

Formative assessment on documentation of pediatric history taking skills by undergraduate medical students

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Abstract

Introduction: Documenting pediatric history taking is an important competency required of a medical undergraduate student. Feedback is a powerful tool if provided while students are in the process of learning to document history taking. There is insufficient data in medical education to analyze the areas of concern in pediatric history taking. This study was conducted to identify and analyze the areas of concern in Pediatric case sheet writing and to assess the effect of formative assessment on case sheet writing skills. **Methodology:** The study was conducted as a comparative study among sixth semester undergraduate students who underwent Pediatric clinical posting for one month. By the end of first 15 days students were made to interview a standardized patient and document history taking in the case sheet and marks awarded based on a checklist. Their views were collected through a questionnaire. Feedback was provided before the start of next session. The same teaching learning schedule was repeated during the second half of posting and results were analyzed. **Results:** The areas of concern were growth and development (mean 2.76), immunization (mean 2.87), nutrition and personal history (mean 2.92). Analysis of test scores established that formative assessment had a statistically significant positive effect on Pediatric case sheet writing skills ($p < 0.001$). Perception of the students regarding their understanding of various components in history taking assessed through questionnaire is significant following feedback ($p < 0.001$). **Conclusion:** Formative assessment done at periodic interval helps the instructor to assess the students' achievement skills and to identify and correct the concern areas. Structured formative assessment as an educational tool significantly enhances the undergraduate medical students' pediatric history documentation skills.

Keywords: Feedback, Instructor, MBBS, Medical education, Pediatric case record, Standardized patient.

Introduction

Assessment of medical students is an integral part of learning in medical education as assessment drives learning to improve performance of medical graduates in practice. The method and timing of assessment is a challenge for medical instructors. Formative Assessment (FA) is a part of the developmental teaching-learning process as in this type of assessment teachers take a positive approach and employ constructive communication techniques to promote learning and enhance students' academic achievements [1-2]. Timely, relevant and supportive feedback provided during FAs can help identify

appropriate actions to improve learning and contribute to improved learning outcome [3-8]. Productive speaking and writing skills are the important subsets for students where feedback is obtained and measured. Proper clinical history and its precise documentation will enable appropriate and early diagnosis and prompt management leading to better patient outcomes. The format of history taking, case sheet writing and prescription writing is taught in the clinical postings of undergraduate curriculum wherein students imbibe these skills from the teachers and seniors [9-12].

Expertise in history taking and examination skills to arrive at a proper diagnosis is the intended goal for

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the students at the end of the curriculum. Imparting precise case sheet documentation skills and periodic assessment is vital to improve case sheet writing. In the current scenario, medical education programs fails to provide adequate and timely feedback to students on their learning [13]. Hence assessment of clinical competence has shifted from summative assessment to formative learning events [14-15]. No

published case records on pediatric case sheet writing skills was found on literature search. There is a tendency to forget art of writing case sheet though it is taught from the second year in MBBS curriculum in the clinical subjects. So this study was done to identify the critical areas of concern in writing pediatric case sheet and to assess the effect of FA on the performance of students.

Materials and Methods

Aim and Objectives

1. To identify and analyze areas of concern in pediatric history taking skills.
2. To assess the effect of formative assessment on documentation of pediatric history taking skills.

Methodology: This is a comparative study conducted at the Department of Pediatrics, Karpagam Faculty of Medical Sciences and Research over a period of 6 months after obtaining Ethics committee approval and informed consent. 50 students were posted in batches of 10 on rotation for one month duration. In the beginning of posting, a check list was given to ensure proper documentation of Pediatric history taking. Contact classes in the form of small group teaching on history taking, examination and case sheet documenting skills were conducted by the faculty. By the end of first 2 weeks (pre feedback) the students were instructed to interview a standardized patient (SP) and document relevant history within a span of 30 minutes. Simultaneous feedback was collected from the students through a pre structured questionnaire.

The case sheet records were scrutinized based on the checklist and marks awarded. The areas of concern were identified and a constructive feedback was given to the students on one to one basis. The salient points of history taking were re-emphasized during the second half of posting. By the end of second half (post feedback), students were allowed to interview a SP and details recorded within 30 minutes. Post feedback session questionnaire was collected and case sheets were evaluated. Proper care was taken not to divulge the details of SPs prior to the exams. The marks awarded were verified by a senior faculty member in the department of pediatrics. The ability to document a structured case record and feedback was analyzed and the data interpreted using IBM SPSS 22.0 statistical analysis software.

Inclusion criteria: 50 sixth semester MBBS students.

Exclusion criteria: Students not willing to participate and students not having 100% attendance in all sessions were excluded.

Tool Used:

- Written informed consent form.
- Structured questionnaire - pre feedback and post feedback.
- Pediatric case history evaluation check list.

Pediatric case history evaluation check list (Annexure 1): The check list was validated in the department of pediatrics by teaching faculty and was standardized with references from standard pediatric clinical books. The contents of checklist to evaluate case sheet documentation were reviewed, rephrased and necessary changes done to lay emphasis on the patient's perspective (Ideas, concerns and expectations) and the students practice to get relevant information from the patient. The check list was circulated among intended participants at the start of postings and informed consent was taken.

Structured questionnaire (Annexure 2): The questionnaire was based on a five point Likert scale with fixed choice response format designed to measure attitudes/opinions on a linear continuum from strongly agree [5] to strongly disagree [1].

Questionnaire

Name:

Number:

Session:

Please rate the following on a scale of 5 (strongly agree) to 1 (strongly disagree).The information will be used solely by your instructor to assess student satisfaction while the course is still underway.

Components of history taking	Strongly agree(5)	Agree(4)	Neutral(3)	Disagree(2)	Strongly disagree(1)
1.Chief Complaints					
2.Presenting illness					
3.Past history					
4. Family history					
5.Personal history					
6.Growth and development					
7.Immunisation history					
8.Antenatal history					
9.Nutrition history					
10.Socio economic history					
11.Drug history					

12) The time given to document history taking was adequate: yes / No

13) I am satisfied with the quality of my learning experience: Yes / No

14) Feedback during course of study was helpful for my learning: Yes / No

15) The Instructor communicated the aim and objective of session clearly: Yes / No

16) Additional comments for instructor.

Signature of Student

Instructor

Results

50 sixth semester undergraduate students were taken up for the study.

Table-1: Results of pre feedback session questionnaire (n=50).

Component	Strongly agree N (%)	Agree N (%)	Neutral N (%)	Disagree N (%)	Strongly disagree N (%)
Chief complaint	-	19 (38%)	22(44%)	9(18%)	-
Presenting illness	-	7(14%)	19(38%)	24(48%)	-
Past history	-	6(12%)	22(44%)	22(44%)	-
Family history	-	7(14%)	23(46%)	20(40%)	-
Personal history	-	5(10%)	34(68%)	11(22%)	-
Growth and development	-	4(8%)	20(40%)	24(48%)	2(4%)
Immunization history	-	3(6%)	24(48%)	23(46%)	-
Antenatal history	-	6(12%)	25(50%)	18(36%)	1(2%)
Nutrition history	-	3(6%)	24(48%)	22(44%)	1(2%)
Socio-economic history	-	6(12%)	21(42%)	23(46%)	-
Drug history	-	8(16%)	27(54%)	14(28%)	1(2%)

Out of 50 study participants 19 (38%) agreed that they understood chief complaints, 7(14%) for presenting illness, 6(12%) regarding past history, 7(14%) for family history, 5(10%) regarding personal history, 4(8%) for growth and development history, 3(6%) for immunization history, 6(12%) for antenatal history, 3(6%) for nutrition history, 6(12%) for socioeconomic history and 8(16%) regarding drug history. But none of the participants strongly agreed towards any component in history taking. Many participants [21(42%) – 34(78%)] have a neutral opinion regarding all the domains.

Table-2: Results of post feedback session questionnaire (n=50)

Component	Strongly agree N (%)	Agree N (%)	Neutral N (%)	Disagree N (%)	Strongly disagree N (%)
Chief complaint	11 (22%)	29 (58%)	8(16%)	2(4%)	-
Presenting illness	7(14%)	17(34%)	21(42%)	5(10%)	-
Past history	7(14%)	19(38%)	21(42%)	3(6%)	-
Family history	6(12%)	21(42%)	21(42%)	2(4%)	-
Personal history	3(6%)	13(26%)	30(60%)	4(8%)	-
Growth and development	3(6%)	16(32%)	27(54%)	4(8%)	-
Immunization history	3(6%)	22(44%)	22(44%)	3(6%)	-
Antenatal history	6(12%)	20(40%)	22(44%)	2(4%)	-
Nutrition history	1(2%)	18(36%)	26(52%)	5(10%)	-
Socio-economic history	7(14%)	17(34%)	22(44%)	4(8%)	-
Drug history	3(6%)	12(24%)	30(60%)	5(10%)	-

By the end of second half of posting, 11(22%) study participants strongly agreed and 29(58%) agreed that they understood chief complaints. Regarding presenting illness 7(14%) strongly agreed and 17(34%) agreed whereas for past history 7(14%) strongly agreed and 19(38%) agreed. Regarding students' understanding of documentation of personal history 3(6%) and 13(26%) students had strongly agreed and agreed respectively whereas 6(12%) and 21(42%) students had strongly agreed and agreed respectively that they had understood the documentation of Family history. Also 3(6%) and 22(44%) students opined they strongly agreed and agreed respectively that they had understood the documentation of immunization history after the feedback session whereas Antenatal history was strongly agreed by 6(12%) students and agreed by 20(40%) students.

Table-3: Analysis of pre and post feedback session questionnaire (n=50)

Component	N	Mean		SD		Correlation	Sig(p)	't-score
		Pre	Post	Pre	Post			
Chief complaint	50	3.20	3.98	0.72	0.74	0.57	0	-8.125
Presenting illness	50	2.66	3.52	0.71	0.86	0.45	.001	-7.298
Past history	50	2.68	3.60	0.68	0.80	0.54	0	-8.986
Family history	50	2.74	3.62	0.69	0.75	0.54	0	-9.028
Personal history	50	2.88	3.30	0.55	0.70	0.55	0	-4.876
Growth and development	50	2.52	3.36	0.70	0.72	0.58	0	-9.134
Immunization	50	2.60	3.50	0.60	0.70	0.57	0	-10.357
Antenatal	50	2.72	3.60	0.70	0.75	0.55	0	-9.028
Nutrition	50	2.58	3.30	0.67	0.68	0.48	0	-7.584
Socio-economic	50	2.66	3.54	0.68	0.83	0.67	0	-9.920
Drug	50	2.84	3.26	0.71	0.72	0.75	0	-5.957

The perception of the students about understanding various components of history taking is significantly higher in the post feedback session ($p < 0.001$).

Table-4: Analysis of pre and post feedback session marks (n=50)

Component	N	MEAN		SD		Correlation	Sig(p)	't-score
		Pre	Post	Pre	Post			
Chief complaints	50	2.46	3.32	0.64	0.93	0.39	.005	-6.729
Presenting illness	50	2.30	3.06	0.70	0.79	0.55	0	-7.506
Past history	50	2.34	3.24	0.798	0.79	0.60	0	-9.000
Family history	50	2.36	3.12	0.69	0.77	0.68	0	-9.092
Personal history	50	2.08	2.92	0.66	0.77	0.64	0	-9.610
Growth and development	50	1.96	2.76	0.63	0.74	0.66	0	-9.899
Immunization history	50	1.96	2.80	0.62	0.67	0.47	.001	-7.877
Antenatal	50	2.42	3.06	0.70	0.79	0.68	0	-7.568
Nutrition history	50	2.18	2.92	0.59	0.75	0.58	0	-8.269
Socio-economic history	50	2.32	2.98	0.71	0.79	0.73	0	-8.374
Drug history	50	2.42	3.06	0.70	0.71	0.72	0	-8.615

Analysis of pre-feedback session documentation results showed that the minimum and maximum marks scored was 18 out of 55 and 43 out of 55 marks respectively. It is worth noting that in the post-feedback session, the minimum and maximum marks scored was 24 and 48 respectively. In pre-feedback session the documentation of chief complaints (mean 2.46), antenatal details (mean 2.42) and drug history (mean 2.42) were better than other components of history. Whereas in post-feedback session, documentation of chief complaints (mean 3.32), past history (mean 3.24) and family history (mean 3.12) were better. The areas of concern in documenting history in the pre feedback session was that pertaining to growth and development (mean 1.96) followed by immunization (mean 1.96), personal history (mean 2.08) and nutrition (mean 2.18). The areas of concern in the post feedback session was growth and development (mean 2.76) followed by immunization (mean 2.87), nutrition and personal history (mean 2.92). The concern areas were same in the pre and post feedback session. There was significant difference between the test scores in the pre-feedback and post-feedback session ($p < 0.001$).

Discussion

The present study indicate that FA has been effective in promoting learning and writing skills by students and this has resulted in better performance in the exams conducted after feedback sessions. The discussion and sharing of ideas after one to one session at the end of first half of posting provided feedback to students on their performance and mistakes. In these interactive feedback sessions apart from discussing common weakness of all students, specific feedback focused on learner's need was provided with the objective to facilitate closing in their learning gap and make changes for improvement [16-17]. This was accomplished by providing them corrected case sheets with comments on the mistakes done by them [18].

None of the 50 students strongly agreed that they understood all of the components of history taking by end of the pre feedback session whereas many strongly agreed after the post feedback session. Similarly the number of students who agreed has significantly increased after feedback. The number of students who disagree has significantly reduced.

None of them strongly disagreed by the end of second half of posting. Overall 37 (74%) was satisfied with the learning experience in the first session whereas 48(96%) were satisfied in the second session. In the first session 39 (78%) students felt the time given to document history taking was sufficient whereas 48 (96%) felt the same in second session. All the participants opined that teacher feedback on one to one basis was extremely useful to improve their case sheet writing skills and wanted similar sessions to be conducted in other postings too. The difficult areas in history taking in both the sessions were regarding growth and development, nutrition, immunization and personal. It could be because these topics are related in a unique way to pediatrics and not dealt in other branches of medicine as much as in Pediatrics. Regarding chief complaints, past history, family history, presenting illness and antenatal history , the components are same as in other branches of medicine and students have learned previously. There was significant difference between the test scores in the first and second session ($p < 0.001$). Following feedback, case sheet writing and marks

improved significantly in all domains of history taking. Quite often students do not get an opportunity to improve their learning skills as feedback is not imparted hand in hand during clinical postings.

The timing, method and frequency of assessment is a challenge for instructors to produce an ideal Indian Medical Graduate. All assessment formats have both advantages and disadvantages and there is no single standard assessment tool that results in a perfect assessment [19]. In our study, appropriate use of FA with feedback has significant effect on learning activities [20-21]. The results of the teaching activities, questionnaires, feedback session and written examination show that the application of formative assessment facilitates student ability to collect relevant information from the patients and develop appropriate vocabulary and manipulate sentence to properly document history taking [22]. The feedback collected from the students during the process will be used in the forthcoming years to improve teaching learning experience.

On the basis of this study, regular FAs on various topics in the curriculum can be planned for other batches at KFMSR. A possible limitation of our study could be that it was restricted to sixth semester students with small sample size and was done on standardized patients. It is laborious and time consuming for the instructors. Better understanding and cooperation of the students are necessary for improved outcome.

What this study adds: This study explains the need for feedback during the tenure of postings and the importance of conducting the clinical examination in the middle of posting to assess the concern areas of history taking and provide feedback to improve individual performance at the end of posting. This system of evaluation and feedback gives better performance than conducting a single ward leaving exam at the end of the posting.

Conclusion

From this study it is concluded that FA with feedback on documenting Pediatric case sheet writing skills has resulted in significant skill development both subjectively and objectively. It is useful to assess the student achievement skills and also helps them to identify concern areas. It provides them with an opportunity to concentrate their efforts on the problem areas and on the learning process by

providing meaningful learning. FAs improved the case sheet writing skills among sixth semester MBBS students by serving as an educational tool to aid learning. Therefore FAs with feedback during the course of clinical posting results in better outcome than conducting single ward leaving exams in the end.

Contributions of Authors: The topic selection and core methodology was conceptualized by the Corresponding author. Contact classes were taken by first and second authors. Designing of students' feedback questionnaire was done by third author. Preparation of checklist, feedback sessions, preparation of standardized patient, conduct of examination and evaluation of case records were done by first, second and third authors. Statistical Data analysis was done by all the four authors.

Recommendations

1. It is recommended to incorporate formative assessment during the tenure of clinical postings to undergraduate medical students.
2. The faculty of all departments should be sensitized about formative assessment by Medical Education Unit (MEU).
3. Equal importance should also be given to formative assessment for assessment of students' performance in undergraduate medical curriculum.
4. Further studies can be conducted on undergraduate medical students of all batches in the same institution and results can be compared.

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