

Original Article

Impact of an educational intervention on medical records documentation

Hojat Sheikhmotahar Vahedi¹, Minasadat Mirfakhrai², Elnaz Vahidi¹, Morteza Saeedi¹

¹ Emergency Medicine Research Center, Emergency Medicine Department, Shariati Hospital, Tehran University of Medical Sciences, Tehran, Iran

² Emergency Medicine Department, Shariati Hospital, Tehran University of Medical Sciences, Tehran, Iran

Corresponding Author: Morteza Saeedi, Email: m_saeedi@tums.ac.ir

BACKGROUND: Inaccurate and incomplete documentation can lead to poor treatment and medico-legal consequences. Studies indicate that teaching programs in this field can improve the documentation of medical records. The study aimed to evaluate the effect of an educational workshop on medical record documentation by emergency medicine residents in the emergency department.

METHODS: An interventional study was performed on 30 residents in their first year of training emergency medicine (PGY1), in three tertiary referral hospitals of Tehran University of Medical Sciences. The essential information that should be documented in a medical record was taught in a 3-day-workshop. The medical records completed by these residents before the training workshop were randomly selected and scored (300 records), as was a random selection of the records they completed one (300 records) and six months (300 records) after the workshop.

RESULTS: Documentation of the majority of the essential items of information was improved significantly after the workshop. In particular documentation of the patients' date and time of admission, past medical and social history. Documentation of patient identity, requests for consultations by other specialties, first and final diagnoses were 100% complete and accurate up to 6 months of the workshop.

CONCLUSION: This study confirms that an educational workshop improves medical record documentation by physicians in training.

KEY WORDS: Medical records documentation; Emergency Medicine; First degree residents

World J Emerg Med 2018;9(2):136–140

DOI: 10.5847/wjem.j.1920–8642.2018.02.009

INTRODUCTION

It has long been recognised that accurate and complete documentation is important in medicine.^[1] International Classification of Diseases (ICD)'s guidelines have announced that diagnostic information should be organized systematically utilizing standardized recording methods.^[2] Nevertheless inaccurate and incomplete medical records remain a worldwide problem. A systematic review showed that many countries have been complaining for incompleteness, inappropriateness and illegibility of records.^[3,4] In recent years, many high level health and safety planning strategies have tried to determine the factors that improve the quality of medical care.^[5] One of the key requirements of high quality

medical care is the documentation of: the patient's health status, the time of entry of all the information about patient's hospitalization, lab tests and imaging modalities needed, the patient's clinical progress, and the availability of family support.^[6]

Instructive interventions have been shown to improve the documentation entered into medical records significantly.^[7,8] The American Health Information Management Association (AHIMA) claims that training programs are one of the most effective ways to improve the documentation process.^[9] It also suggests that; using incentive program, updating and redesigning medical forms, frequently reviewing records and providing physicians with the best and most appropriate time to

access and complete medical records, are the most useful practices to improve documentation.^[9] In Iran, in the last two decades external evaluation systems affected the health care systems seriously. Government, ministry of health, consumer services, insurance companies etc. all are working hard together to meet the world standards of optimal patient care. Accreditation, is one of the modalities to help in this field by improving quality health care services.^[10,11] This study was designed to examine whether a simple educational intervention (i.e., a training workshop) would improve the documentation of medical records performed by PGY1 emergency medicine residents. Our hypothesis is that education can have a positive effect on medical record documentation.

METHODS

Study design

This interventional “before and after” study was conducted in 2015 in Imam Khomeini, Shariati and Sina hospitals. We evaluated the effectiveness of a 3-day-educational workshop for emergency medicine residents on the information required to produce an accurate and complete medical record.

Some of the medical records documented by the residents were randomly selected before, 1 month and 6 months after they attended the workshop and their quality compared.

The principles of documentation taught in the workshop were based on the latest WHO and AHIMA guidelines.^[9] The correct methods of documentation and the necessary parts documented were emphasized in this workshop. This teaching course was instructed by the chief investigator. At the end of workshop, as a practical exam, some old medical files, without the patient’s identity, were evaluated by the participants and all missing or incomplete data were determined and discussed.

Thirty PGY1 emergency medicine residents attended the workshop and participated in the study. Medical records documentation of the same residents were evaluated. The medical records of 300 patients registered by these residents (i.e., 10 records per resident) were collected randomly before holding the workshop, 300 medical records (i.e., 10 records per resident) were selected randomly one month after the workshop, and a further 300 medical records were again randomly selected six months after the workshop. These 900 medical records were then scored by three trained colleagues who were blinded to patients’ and residents’

identities. They checked all the items below and fulfilled a predesigned checklist, like previously described studies.^[5,7,12] Briefly, scoring was performed by using standard checklists that contained yes/no answers to the following questions (Table 1).

Statistical analysis

All data were analyzed by SPSS v.22. For qualitative data the frequency rate and for quantitative data the mean±SD were reported. In order to evaluate the normal distribution of quantitative data, we conducted a Kolmogorov–Smirnov (KS) test. We then performed the independent *t* test to compare our quantitative data, which had a normal distribution, with 95% *CI*. All the descriptive data were analyzed by Chi-Square test. *P*-value <0.05 was statistically significant.

RESULTS

Our study revealed that documentation of most items was improved significantly after the workshop. Data are shown in Table 2. The most accurately documented items before the intervention were patients’ identity, first and final diagnosis and compatibility of medical orders with patient diagnosis.

The most dramatically changed items were: documentation of systematic physical exam both 1 and 6 months after the workshop and documentation of date and time 6 months after the workshop.

Registration of patients’ family history was significantly decreased after the intervention.

Documentation of diagnostic plan and treatment options, lab tests and imaging reports, differential diagnosis, problem list, on service and off service notes were poor both before and after the intervention, thus workshop could not help physicians to augment their

Table 1. The standard checklists

Questions	Answers
File number and patient’s identity	1. Yes 2. No
Time of admission and discharge	1. Yes 2. No
Patient’s chief complaint	1. Yes 2. No
Drug history	1. Yes 2. No
Family history	1. Yes 2. No
Past medical and social histories	1. Yes 2. No
Vital signs’ chart	1. Yes 2. No
Physician signature and stamp	1. Yes 2. No
Diagnostic plan and treatment options	1. Yes 2. No
Lab tests and imaging reports	1. Yes 2. No
Differential diagnosis and problems list	1. Yes 2. No
Progress note	1. Yes 2. No
Systematic physical exams	1. Yes 2. No
On service and off service notes	1. Yes 2. No
Consulting orders with other specialties	1. Yes 2. No
Compatibility of medical orders with patient diagnosis	1. Yes 2. No
First and final diagnosis	1. Yes 2. No

documentation in these items. About the “Compatibility of medical orders with patient diagnosis” and “First and final diagnosis”, the study showed no difference before and after the intervention because their registration was almost complete from the beginning.

DISCUSSION

Medical records are essential for the provision of high quality medical care for patients and legal evidence. The content of these records should be accurate and complete. Education is required so that physicians know what information must be accurately and completely documented in the medical record.^[7,8] This study shows that the quality of documentation was increased significantly after an educational workshop. In this study we found that education could increase the rate of documentation in most components of medical data. The most dramatically observed changes were in the documentation of systematic physical exam both 1 and 6 months after the workshop and also documentation of date and time 6 months after the workshop. It seemed that EM residents did not pay attention to correctly documenting some items like diagnostic plan and treatment options, lab tests and imaging reports, differential diagnosis, problem list, on service and off service notes. Their medical orders had a good and correct compatibility with patients’ diagnosis and first and final diagnosis were accurately documented from the beginning of the study. We observed that 1 month

after the intervention, documentation of some items was a little higher than that after 6 months of the study. The closer to the workshop the results were evaluated, the more positive effect was seen on the documentation rate. Ala et al^[6] in 2014, evaluated medical record documentation in an ED. They reported that details of patient information and physician stamp were recorded in all documents but most of other notes like consent form, surgical notes were less accurately documented. They also showed that nursing notes and documentation were almost complete. Khoshbaten et al^[13] in 2010 also showed that a training workshop had a positive effect on medical record documentation. The same result was observed in multiple other studies.^[14,15] In 2005, Farokhi et al^[16] evaluated the effect of an educational workshop on medical record documentation. They found that documentation of medical history, consult papers, progress notes and other brief reports were significantly improved after the intervention. Tavakoli et al^[14] in 2015 published that the main reason for the low quality of medical records was lack of education. Our study showed that further studies with more expand evaluation in different specialties are needed to confirm the positive effect of education on medical record documentation. This study declared that education could effectively improve documentation specially with repeated and short training intervals. Residents seemed to be more interested in the documentation of some items or they might consider these items more important. For example we found that they ordered and checked lab tests and

Table 2. Comparison of medical records documentation before and after the intervention (Total number of files in each interval=300)

Items	Before workshop	1 month after workshop	6 months after workshop	P-value	95% CI	P-value* 95% CI
Progress note	228 (76.0%)	298 (99.3%)	295 (98.3%)	<0.001		<0.001
Compatibility of medical orders with patient diagnosis	297 (99.0%)	297 (99.0%)	300 (100.0%)	0.6		0.1
First and final diagnosis	298 (99.3%)	297 (99.0%)	300 (100.0%)	0.6		0.2
Consulting order	257 (85.7%)	296 (98.7%)	300 (100.0%)	<0.001		<0.001
Patient identity	273 (91.0%)	290 (96.7%)	300 (100.0%)	0.004		<0.001
Vital signs	206 (68.7%)	272 (90.7%)	268 (89.3%)	<0.001		<0.001
Systematic physical exam	134 (44.7%)	266 (88.7%)	267 (89.0%)	<0.001		<0.001
Chief complaint	235 (78.3%)	263 (87.7%)	266 (88.7%)	0.002		<0.001
Physician signature and stamp	200 (66.7%)	249 (83.0%)	276 (92.0%)	<0.001		<0.001
Drug history	126 (42.0%)	138 (46.0%)	181 (60.3%)	0.3		<0.001
Past medical and habitual histories	47 (15.7%)	109 (36.3%)	85 (28.3%)	<0.001		<0.001
Date and time	74 (24.7%)	63 (21.0%)	269 (89.7%)	0.2		<0.001
Differential diagnosis	51 (17.0%)	59 (19.7%)	50 (16.7%)	0.3		0.9
Problem list	55 (18.3%)	55 (18.3%)	44 (14.7%)	0.5		0.2
On service and off service notes	32 (10.6%)	41 (13.6%)	39 (13.0%)	0.4		0.3
Family history	143 (47.7%)	34 (11.3%)	63 (21.0%)	<0.001		<0.001
Diagnostic plan and treatment options	43 (14.3%)	31 (10.3%)	32 (10.7%)	0.1		0.1
Lab tests and imaging reports						
Lab data	14 (4.7%)	23 (7.7%)	22 (7.3%)	0.1		0.1
Imaging	8 (2.7%)	20 (6.7%)	13 (4.3%)	0.02		0.2
ECG	2 (0.7%)	6 (2.0%)	5 (1.7%)	0.2		0.3

imaging but they did not pay attention to document the reports of them because of inadvertence or laziness or lack of time. There is little previous research addressed the quality of documentation. Some have suggested chart-based educational training while others have recommended using workshops. There are studies^[17-19] confirming that educational intervention can be an effective means of improving providers' behaviour regarding medical record documentation. Farzandipour et al^[20] in 2013, found that one brief educational session was not an effective strategy to improve documentation. Tinsley et al^[19] declared that documentation might be improved by education if it was reinforced with support of faculty and continued feedback to trainees about their charting quality. Our study somehow supported this result and confirmed that 6 months after the intervention some documentation rates faded comparing to 1 month following the educational workshop. O'Brien et al^[21] supported this finding that a documentation was strengthened by relevant feedbacks or reminders.

Limitations of the study

Emergency overcrowding and physicians' burnout are confounding factors in documentation. Our checklist evaluation could not confirm the accuracy of all the data documented in each record. The emergency medicine residents that participated in the study were volunteers and, therefore, may have been more likely to respond positively to the educational workshop than the remainder of their colleagues who did not consent to participate in the study.

CONCLUSIONS

This study confirms that an educational workshop improves medical record documentation by physicians in training. More educational workshops with short time intervals might have a better outcome. Physicians might pay attention more on documenting the items they are interested in or they find them more important. Education can teach them to register all necessary items accurately in the medical files.

Funding: None.

Ethical approval: Not needed.

Conflicts of interest: Each author of this manuscript does not have any conflict of interest.

Contributors: HSV study design; MM data gathering and study design; EV data analysis; HSM critical revision.

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Received May 29, 2017

Accepted after revision November 20, 2017