



UTILITY OF INTERACTIVE TEACHING OF BLOOD TRANSFUSION PROCEDURE AMONG SECOND YEAR M.B.B.S. STUDENTS.

Pathology

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ABSTRACT

In this cross-sectional educational study, 54 students (31 males: 57.4 % and 23 females: 42.6%) second-year MBBS gave written informed consent for participation in the study. The topic of blood transfusion procedure was taken for the whole batch by interactive lecture on Blood transfusion procedure with power point presentation , Videos and case based examples as well as Case based group discussions. Pre and Post tests were conducted . After three months, same test was conducted suddenly and analysis was done. There was a statistically significant difference in the scores of correct answers of Pre and Post test ($p = 0.000 < 0.05$) suggesting effectiveness of interactive teaching in the participants. However, on follow up with 41 participants after 3 months , there was no significant difference in the scores of Pre-test and 3 month Post test ($p = 0.213 > 0.05$) which implies that knowledge of teaching on Blood Transfusion process did not remain effective after 3 months.

KEYWORDS

Blood transfusion procedure, interactive teaching

INTRODUCTION:

Mark Friedman has stated that lack of knowledge regarding transfusion medicine among clinician is possibly the major obstacle in making transfusion practices more consistent. [1] Thus training in blood transfusion medicine can be initiated in M.B.B.S. curriculum to close the gap in clinician's knowledge. Many countries are lacking blood transfusion training in their medical curriculum. [2]

For rational use of blood and blood products, medical students must have knowledge & skill to apply it practically. Indeed, the lack of knowledge can endanger life of the patient. Although, there is need of continuous knowledge transfer in transfusion medicine, less is known about scope of education provided to medical students. [3] The direct educational intervention is needed in undergraduate curriculum to ensure the impartment of knowledge of appropriate use of blood and blood products & to avoid or minimize transfusion related adverse effects in the patients. Theoretical and practical trainings can be planned in the curriculum to make competent medical graduates. Hence we decided to study the effectiveness of interactive teaching of blood transfusion procedures & appropriate use of blood and blood products to second M.B.B.S. students

MATERIAL & METHODS

This cross-sectional educational study was conducted over a period of three months, in the year 2018, on second-year MBBS students in the Department of Pathology of a Municipal Medical College in a Metropolitan area, Maharashtra. After obtaining prior permissions from the Institutional Review Board & Institutional Clinical Ethics Committee, the written informed consent was obtained from students who were willing to participate in the study.

Total 54 students (31 males: 57.4 % and 23 females: 42.6%) second-year MBBS students gave consent .The topic of Blood transfusion procedure was finalized. Pre-test (Pre-validated) was administered. After taking informed consent, the topic was taken for the whole batch by interactive lecture on Blood transfusion procedure with power point presentation , Videos and case based examples as well as Case based group discussions. Post-test conducted at the end of lecture and case based group discussion. Feedback from students was obtained. After three months, same test was conducted suddenly and analysis was done. However, only 41 students out of 54 students could attend the session as this was a surprise session .

RESULTS:

According to the pre-tested questionnaire given to the participants,

researcher has assessed the answers given by participants and score of correct answers has been taken for the analysis. The scores of participants were entered in Microsoft Excel (Microsoft Corporation, Redmond, WA, USA) and analyzed using SPSS statistical software Windows Version 20.0 (IBM Corporation, Armonk, NY, USA). The paired t-test and Z test for comparison of proportion has been used to test the significance of differences in the various scores. Also box-plot has been used to check the distribution or pattern of pre and post test scores.

At the level of significance 0.05, Paired t-test was conducted to compare pre- test and post-test scores of correct answers of pre-designed questionnaire. Result shows that ($p = 0.000 < 0.05$) there is a highly significant difference in the scores of correct answers of pre & post test. (Table 1). This implies that the teaching on safe Blood Transfusion process was effective for this group of participants.

Table 1: Paired difference between pretest & post test scores of correct answers

Pair (size 54)	Mean	N	Std. Deviation	Std. Error Mean	Paired difference at LOS 0.05			
					95% CI	T value	Df	p value
Pretest&	6.9259	54	1.87186	0.33307	-5.17 to -3.83	-13.511	53	0.000
Posttest	11.4259	54	1.66656					

After 3 months researcher has taken the follow-up session of 41 participants. Hence pre-test score and follow-up score of correct answers has been compared for 41 participants. Table 3 shows that by applying Paired t-test on pre- test and follow-up scores of correct answers of 41 participants, result shows that ($p = 0.213 > 0.05$) there is a no significant difference in the scores of correct answers of pre & follow-up test. (Table 2). This implies that the knowledge of teaching on safe Blood Transfusion process did not remain effective after 3 months.

Table 2 : paired difference between pretest and followup scores after 3 months

Pair (size 41)	Mean	N	Std. Deviation	Std. Error Mean	Paired difference at LOS 0.05			
					95% CI	T value	Df	p value
Pretest&	7.0000	41	1.92354	0.50092	-1.64655 to 0.37825	-1.266	40	0.213
Follow-up	7.6341	41	2.22212					

Further the questionnaire was analysed by grouping particular questions into 4 domains like Bedside practice, Blood safety, reaction identification and Transfusion Indication. On evaluation of responses

of proportion of correct answers of these four domains, difference between pre-test score and post-test score was statistically significant ($p < 0.05$) except for reaction identification domain. It was observed that post test score for correct answers were more high in transfusion indication domain followed by bedside practice as compared to pre test scores for correct answers whereas slight difference was found in reaction identification domain. (Table 3) The average pretest score was 43.3 which improved to 70.3 in post test after interactive teaching.

Table 3 : Difference between pre and post test scores of various domains

Domain	Proportion 1# Pre test	Proportion 2# Post test	p-value	Significance
Bedside Practice	60.00	87.04	0.00148	significant
Reaction Identification	28.4	38.27	0.27572	Not significant
Blood Safety	53.2	78.70	0.00528	significant
Transfusion Indication	31.48	77.16	<0.00001	significant
Average	43.3	70.3		

Boxplot was used to check the distribution of scores of pretest, post test and follow-up scores. Figure 1 and Table 4 showing that there is a significant improvement in measures of central tendency (median) scores in Post test scores as compared to Pre test scores. However there is slight significant improvement in the follow-up scores which has taken after 3 months of pre test.

Figure 1: Boxplot for the assessment of scores

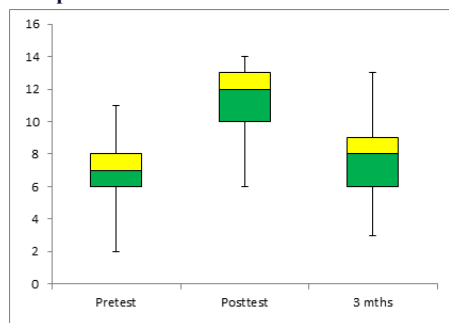
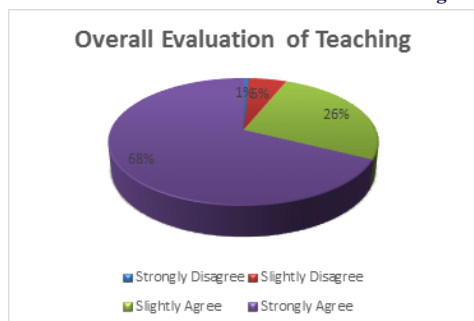


Table 4 : Box-plot measures

	Pre-test Correct score	Post-test correct score	Follow-up correct score
Max	11	14	13
Q3	8	13	9
Med	7	12	8
Q1	6	10	6
Min	2	6	3

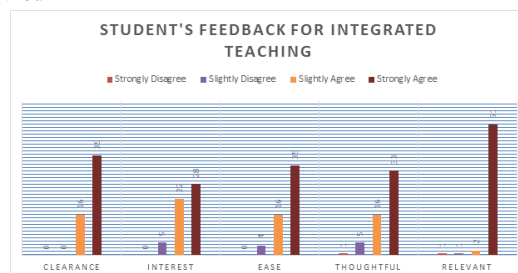
Teaching of blood transfusion procedure was assessed by participants on the basis of various components like clearance, interest, ease, thoughtful and relevance of content of lecture. Evaluation of Sector diagram is showing 68% participants are strongly agreed with the different components of teaching method. With the help of designed questionnaire, 93.81 % participants were satisfied with overall interactive teaching of blood transfusion procedure. (Fig- 2)

Figure 2 : Pie chart for evaluation of interactive teaching



While taking the feedback of participants it was observed that participants were strongly agree on various components of feedback. Relevance of the content was more accepted by students. (Figure 3)

Figure 3 : students feedback regarding overall interactive teaching method



DISCUSSION:

Very few studies have assessed the knowledge of interns involved in blood transfusion but there are no studies for assessing knowledge of medical students. In Kaur and et al study, they found gross disparity in the knowledge of interns involved in transfusion practices. After training, there was significant change in the knowledge regarding indications of components, cross match procedures, storage & shelf life of components, bedside practices and transfusion reactions management.[4]

Reza et al assessed the knowledge of health care workers about blood transfusion methods and 26.2% of health care workers had low level knowledge, 22.2% moderate, and 51.6% acceptable knowledge which points towards need for curriculum to promote blood transfusion knowledge.[5]

As a medical graduate, a doctor must possess adequate knowledge regarding transfusion indications, blood safety, bedside practices & blood transfusion reaction identification. In India, majority of medical colleges teach transfusion medicine to undergraduate students by didactic lectures only, which at times become boring to students. There is no further scope for checking retention of knowledge after interval of time.

The present study was an attempt to teach transfusion medicine by interactive ways like PowerPoint presentation with videos & case base discussions. With the help of designed questionnaire, 93.81 % participants were satisfied with overall interactive teaching of blood transfusion procedure. (Fig- 2). Relevance of the content was more accepted by students (Fig- 3). A study by shenwai reported that 79% of students liked and enjoyed interactive lectures which is comparable to our study. [6] As traditional or didactic lectures lack interaction and students frequently remain passive recipients of information. [7] Interactive lecturing by using various methods like case based discussions, MCQs helps in active learning with increased participation by the students.[8] There are various additional advantages like better understanding, more retention, better reproducibility, clarification of doubts, developing problem solving, decision making attitude and communication skills. [9,10] However, interactive teaching needs a lot of planning with effective time management for it to be successful.

A study from Jordan observed average knowledge of blood and its components in nurses. The pre- training questionnaires about blood transfusion showed average pre- training score of 51.3 %. In our study, average Pre- training score (Pre test score) (Table 3) was 43.3% which is comparable to Jordanian nurses study.[11] which shows need of training for healthcare workers.

Though the interactive teaching was effective, but after 3 months very less knowledge was retained by participants (Table 1 and Table 2). The reason may be the time span of 3 months which is sufficient for forgetting the knowledge. We can suggest repeat such sessions after 1 month with practical visits in the blood bank for observation of various processes which will reinforce the knowledge and retention. As undergraduate students are not expected to perform blood transfusions and manage complications, they can observe it during their clinical postings.

There should be significant improvement in student's knowledge in transfusion medicine. There is no fixed minimum teaching schedule mentioned in the undergraduate curriculum. There are different ways suggested to continuously evaluate knowledge and skills like ongoing monitoring of clinical practice outcome through hemovigilance

programs and in-hospital audits which can be possible during internship and residency.[12]

CONCLUSION:

The study results showed that interactive teaching method does have a significant and beneficial impact on participants (students). However, follow-up scores were not showing significant improvement. Hence periodic interactive sessions can be recommended to all students for safe blood transfusion.

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