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Original Article

Evaluation of Peer Presentation in Final Year Rotation of General Surgery

Haris Rashid Shaikh[1]

[1] Professor and Chairman, Department of Surgery and Allied Departments, Ziauddin Medical College, Ziauddin University and Ziauddin University Hospitals, Karachi, Pakistan

***Corresponding author: Haris Rashid Shaikh, Harisrshaikh@gmail.com**

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ABSTRACT

Background: When students give presentations they can be hard to understand and not very relevant to what they're learning. This is a problem in school. The goal of this study was to see if students do a job when they have a specific plan to follow. The researchers looked at two groups of students at Ziauddin University in Karachi. There were 30 students in total with 15 in each group. One group had a plan to follow when they gave their presentations. This plan had four parts that the teachers had come up with. The other group did not have a plan. Just gave their presentations like they normally would. The students listened to each other's presentations. Then filled out a form to say how well they thought the other student did. They used a form with 18 questions to rate the presentations. The researchers added up all the ratings to see how each group did. They used tests to compare the two groups. The results showed that the students who had a plan did a job. Their presentations were clearer and more relevant to what they were learning. They also did a job of talking about the patients symptoms examining the patient discussing possible complications and explaining how to treat the patient. The researchers think that having a plan helps students give presentations.. They need to do more studies to be sure. The main thing they looked at was how well the students presented their education during their surgery rotation. They also looked at how the students worked with each other and how well they could teach each other. Keywords; Peer assessment, structured presentation, medical education, undergraduate surgery, teaching and presentation skills.

INTRODUCTION

Skills in oral presentation and communication form an integral part of undergraduate medical education as they facilitate proper organization of clinical data, presentation of diagnostic reasoning, incorporation of the latest evidence, and constructive participation in academic/clinical discussions. The need for such skills becomes more critical when medical students are involved in surgical rotations since they have to present complex clinical cases in a structured, logical, and clinically relevant way. Unfortunately, although they form an integral part of undergraduate medical education, students usually do not get sufficient guidance regarding the structure of presentation, clinical content, visual organization, and feedback (1).

Peer assessment represents an approach of formative assessment where students assess the performance or work of their peers based on predetermined criteria. When properly constructed, this procedure may encourage active engagement, reflection, familiarization with the criteria of assessment, and more responsibility for learning (2,3). It might be of great help for the raters of the peers' performance as it will make them distinguish good from bad presentation skills and use clear criteria to evaluate them (2,3). The effectiveness of the process will depend on the construction of criteria, organization of the procedure, quantity and preparation of the peer raters, and the consistency of the procedure (4).

Studies done in the field of medicine and health professions have shown that a properly organized set of assessment criteria leads to better organization of the whole procedure, consistency of the process, and perceived fairness of the evaluation (5,6). Structured peer-assessment process may lead to more engagement with the learning goals, better knowledge of the required competencies, and better alignment of the results obtained in peer and faculty assessment (5,6). Such results have also been observed for nursing and dental students who used rubrics in the assessment of oral presentations (7,8,9).

The structured presentation guide is fundamentally different from peer assessment. While the structured presentation guide is the way of organizing what the presenter should say and deliver, peer assessment is the method of evaluating how well that task is fulfilled. A presentation guide containing the necessary background, symptoms, findings, guidelines of management and developments could be helpful for the students to gather information about the subject and deliver it in an appropriate order. Nevertheless, there is no sufficient comparative evidence on the application of a structured presentation guidance within undergraduate surgical rotations, especially in South Asia countries where the strategy of peer-assisted learning can be useful (10).

This research compared peer evaluation scores of the final-year medical students who delivered their presentations based on the structure designed by faculty and those of the students presenting the material conventionally during the general surgery rotation. It was assumed that presentations created according to the structure would receive better scores in presentation-level peer evaluation, especially in the fields of conceptual understanding, clinical information, management guidelines and recent developments.

MATERIALS AND METHODS

This research is a quasi-experimental comparative study that was carried out on the final year students of Bachelor of Medicine & Bachelor of Surgery enrolled for a seven week rotation in the Department of General Surgery at Ziauddin University, Karachi, Pakistan. This research compared the peer evaluation results of structured presentations by the final year medical students to unstructured presentations. The study population consists of all 30 final year students participating in the surgical rotation. Since there was no larger population to draw the sample from, all of the students in this accessible population were taken in the study rather than choosing a different sample from probability sampling. Eligible students for the study had to be enrolled in the final year surgical rotation, have given written informed consent, and had attended at least 80 percent of the sessions during the period of the study.

There were equal number of participants in both the structured-presentation group and the unstructured-presentation group i.e. 15 in each group. The reason for considering this study as a quasi-experiment was that there was no concealment of random allocation as per the manuscript provided. All the students gave one presentation during the rotation period. This presentation was done on the educational material covered during the general surgery rotation.

Students assigned to the structured condition were given a structure of the presentation developed by the faculty in conjunction with the Department of Medical Education and the surgical faculty. The presentation structure mandated that the students organize the presentation in four main parts. The first part involved presentation on the introduction, definition, classification, and fundamental concepts. The second part was on the clinical presentation involving the symptoms, clinical situations, and elective or emergency presentation where relevant. The third part involved the diagnostic evaluation and management according to the latest clinical practice, including examination, investigations, treatment, and complications. The fourth part was on the developments concerning the chosen topic. Students assigned to the structured presentations were allotted 60 minutes, which included about 45 minutes for presentation and 15 minutes for question and answer sessions.

Students who were allocated to the unstructured condition prepared and gave presentations using the traditional approach in teaching undergraduates. The students in this condition did not get the four-part structure of the presentation.

Assessment of peers was conducted immediately after each presentation through an anonymous electronic questionnaire delivered through Google Forms. The questionnaire comprised 18 items falling into five major categories of presentation performance; these categories include content structure and organization, clarity and knowledge delivery, clinical relevance and depth, interaction and engagement, and educational worth in general. These items measured particular aspects like clarity of concepts, inclusion of clinical presentation, relevance of systemic examination, discussion of complications, management based on guidelines, presence of new developments, logic in the sequence, visual representation, speech and body language, teaching aids, interaction, and overall learning. All the items in the questionnaire were measured by the means of five-point Likert Scale, where 1 point meant "strongly disagree," and 5 points meant "strongly agree." Peers had the opportunity to add their comments and define the main message.

The questionnaires were anonymous so that to minimize the bias caused by social desirability and reciprocity issues. The students were advised to assess each presentation according to the given criteria instead of the relationship with the presenter. Electronic responses were checked for completeness prior to exporting the data. The name of the presenter did not enter the analytical dataset. Since more than one peer evaluated each presentation, the repeated assessment approach had to be applied.

The data from the Google Forms were imported into IBM SPSS Statistics v. 26.0 for analyses. Descriptive statistics were run for the number of presentations, number of peer-evaluation forms filled out, the number of ratings received per presentation, and the individual item ratings. Ratings on continuous presentation scales were described as means with standard deviations. Internal consistency of the 18 item assessment was measured using Cronbach's alpha coefficient; this coefficient was interpreted as an item reliability measure and not as inter-rater agreement.

To ensure independence of observations, the ratings of each presenter were pooled to calculate the average presentation ratings on all assessment items. Thus, 30 presentations (15 structured and 15 unstructured) became the independent analytical units to compare the groups. Mean rating scores on all assessment items were compared between the structured and unstructured presentation groups using independent samples t-tests. The effect sizes (Cohen's d) were additionally computed. For statistical significance, two-sided p-values <0.05 were used. As there was more than one presentation domain assessed, item-level comparison was seen as a secondary exploratory analyses, where the pattern, size and direction of group differences were important. The recoding of the original ratings into categorical data and subsequent duplicate chi-square tests were not conducted as part of primary data analysis since the latter is based on the loss of information and cannot fix the problem of dependent observations.

Potential sources of bias included the inability to blind students to the presentation format, variation in presentation topics, differences in prior presentation experience, and the possibility of interaction between students in the two groups. The use of an anonymous standardized assessment form, common rotation setting, equal group sizes, immediate post-presentation data collection, and presentation-level aggregation of repeated peer ratings were used to improve consistency and reduce avoidable analytical bias.

The study got the go-ahead from the ethical review committee. The steps taken followed the rules set out in the Declaration of Helsinki. People who took part did so on their choice. They gave written permission before they joined. Students were told that whether they took part or not would not change their school grades. The answers, from the people who evaluated each other were kept secret. Treated with privacy during the whole time data was collected and looked at.

RESULTS

All 30 student presentations were included in the analysis, comprising 15 presentations delivered using the structured format and 15 delivered using the conventional unstructured approach. A total of 140 peer-evaluation forms were completed, with 70 evaluations obtained for each presentation group. Each presentation received approximately four to five peer evaluations, corresponding to an overall average of 4.67 evaluations per presentation. The 18-item peer-evaluation instrument demonstrated high internal consistency, with a Cronbach's alpha of 0.949 (Table 1).

Table 1. Study Sample, Peer-Evaluation Responses, and Instrument Internal Consistency

Parameter	Overall	Structured Group	Unstructured Group
Student presentations, n	30	15	15
Peer-evaluation forms, n	140	70	70
Mean peer evaluations per presentation, n	4.67	4.67	4.67
Assessment items, n	18	18	18
Likert-scale range	1–5	1–5	1–5
Cronbach's α	0.949	—	—

Mean presentation scores of structured group were found greater than unstructured group for all five domains where numeric scores could be reported. The biggest difference between groups was found in management of cases according to guidelines, where the structured group scored mean score of 4.58 ± 0.49 whereas unstructured group scored 3.74 ± 0.67. This generated difference of 0.84 points (95% CI: 0.40-1.28; p<0.001) with a large effect size (Cohen's d = 1.43).

Structured presentations also received better mean scores in terms of discussion of complications, having scored a mean of 4.59 ± 0.50 versus 3.81 ± 0.64 for the unstructured group, resulting in a mean difference of 0.78 (95% CI: 0.35–1.21; p < 0.001) with large effect size of 1.36. In relation to having included a systemic examination, structured presentations again scored better with a mean of 4.45 ± 0.48 against 3.70 ± 0.68 for unstructured, resulting in mean difference of 0.75 (95% CI: 0.31–1.1

Structured group participants were also more likely to receive higher scores for the inclusion of clinical presentation and clarity of concepts in the presentation level. Participants in the structured group had a mean score of 4.49 ± 0.55 and 4.52 ± 0.51 for inclusion of clinical presentation and clarity of concepts, respectively, compared to the unstructured group which had a mean score of 3.82 ± 0.60 and 3.88 ± 0.65, respectively (a mean difference of 0.67 and 0.64 points, respectively) (Table 2).

Table 2. Presentation-Level Comparison of Peer-Evaluation Scores Between Structured and Unstructured Presentations

Assessment domain	Structured, n=15 Mean ± SD	Unstructured, n=15 Mean ± SD	Mean difference	95% CI	t-value	p-value	Cohen's d
Clarity of concepts	4.52 ± 0.51	3.88 ± 0.65	0.64	0.20–1.08	2.99	0.006	1.10
Clinical presentation included	4.49 ± 0.55	3.82 ± 0.60	0.67	0.24–1.10	3.19	0.004	1.16
Relevant systemic examination	4.45 ± 0.48	3.70 ± 0.68	0.75	0.31–1.19	3.49	0.002	1.27
Associated complications discussed	4.59 ± 0.50	3.81 ± 0.64	0.78	0.35–1.21	3.72	<0.001	1.36
Management according to guidelines	4.58 ± 0.49	3.74 ± 0.67	0.84	0.40–1.28	3.92	<0.001	1.43

For the five completely reported domains, the mean between-group difference was found in the range of 0.64-0.84 points out of five, and the standardized effect size was 1.10-1.43. The direction and size of these effect estimates always favored the structured presentation format. The most significant between-group differences occurred for the clinical topics, especially for the management according to the guidelines, complication, and systemic examination. This suggested the positive effect of the structured presentation format on the completeness of clinical topics and conceptual organization of presentations.

The pairwise comparisons of the logical order of slides, speech and posture, use of teaching materials, recent advances, presentation visual design, interaction, audience engagement, and other items of the instrument used for this study have not been included into the principal results table, since the complete set of mean values and standard deviation of each group was not obtained for their presentation-level

reanalysis. The chi-square analyses previously performed have not been used because the classification of Likert-type responses has lost its original meaning and has not considered the nested data structure.

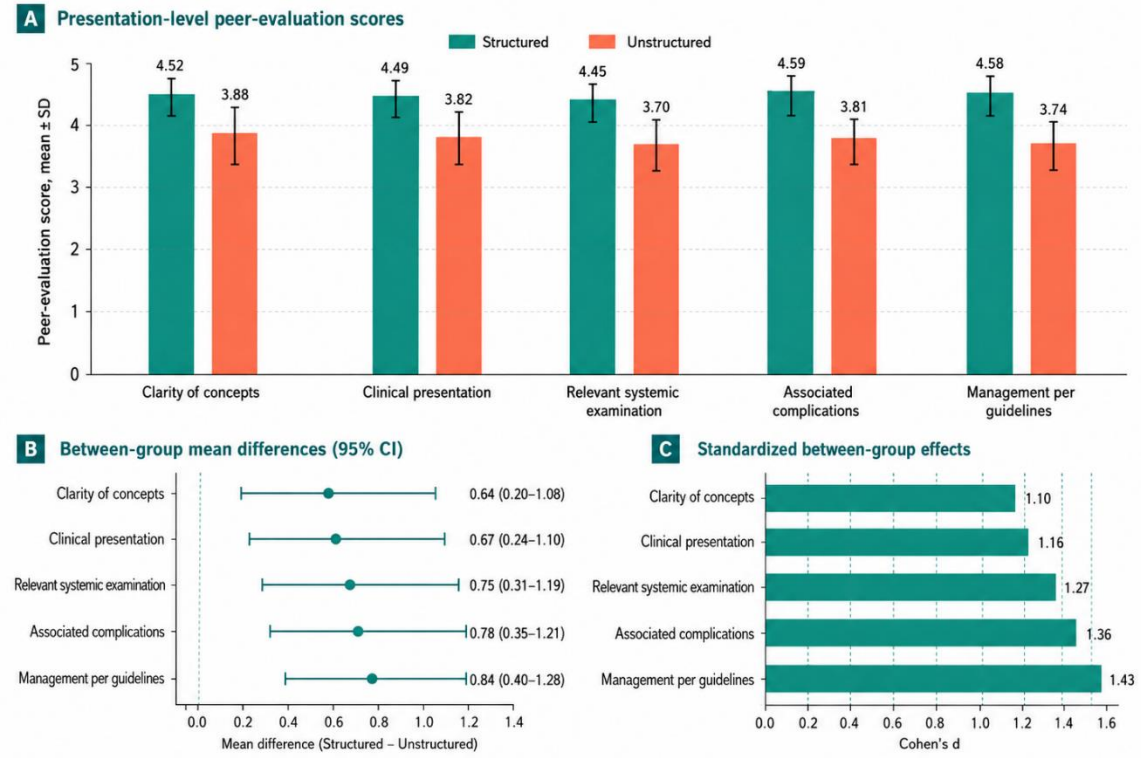

Figure 1. Presentation-Level Comparison of Structured and Unstructured Student Presentations During a General Surgery Rotation. Panel A presents mean peer-evaluation scores with standard deviations for 15 structured and 15 unstructured presentations. Panel B displays the between-group mean differences and corresponding 95% confidence intervals, with positive estimates favouring the structured-presentation group. Panel C presents standardized mean differences calculated using Cohen's d and the pooled standard deviation. CI, confidence interval; SD, standard deviation.

DISCUSSION

The present study has revealed that the final-year medical students that employed the structured presentation framework for their presentations during the general surgery rotation achieved better presentation-level peer evaluation scores compared to those that followed the conventional unstructured method. The differences in scores have been noted consistently for the five domains fully analyzed in the present study, with the greatest difference recorded in the domain of management in accordance with guidelines, complications associated with the disease under discussion, and inclusion of a systemic examination relevant to the case. The structured group of students has also scored higher on the two additional domains related to clarity of concepts presented by the students and inclusion of the clinical presentation. These results suggest that structured guidance in terms of organization and clinical information included in the presentations is linked to improved presentation performance of the students.

The results obtained are consistent with the principle of education stating that structured guidance could serve as an aid in organization and cognition for the learners. Through the specification of the key aspects that should be discussed in the presentations, the structure could lower the degree of uncertainty with respect to the content and order of its presentation by the students, thus allowing them to focus on clinically relevant information such as the examination findings, complications, evidence-based management, and new developments in the field.

The strongest between-group difference was observed for management according to guidelines. This finding may reflect the explicit requirement for students in the structured group to include diagnostic evaluation and management according to current recommendations. Students in the unstructured

group were not provided with the same predefined sequence or content expectations. The structured framework may therefore have functioned as a checklist that encouraged students to include clinically important material that might otherwise have been omitted. Similar educational approaches have been used to direct learners toward core competencies and improve alignment between teaching activities and expected outcomes (13).

The structured group also received higher scores for discussion of associated complications and inclusion of relevant systemic examination findings. These domains require students to move beyond basic definitions and present clinically integrated information. A predefined framework may have encouraged a more systematic transition from background knowledge to clinical presentation, examination, complications, and management. The differences therefore appeared to be greatest in domains that depended on clinical organization rather than presentation style alone. This interpretation was supported by the original manuscript's observation that some stylistic domains, including speech and posture, logical slide order, and use of teaching aids, did not demonstrate clear between-group differences.

Peer assessment may have contributed additional educational value by encouraging students to evaluate presentations according to explicit criteria. Students acting as peer assessors are required to identify relevant content, judge the completeness of a presentation, and compare observed performance with expected standards. This process may promote reflective learning and greater familiarity with assessment criteria (14,15). However, the present study evaluated peer ratings of presentations and did not directly measure the learning gained by the students who provided the ratings. The findings should therefore not be interpreted as evidence of improved knowledge retention, clinical competence, or examination performance.

The high Cronbach's alpha observed for the 18-item instrument indicated strong internal consistency among the assessment items. This finding suggested that the items were measuring related aspects of presentation performance. However, Cronbach's alpha did not establish agreement among individual peer raters. Inter-rater reliability would require a separate assessment using an intraclass correlation coefficient, weighted kappa, or generalizability analysis. Future studies should therefore distinguish between internal consistency of the questionnaire and consistency of scoring across peer evaluators.

Several limitations should be considered when interpreting the findings. First, the quasi-experimental design and absence of a clearly documented concealed random-allocation process limited causal interpretation. Although the groups were equal in size, unmeasured differences in previous presentation experience, academic performance, confidence, language proficiency, or topic difficulty may have influenced peer ratings. Second, students and peer evaluators could not be blinded to the presentation format, creating a risk of expectation and performance bias. Third, the structured condition differed from the unstructured condition in more than content sequence alone because it also included standardized expectations, faculty-developed guidance, and defined presentation timing. The observed differences therefore could not be attributed exclusively to structural organization.

The statistical analysis also required careful interpretation. Multiple peers evaluated each presentation, meaning that the individual peer forms were not independent observations. The revised analysis addressed this issue by aggregating peer ratings at the presentation level and comparing 15 structured with 15 unstructured presentations. Nevertheless, the available summary data did not permit modelling of individual rater effects or variation in the number of evaluations received by each presenter. A mixed-effects analysis based on the original participant-level dataset would provide a stronger approach by accounting simultaneously for clustering within presentations and repeated ratings by individual students.

Various presentation domains were investigated in the study, raising the threat of spurious results due to multiple comparisons. Despite the positive associations and large standardized differences between

the presentation domains, these results must be viewed as exploratory due to the absence of a single primary outcome which had been prospectively defined in the study and due to the lack of multiplicity correction in the analyses.

The research was carried out among a single final year general surgery rotation within one single institution. The sample size was quite limited and consisted of only 30 presentations. Therefore, the results cannot be generalized to other institutions, fields of medicine, academic stages, or education environments. Moreover, the results were not measured in terms of objective evaluations of knowledge or clinical skills of the students or by faculty members, but through peer evaluations.

Although there were many constraints in conducting the research, the study possessed many advantages. It was carried out on an educational intervention that is realistic in terms of an authentic clinical setting, where it involved all students undergoing the particular rotation program, equal group sizes were considered, immediate feedback was provided right after each presentation, and a standardized scale with 18 items was used in the process of evaluation. Moreover, the study exhibited a pattern in clinically significant areas of discussion, rather than just making use of a single comparison. This structured format could be a potential method in helping to enhance the organization of students' presentations, yet it needs to be validated through a more effective methodology.

CONCLUSION

The use of a structured presentation framework during a final-year general surgery rotation was associated with higher presentation-level peer-evaluation scores than the conventional unstructured approach, particularly for clarity of concepts, clinical presentation, relevant systemic examination, discussion of complications, and management according to guidelines. These findings supported the use of explicit organizational and clinical-content guidance as a potentially useful educational strategy for undergraduate surgical presentations. However, the results represented peer-rated presentation quality within a small, single-institution quasi-experimental study and should not be interpreted as definitive evidence of improved knowledge, clinical competence, or long-term learning.

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