

ORIGINAL ARTICLE

Effectiveness of a Teaching Module using Simulated Patient, Photographs and Case Scenario in Wound Certificate Preparation by under-graduate Students

Sharija S,¹ Joy S,² Jayaprakash R,³ Raveendran R.⁴

1. Department of Forensic Medicine, T. D. Medical College, Alappuzha.

2. Department of Forensic Medicine, Medical College, Kottayam.

3. Department of Paediatrics, Medical College, Thiruvananthapuram.

4. Department of Forensic Medicine, Medical College, Kollam.

Abstract:

Many mistakes inadvertently made during preparation of wound certificate by doctors could ultimately lead to a miscarriage of justice. As a primary first contact doctor, every Indian Medical Graduate needs to be conversant in the scientific principles of preparation of wound certificate to meet legal requirements. Wound certificates are one of the most compelling medicolegal documents that have far-reaching implications in legal trails of homicides, assault and civil injury cases. It is necessary to strengthen the teaching of wound certificate preparation. This study was conducted with an objective to find out the effectiveness of a designated teaching module when compared with conventional method of lecture class. An interventional study done at Department of Forensic Medicine, in a Medical College with whole batch of Phase II MBBS students. A designed teaching module with simulated patient, photographs and case scenario was prepared to teach wound certificate. Students were divided into 6 major groups and each group again sub-classified into two; the study group was taught using teaching module and the control group using conventional teaching learning methods. Performance of students was assessed after the teaching schedule and statistically compared using unpaired 't' test. Students taught using teaching module performed better compared to students in a conventional method of teaching where the difference was found to be statistically significant.

Keywords: Unnatural deaths; Poisoning; Hanging, Head injury; Multiple injuries; Burns.

Introduction:

In a judgment by honorable High court of Kerala, India (B. Surendran v. E.X. Thomas: M.A.C.A No. 568 of 2008, against the Award Dated 12.04.2007 in O.P (MV) No. 985/1996 of II Addl. Motor Accidents Claims Tribunal), it was stated that “the Tribunal dismissed the claim petition of the appellant only on the basis of the statement in Ext.A8 wound certificate”.¹ The above judgment of High Court of Kerala, India substantiates the importance of a scientifically precise wound certification for the proper administration of justice in a court of law.

Wound certificate is a medicolegal document giving details of the condition of the patient, solicited for legal purposes. In Indian scenario, examination and documentation of injuries is one of the most important and fundamental medicolegal work done by any primary care doctor.² Medical Officer who issues the certificate may be called upon to testify the same before the court.³ Sometimes sufficient care is not shown for preparation of wound certificate. If wound certificate is not prepared properly, Medical Officers may invite adverse remarks from different quarters for obviously unintentional omissions in recording wound certificate. That would lead to miscarriage of justice.⁴ A similar

situation has been highlighted in the above judgment. Forensic medicine is being taught mostly through didactic lectures with a few demonstrations. Conventional method of teaching of wound certificate is followed with theory classes. These are insufficient in generating appropriate skills among doctors.⁵ This conventional mode of teaching might have led to the lack of interest and lacunae in writing wound certificate properly. This compelled educational researchers to look forward for more skill based teaching and training programmes for this subject. Teaching modules of knowledge and skills would be helpful to train our students.

The present study has been conducted with an objective to determine the effectiveness of the teaching module, with simulated patient, photographs and case scenarios to teach wound certificate preparation by undergraduates over the conventional method of teaching. Using multiple choice questions (MCQ) examination and an Objective Structured Practical Examination (OSPE) of preparation of wound certificate.

Material and methods:

Study design: Interventional comparative study.

Study setting: Department of Forensic Medicine.

Study Period: 5 months after Institutional Ethics Committee approval.

Study Population: Undergraduate Phase II Medical Students.

Sampling Method: Random allocation into groups.

Sample size: Whole batch of students (125 students).

Corresponding Author

Dr. Renju Raveendran (Professor)

Email : sharijajp@yahoo.co.in; vasudharenju@gmail.com

Mobile No.: +91 08547393074

Article History

DOR : 23.03.2023 DOA : 29.09.2023

Table 1. Comparison of mean marks obtained for MCQ examination by students of both categories in each group.

Group	Category	n	Mean	sd	t	p
I	Study	11	5.91	0.94	3.406	0.003
	Control	11	4.55	0.93		
II	Study	11	7.27	1.68	2.575	0.18
	Control	11	5.27	1.95		
III	Study	11	8.64	1.36	4.17	<0.001
	Control	11	5.09	1.77		
IV	Study	10	6.4	1.34	1.25	0.238
	Control	10	5.5	1.84		
V	Study	9	6.33	1.00	5.196	<0.001
	Control	9	3.33	1.41		
VI	Study	9	6.1	1.27	4.782	<0.001
	Control	8	3.0	1.41		

Inclusion Criteria: All Phase II medical students of 2018 admission batch were included in the study

Exclusion Criteria: Those students who refuse to give consent

Intervention: Teaching module for wound certificate preparation; including simulated patient, photographs and discussion based on case scenarios.

Study tools: Teaching module, Feedback questionnaire, Intake Proforma.

Data Collection: Study was started only after getting Institutional Ethics Committee approval. In discussion with Head of the Department, other faculties in the department, designed teaching module with case scenario, photographs and a single simulated patient was prepared. Its content and construct assessed by peer review process. Whole batch of Phase II Medical students formed study population. Whole batch consisted of 125 students. The study procedure was explained to them. Informed written consent was obtained from them. None of the students refused to give consent. Students were divided into six major groups according to the roll numbers in the attendance register. Major group consisted of 22 number of students in first three groups and 20 numbers in the next two and 19 in the last group. Among the 125 students 4 could not attend the class due to personal reasons. Each of the six groups were again be sub divided into two groups of equal number of students randomly by envelop method. One group was study group and the other was control group. The control group was taught in the conventional way of mini lecture class for preparation of wound certificate for 30 minutes. The routine class for wound certificate preparation is for 30 minutes in small groups. The study group was taught with the designed teaching module. After the class outcome of intervention was assessed by an objective type question paper consisting of 10 Multiple Choice Questions (MCQ) and an Objective Structured Practical Examination (OSPE) of preparation of wound certificate. Question paper and OSPE code sheet were prepared by the investigator and were validated by faculty and head of the department of Forensic Medicine. Mean marks obtained for each of the tests was calculated and compared. In order to avoid bias of the efficiency of teaching faculty with regard to students' performance different faculties have taken the classes using designed module and the conventional class. A feedback perception questionnaire was prepared to assess the satisfaction of the students. This questionnaire was also peer reviewed.

Table 2. Comparison of Mean marks obtained for OSPE by students of both categories in each group.

Group	Category	n	Mean	sd	t	p
I	Study	11	6.59	0.63	6.032	<0.001
	Control	11	4.18	1.17		
II	Study	11	6.68	0.98	7.4	<0.001
	Control	11	3.95	0.72		
III	Study	11	6.41	1.02	3.23	0.004
	Control	11	5.09	0.89		
IV	Study	10	6.95	0.44	3.992	<0.001
	Control	10	5.70	0.89		
V	Study	9	7.28	0.83	3.782	0.002
	Control	9	5.00	1.6		
VI	Study	9	6.44	1.04	2.941	<0.001
	Control	8	4.8	1.15		

Feedback from students in study group was assessed based on their response to the perception questionnaire.

After the data collection students in the control groups were given class with the prepared module to avoid ethical issues.

Statistical Analysis: Data collected were entered in the prepared intake proforma. Analysis was done using Software Statistical Package for Social Sciences (SPSS) version 25.0. Normality of the data was analyzed by Shapiro Wilks test. The data showed normal distribution; so parametric tests were applied. Continuous variables were expressed as mean, standard deviation (sd), minimum, maximum, median and inter quartile range (IQR). Categorical variables were expressed as proportion. Comparison of quantitative variables were analyzed by unpaired t test. Mean score of marks were compared and significance is assessed using unpaired 't' test. The 'p' value less than 0.05 was considered as statistically significant. Mean score was calculated for each group and for whole batch separately. Also mean score for MCQ tests and OSPE were calculated separately. More than 25% of difference of mean score was considered as significant and effective difference.

Results:

Among the 125 students of 2018 batch, 121 attended the study. They were in six groups. The group wise score of marks obtained in MCQ examination and OSPE are given in table 1 and 2. The difference in marks obtained for MCQ examination in group II and IV are not statistically significant; $p > 0.05$. Considering all groups together the mean mark difference is statistically significant. The marks obtained for MCQ and OSPE are high in the study group and the difference was statistically significant ($p < 0.001$). Most of the students agree that the teaching module is effective.

Discussion:

The wound Certificate is an important medicolegal document which may help to prove or disprove a case in a court of law. It is the legal duty of a doctor to issue an injury report in the correct proforma with scientifically valid terminologies and proper description of injury. Accident cum wound certificate register is a confidential document and should be in the safe custody of the medical officer. All injuries, however insignificant they may appear, should be recorded. Proper, adequate, and complete documentation is very necessary. In the eyes of law, only those

Table 3. Comparison of mean marks obtained for MCQ examination by students in both categories

Category	n	Mean	sd	Minimum	Maximum	IQR*
Study	61	6.8	1.57	4	10	6-8
Control	60	4.7	1.85	0	9	4-6
		t: 6.822		p: <0.001		

*Inter Quartile Range

Table 4. Comparison of mean marks obtained for OSPE by students in both categories.

Category	n	Mean	sd	Minimum	Maximum	IQR*
Study	61	6.7	0.87	4.5	9	6-7.3
Control	60	4.8	1.20	1.5	7	4-5.9
		t: 10.154		p: <0.001		

*Inter Quartile Range

injuries that have been duly recorded in the medicolegal certificate would be legitimately deemed to have been present on an individual's body and considered in the judicial process, whatever not been recorded by the doctor would be considered non-existent. Even old injuries should be recorded. A proper examination and documentation may reveal the nature of the wounding object, the direction of force, the approximate age, character and manner of the wound.⁶

A study was conducted by Karmarkar in a tertiary care hospital with regard to documentation of injuries by resident doctors and other medical staff revealed that there are still some lacunae in documenting injuries. Based on the study it was suggested that teaching of proper wound certificate preparation should be further strengthened at the undergraduate level.⁷ At present conventional method of teaching of wound certificate is followed with theory classes. This conventional mode of teaching might have lead to the lack of interest and lacunae in writing wound certificate properly.

In a study which assessed the effectiveness of modular approach in teaching at university level it has been concluded that modular teaching is more effective in teaching learning process as compared to ordinary teaching methods. The goal of using modules would be to empower medical instructors in transforming teaching – learning ecosystem. It is recommended that the modular approach should be widely used at various levels of education into active, student-centered learning environments.⁸

A teaching module has clear objective, uniform educational contents, clear ways of assessment and evaluation. These modules focus on active learning and are student centric so that they gain maximum understanding and knowledge of the subject.⁹ Modular teaching has been applied in various subjects with great success.¹⁰ Modular teaching is found to be more effective in teaching learning process as compared to ordinary teaching methods. Various studies showed the effectiveness of various teaching modules at university level.⁸ Studies also showed its effectiveness in various other departments in medical curriculum. Chavda P et al. in his study found that modular teaching fares better than didactic method and hence recommended to be used more frequently in community medicine clinical posting.¹¹

The concept of modular teaching in Forensic Medicine is rare. Based on the concept of modular teaching, very few studies were

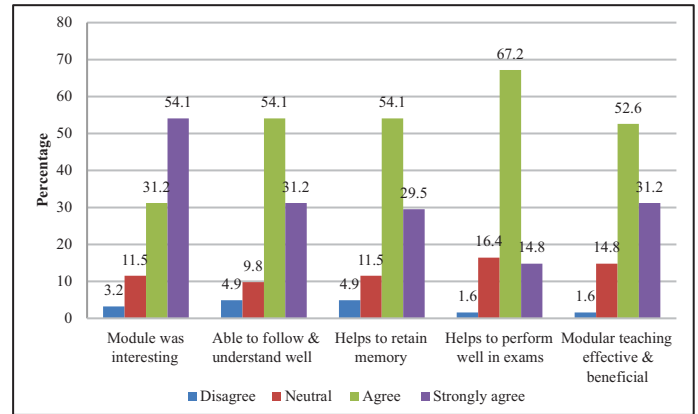


Figure 1. Perception of students in the study group regarding the teaching with teaching module (n=61).

done in Forensic Medicine, especially in India. According to Karthikeyan modular teaching provides knowledge with ample stress on basics through a wide variety of learning activities.¹² Murthy OP has conducted a study on modular teaching for Medico-legal work and modular teaching in Forensic Medicine and Toxicology.⁹ One such study conducted by Kumaran S, using additional teaching module for issuing wound certificate by 2nd year MBBS students was found to be effective. He assessed the effectiveness of an additional modular teaching over conventional method.¹³ But comparison of such new modality with conventional method were not performed. In the present study a new teaching module which included active teaching modalities simulated patient, photographs and case scenarios was prepared for better understanding of wound certificate preparation. Here we have compared the modular teaching with conventional lecture method in teaching wound certificate preparation. Both these showed positive results with modular teaching. Other studies also showed that the additional teaching module along with the existing conventional teaching is more efficacious as compared to either conventional teaching or modular teaching.¹⁴ In the present study, students in the group of modular teaching could score better marks and the difference was found to be statistically significant. In two groups even though there is difference in marks obtained for MCQ examination; but that difference does not show any statistical significance (p>0.05). It could be due to smaller sample size in individual groups.

Regarding the student feedback about the teaching module, 30 to 67% of students think that this teaching module helps them to understand the topic properly, to retain the memory and to perform well in exam. Majority (84%) of students attended the class with teaching module believe that the teaching module is beneficial to them. Faculties also shared that the module is good and easy for teachers to handle classes and easy for the students to remember things well.

Conclusion:

Teaching module used for teaching wound certificate preparation produced better performance of undergraduate students in the examinations. Students also felt that teaching using the module is effective and help them to perform well in exams. Similar

reports modules are more helpful for self study at the learner's pace and during their free time. Modules can be prepared for teaching topics of self study in Forensic Medicine. The modular teaching helps to retain the memory for longer periods and will help them to perform well as an Indian Medical Graduate.

Limitations of the study: Only recent memory was assessed in this study because of shorter duration of study period. Long term retention of knowledge was not assessed. Retention of memory could have been assessed by a second OSPE and MCQ examination a few months later. Further a study has to be done in an elaborated way including many modules and multiple examinations to be conducted.

Implications of the study: Based on the results in this study we are planning to change the method of teaching in our department. There is obvious difference in the marks scored by two groups of students. So, teaching module is a better method to teach some areas of our subject. Modules can be prepared for teaching topics of self study in Forensic Medicine. So that students can study those topics during their free time.

Ethical issues: None.

Source of funding: Self.

Conflict of Interest: None to declare.

Acknowledgements: All faculties, residents and staff of Department of Forensic medicine, Medical College. Sri Anandhu Omanakuttan and all students of 2018 Batch M.B.B.S., Medical College

References:

1. M.A.C.A (Motor Accidents Claims Tribunal) No. 568 of 2008, Against the Award Dated 12.04.2007 in O.P (MV) No. 985/1996 of II Addl. Motor Accidents Claims Tribunal.
2. Modi JP. History of Forensic Medicine. A Textbook of Medical Jurisprudence and Toxicology. 25th ed. Gurgaon: Lexis Nexis; 2017: 3 – 18.
3. Biswas G. Medico-legal Aspects of injuries. Review of Forensic Medicine & Toxicology. 4thed. New Delhi: Jaypee Brothers Medical Publisher; 2019: 302 - 315.
4. Pillai PS. Examination of Injured Persons. Practical Medicolegal Manual. Indian Academy of Forensic Medicine. Trivandrum. 1988: 41- 51.
5. Aggrawal A. Salient Features Regarding Medicolegal Certificate. MAMC J Med Sci. 2015;1:45-51 <http://www.mamcjms.in/text.asp?2015/1/1/45/150068>
6. Reddy KSN, Murthy OP. Medicolegal aspects of wounds. The Essentials of Forensic Medicine & Toxicology. 34th ed. New Delhi: The Health Science Publisher; 2017: 271- 94.
7. Karmarkar, Sapre DP. Documentation of injuries in hospital records-A study. Journal of Indian Academy of Forensic Medicine. 2016; 38(3):287-291 DOI: 10.5958/0974-0848.2016.00072.5
8. Sadia S, Shazia Z. Effectiveness of Modular Approach in Teaching at University Level. Journal of Education and Practice. 2014; 5(17). 103- 10.
9. Murty OP. Modular Teaching in Forensic Medicine and Toxicology. Journal of Forensic Medicine & Toxicology. 2012; 29(1). 1-17.
10. Shafi R, Quadri KH, Ahmed W, Mahmud SN, Iqbal M. Experience with a theme-based integrated renal module for a second-year MBBS class. Adv Physiol Educ. 2010;34:15-9.
11. Chavda P, Pandya C, Solanki D, Dindod S. Is “modular” the way to go for small group learning in community medicine in undergraduate clinical postings? Int J Appl Basic Med Res. 2016; 6(3): 211–14.
12. Karthikeyan K, Kumar A. Integrated modular teaching in dermatology for undergraduate students: A novel approach. Ind Dermat Online Journal. 2014;5(3):266-70. Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4144209/>. Accessed on: 2017 June 25.
13. Kumaran S. Evaluation of the impact of an additional teaching module developed for issuing wound certificate. J Indian Acad Forensic Med. 2018; 40(3). 317-21.
14. Sufiana KM. Effects of modular and traditional approaches on students' general comprehension. Elixir Social Studies. 2012;42:6228-31.