averages of general information recording status and quantity of information status among the evaluators before and after education (P=0.001); however, no significant change was observed in the recording of qualitative status (P>0.05). Table 4 and 5 demonstrated that there was a performance improvement in some standards.

Also, as shown in Figure 1, the qualitative data recording status did not change significantly before and after the training workshop for three evaluators.

Discussion

It is very important that the health care provider records properly the management of a patient under his care. Poor documentation of medical notes may adversely affects patient management.

Results of medical records by obstetrics and gynecology residents at Al–Zahra Teaching Hospital, Tabriz in 2016 showed that attending only one training course did not have a significant effect on performance in terms of quality and quantity of accuracy and correctness in filling out medical files. The evaluation results showed that training workshop was effective in improving the status of recording of the general and quantitative data, but not qualitative data (P =0.001) and (P=0.24), respectively. Several studies have shown the role of education on

Table 1. Comparison of the general information, quantitative and qualitative status before and after the training workshop (3 evaluators, N= 30)

Variable	Before training Mean (SD)	After training Mean (SD)	P*
General information status			
1	1.34 (0.26)	1.60 (0.31)	0.001
2	2.77 (0.33)	1.61 (0.32)	0.051
3	2.77 (0.33)	2.92 (0.55)	0.20
Quantitative recording status			
1	1.38 (0.25)	1.39 (0.23)	0.91
2	3.63 (0.29)	1.44 (0.31)	0.40
3	3.63 (0.29)	3.57 (0.26)	0.40
Qualitative recording status			
1	1.77 (0.31)	1.91 (0.28)	0.078
2	1.89 (0.27)	1.44 (0.31)	0.40
3	1.89 (0.27)	2.02 (0.29)	0.08

*Paired samples t-test

Table 2. Comparison of the general information, quantitative and qualitative status among the 3 evaluators before the training workshop

Time	Before training			
Variable	Evaluator 1 Mean (SD)	Evaluator 2 Mean (SD)	Evaluator 3 Mean (SD)	P*
General information status	[a]1.34(0.26)	[a]1.46(0.23)	[b]2.77(0.33)	<0.001
Quantitative recording status	[a]1.38(0.25)	[a]1.40(0.27)	[b]3.63(0.29)	<0.001
Qualitative recording status	[a]1.77(0.31)	[a]1.84(0.33)	[b]1.89(0.27)	0.224

*One way ANOVA

Table 3. Comparison of the general information, quantitative and qualitative status among the 3 evaluators after the training workshop

Time	After training			
Variable	1st evaluator Mean (SD)	2nd evaluator Mean (SD)	3rd evaluator Mean (SD)	P*
General information status	[a]1.60(0.31)	[a]1.61(0.32)	[b]2.92(0.55)	<0.001
Quantitative recording status	[a]1.39(0.22)	[a]1.44(0.31)	[b]3.57(0.26)	<0.001
Qualitative recording status	[a]1.91(0.27)	[a]1.96(0.30)	[b]1.02(0.29)	0.241

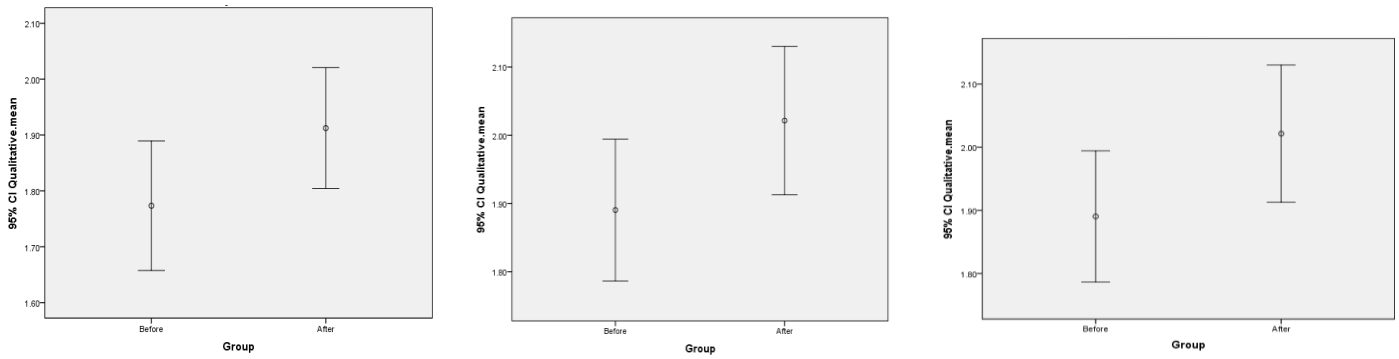
*ANCOA, A Tukey post hoc test showed a significant difference between a and b (P <0.001).

Table 4. Checklist showing the percentage of correct date and time recording before and after the training workshop

Variable	Percentage of observing standards before training				Percentage of observing standards after training				P
	100%	75%	50%	0%	100%	75%	50%	0%	
Recording date	66 (73.3)	16 (17.8)	3 (3.3)	5 (5.6)	46 (51.1)	31 (34.4)	9 (10)	4 (4.4)	66 (73.3)
Recording time (hour)	47 (52.8)	21 (23.6)	9 (10.1)	12 (13.5)	22 (24.4)	25 (27.8)	26 (28.9)	17 (18.9)	47 (52.8)

Table 5. Checklist showing the percentage of recording the standards of quality and quantity of documentation before and after the training workshop

Variable	Percentage of observing standard before training		Percentage of observing standard after training	
	Quantity	Quality	Quantity	Quality
Patient demography	46	46	57	56
Main complaint	67	57	47	58
History of current illness	46	36	55	48
Past medical history	51	59	63	65
Family history	36	47	45	57
Social history	63	27	74	38
Allergies	46	49	57	56
History of medications	52	58	64	67
Obtaining consent forms	96.6	64	100	77
Review of systems	67	57	69	63
Physical examination	57	47	65	56
Laboratory data	45	52	55	66
Reports of diagnostic evaluations	55	43	63	53
The progress notes	46	48	65	56
Writing patient orders	59	46	65	56
Documentation of operative procedures	43	66	46	74
Proper record of drug protocols and medications used	95	76	85	88
Writing on- service note	2	3	0	2
Writing off- service note	2	3	0	2
Entering accurate information in the consultation sheet	100	96	89	98
Correct completion of the file summary	89	47	88	56
Providing accurate informed consent	96.6	75	100	85
Complete the discharge summary	58	54	66	66
Putting information in the wrong place in the file	36	67	47	69
Risk management method in the case of incorrect data recording	45	43	56	65
Doctors full name and the signature with Job category	56	47	54	55
Record mistakes	45	36	44	63
Use of lacquer	34	48	35	65
Reporting the error	30	47	28	58



Evaluator 1 Evaluator 2 Evaluator 3

Figure 1. Comparison of qualitative data recording status before and after the training workshop by evaluator 1, 2, and 3

improving the quality of records. Tan et al., has shown that training with regular feedback can increase motivation and improve the quality of file summary recording.[31] Post-follow-up surgical ward round proforma also improves recording quality.[25] Dolan et al., confirmed the use of proforma in the emergency surgery ward.[32]

The results of our study showed that no off-service notes and no on-service notes were written in any of the cases before and after the training. A common error noted was the entering of information in the wrong place in the file, observed in 47% and 69% of records, respectively, in terms of quality and quantity even after the training (Table 5). Residents, particularly second and even third year residents, did not write the information in the correct place, in front of the titles. They have their own way of recording, which is not useful for restoring or for electronic recording. Alamri et al., introduced a standardized ward round checklist to reduce recording errors in the rounds of surgery wards.[25] Several studies have shown a high prevalence in recording errors and the role of education and feedback.[33-35] In this study, despite the hospital's protocols for prescribing medication based on scientific evidence, from 12 to 24% of these protocols were not met (Table 5). Checking standards of documentation also indicated that residents did not pay attention to these standards and there were still defects in recording history (Table 5). In writing the progress notes after training, the situation improved slightly in terms of quantity (65% vs. 46%); however, the structure was less observed in terms of quality (56% vs. 48%) (Table 5).

Lack of treatment planning for patients at discharge from the hospital has been considered a documentation error.[36] In a study, information about discharge was written for only 74% of patients.[37] In another study, there were errors in electronic file summaries in 13% of cases.[38] In our study after training workshop, the residents wrote the discharge note in terms of quantity and quality in 88% and 56% of cases, respectively (Table 5).

Identifying important factors such as incorrect file contents can reduce factors threatening a patient's life. Talebi et al., showed that primary training of residents and periodic encouragement can be effective in improving the process of recording data.[39] Based on World Health Organization guidelines from 2006, reducing the error rate is a quality goal.[40]

Unlike medical errors having systems to make them clear, there are no interventions for recording errors in education and health systems. Creating a system for reporting incorrect cases is very necessary both for caregivers and the system because people do not usually voluntarily report their mistakes. Hidden injuries occur 300 times more than the incidents.[41] These injuries may lead to irreparable effects.[42]

Recording skills in a logbook may also increase residents' sensitivity to correct recording of files.[26] In our center, logbooks are only used for patient registration and management and are not associated with evaluation and reflection.

Methods such as root/causes or factors/problems graph have been suggested for identifying errors in care to prevent their repetition.[43,44] These models have been used to help service providers reduce medical errors.[45] By entering the correct information in the patient's file, serious complications that lead to mortality, disability or prolonged hospital stay can be reduced. Other studies have also highlighted the education of residents such as periodical e-learning of correct recording of files.[43,46,47]

Also training programs targeting residents often improves educational quality, quality of care, and clinical processes, however, the successful implementation of such programs requires attention, the active participation of students and faculty members, and institutional and systemic factors.[48] The role of knowledge education and skill-based performance in patient care has been proven and should be added to the educational goals of residents' curriculum.[49]

It has also been shown that holding mortality and morbidity conferences can reduce recording errors.[50] Despite these conferences being held monthly at the training center, no changes in filing records are observed by residents. One factor can be a long working time, approximately 32 hours. Studies have shown that long working hours of residents without a break (12-16 hours without sleeping), increase the error rate.[51,27] However, a review study has not confirmed that.[28] On the contrary, it had a negative impact on residents' education.[29]

Despite advances made in the development of data recording quality, unfortunately, the dissatisfaction with and complaints from medical staff are increasing.[52] Medical recording efficiency is not only the indicator of patient care quality, but it represents the knowledge of scientific principles in patient care, considering care standards, the determined health plan, evaluation and care provided.[53]

In fact, failure to record the patient's information would hurt and overwhelm the rights of patients. Moreover, those who have taken actions but have not recorded, these will hurt the patient as well. Because someone else who is unaware of these actions may act similarly in case of risk, which may lead to irreversible complications.[54,55]

It is necessary that timely collection and review of medical records be examined in terms of medical errors before they become permanent records.[56] Since patient care is not simply the responsibility of one person and physicians are responsible for caring of several patients, timely recording of measures taken during patient care is vital.[57]

Some strategies such as primary training for newly arrived residents, qualitative and quantitative control of files, cascading training of correct file recording, positive encouragement and feedback, and periodical evaluation of files have been advocated.[39,58] Farzandipour et al., indicated that only one training course to improve the quality of recording diagnosis is not sufficient.[59]

Some events may not be obvious, but it would lead to incorrect documentation such as communication problems, insufficient number of nurses, various dialects, illegible handwriting, or drugs with similar spelling. The mistake may be caused by the patient herself but more errors are caused by systemic problems.[60]

Also, a study has shown that incorrect recording of medical data in patients' files not only has bad impact on patient care but also had medico legal effects. In this regard, Aamri et al., used a checklist designed to improve the performance of young doctors in ward rounds and concluded that the recording pattern improved.[25]

Patient care is an ongoing process and it is necessary to carry out this process with minimal defects to maintain patient safety. Continuous monitoring of this process system is advocated. Organizing workshops for physicians and setting up executive bases can raise the level of compliance with documented principles in patient records.[61] There are other issues as well. Residents modify their performance in case they are monitored and given feedback. Therefore, faculty members' participation will help improve the quality of recording. In addition, a crowded teaching hospital, with both Level-1 services and Level 3 services, makes it harder to record files properly. Although this may lead to adequacy of educational minimums in terms of quantity in residents of obstetrics and gynecology that is specified in the curriculum and lead to the completion of their log books, the goal will not be achieved in terms of quality.

There were limitations for this study. One limitation was the type of the study that was a single-group design due to the lack of a similar group as a control. Another limiting factor was the impact of several confounding factors, such as high workloads, low numbers of residents, and a referral center. The other limitation was gathering information outside the evaluation period to prevent bias. The type of study and data collection requirements were fully and clearly explained to all the residents participating in this study and written

informed consent was obtained. The records, patient name and the name of the residents were kept confidential and code was used.

Conclusion

The results show that only one training course of correct and standard recording of medical files has no effect on recording process reform in most cases, and our hypothesis did not work in this regard. One of the important factors that can improve the quality of the record is the commitment of leadership to solving systemic problems and reforming the process of designing care processes.

Further studies are recommended around creating the electronic recording system and using a standard template, preparing file recording forms as a checklist to prevent the loss of data, evaluating attending physicians and residents based on medical records, evaluating the effect of reducing work load on the quantity and quality of care by intervening guidance committees in referring patients to non-teaching general centers, evaluating the effect of creating systems for patient safety in hospitals on the quantity and quality of medical records, and increasing the learning of clinical skills and the role of educators in correct teaching of students.

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Ethical issues

None to be declared.

Conflict of interest

The authors declare no conflict of interest in this study.

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