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Three-way summaries as a teaching–learning tool: Student perspective and impact on retention of learning

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Abstract:

BACKGROUND: “Three-way summaries” (TWS) are a teaching–learning tool in which students respond to a question or topic inquiry by three different summaries (10–15 words, 30–50 words, and 75–100 words). The aim of this study was to introduce TWS, to establish its impact on learning retention, and to identify students’ perception for TWS.

MATERIALS AND METHODS: It was an educational interventional study. It was carried out in two randomly allocated groups, Group A having TWS as intervention and Group B without TWS, followed by crossover of the groups. Participants were assessed using two multiple choice question (MCQ) tests, ten marks each (one immediately and second after 1 week) during both phases. Students’ perception regarding TWS was assessed by questionnaire using Likert scale. Statistical analysis was done by two-tailed independent t-test.

RESULTS: Both groups’ performance deteriorate after 1 week, but it was affected more in Group B without TWS (4.85 ± 1.89 – 4.70 ± 2.05 , $P = 0.05$) as compared to Group A with TWS (5.30 ± 1.81 – 4.63 ± 1.90 , $P = 0.69$). While in second phase, performance of the Group B with TWS improved more significantly (5.92 ± 2.24 – 6.83 ± 2.21 , $P = 0.04$) in comparison with Group A without TWS (4.96 ± 1.89 – 5.66 ± 2.35 , $P = 0.09$). Most of the students liked TWS as an educational tool using Likert scale (72%–86% agreeing and strongly agreeing).

CONCLUSIONS: TWS is highly acceptable teaching–learning tool which improves learning retention.

Keywords:

Retention of learning, teaching–learning tool, three-way summaries

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Introduction

Black and William (1998) interpreted formative assessment as encompassing all those activities undertaken by teachers, and/or by their students, which provide information to be used as feedback to modify the teaching and learning activities in which they are engaged.^[1] The intention of the formative assessment is to give feedback, promote mastery of content, sharpen skills, change attitudes, and

encourage student growth.^[2] Formative assessment consists of tools that provide feedback to students and/or teachers to help students learn more effectively.^[3] It can be done in variety of ways such as student journals, exit/enter slips, graphic organizers, think-pair-share responses, and classroom discussions.^[4] Formative assessment methods can be utilized as tools for learning by motivating students to learn and by making self-aware of their learning, thus contributing to their learning process.^[5] Three-way summaries

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or 3-way summaries (TWS) are a unique type of formative assessment tool in which students work in group or individually and respond to a question or topic inquiry by three different summaries (10–15 words, 30–50 words, and 75–100 words). It can be an effective formative assessment tool cum teaching–learning tool as it let student to think about the topic in different levels of depth. There is a scarcity of literature in relation to this type of teaching–learning tool. It may trigger different levels of thinking processes in students as they are writing the different types of summaries instead of writing the brief summary at the end. It would be interesting to find out the student perspective about the tool and also its impact on learning retention as it involves different levels of thinking.

The aim of this study was to improve learning by implementation of TWS as a teaching–learning tool in lectures. Objectives of this study were to introduce TWS after lectures, establish impact on learning retention using TWS, and to identify students’ perspective for TWS.

Subjects and Methods

An interventional comparative study was carried out at the pharmacology department. It was carried out in time span of 6 months. Total 130 students of third-semester MBBS students were included in the study. Brief methodology of this study is shown in Figure 1.

Ethical approval was taken from institutional ethics committee, and written informed consent was taken from all participants. Departmental meeting was held in the department of pharmacology to discuss about the project. Two topics were selected for two phases of the project: (1) antigout drugs and (2) vasodilator peptides. Total four multiple choice question (MCQ) test papers (two tests for each topic and ten marks each) were prepared using Google Forms. They were validated by three pharmacologists from the department. Students were sensitized about the study during a lecture. They were taught how to write TWS.

The study population was randomly divided into two groups (Group A and Group B) after completion of the lecture on antigout drugs. Group B was asked to move to the other hall for carrying out ten-mark MCQ test. At the same time, Group A was requested to write TWS on their own words for 15 min. The same MCQ test which was conducted for Group B was carried out for Group A immediately after writing TWS. Another ten-mark MCQ test was carried out for all the participants after 1 week of the lecture (antigout drugs).

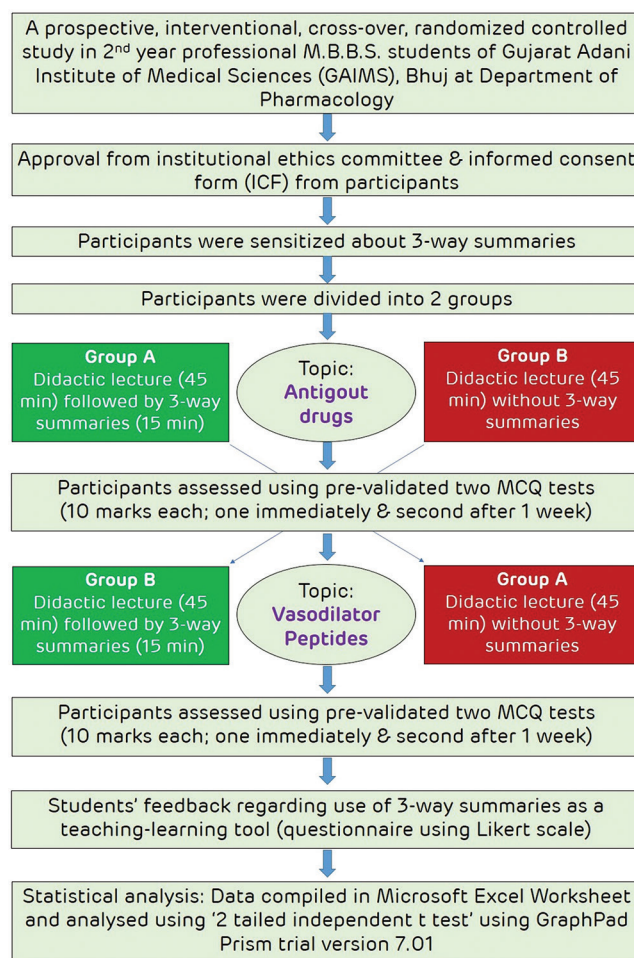


Figure 1: Brief methodology of the study

Second phase of the study was conducted next week after crossing over the groups. At the end of the lecture on vasodilator peptides, Group A was requested to proceed to another hall to accomplish the ten-mark MCQ test. Meanwhile, Group B was solicited for TWS for 15 min followed by same ten-mark MCQ test. After 1 week, all the participants were asked to attend ten-mark MCQ test.

The participants were asked to respond to the prevalidated structured questionnaire regarding their perception on TWS as a teaching–learning tool. Feedback by the participants was evaluated on a five-point Likert scale (i.e., strongly agree, agree, neutral, disagree, and strongly disagree).

We collected data of MCQ tests and feedback were recorded in Microsoft Excel worksheet. Statistical analysis was done by two-tailed independent *t*-test using GraphPad Prism trial version 7.01 (GraphPad Software, 2365 Northside Dr. Suite 560, San Diego, CA 92108).

Results

Phase I

Mean score of participants deteriorated in both groups 1 week after the lecture on antigout drugs in comparison to immediate result. Group A, who wrote TWS after lecture, score reduced from 4.85 ± 1.89 – 4.70 ± 2.05 with $P = 0.69$ which was not significant. While in Group B without TWS, score reduced more significantly ($P = 0.051$) as compared to Group A. It was reduced from 5.31 ± 1.81 to 4.63 ± 1.90 as shown in Figure 2 and Table 1.

Phase II

After the lecture on vasodilator peptides, students score improved in both the groups after 1 week as compared to immediate performance. The score improved from 4.96 ± 1.89 to 5.67 ± 2.35 in Group A who did not write TWS after the lecture. However, it was not statistically significant ($P = 0.09$). While it improved significantly ($P = 0.04$) in Group B who wrote TWS after the crossover. The score increased from 5.92 ± 2.24 to 6.83 ± 2.21 as shown in Figure 3 and Table 1.

Students' perception for three-way summaries

Students were asked few questions related to perception toward TWS using questionnaire containing Likert scale. It was done utilizing Google Forms. It was found out that students feel that TWS is a useful tool and should be utilized in regular classes. Perception of students is depicted in Figure 4.

Discussion

This study suggests that TWS is an innovative teaching-learning tool that affects retention of learning. It was found during the first phase of the study that deterioration in the score was less significant in Group A, who wrote TWS immediately after lecture on antigout

drugs. It was substantiated during second phase of the study after crossover. The performance improved more significantly in Group B who wrote TWS after lecture on vasodilator peptide. Students also liked the idea of TWS after the lecture as suggested by the response to the questionnaire.

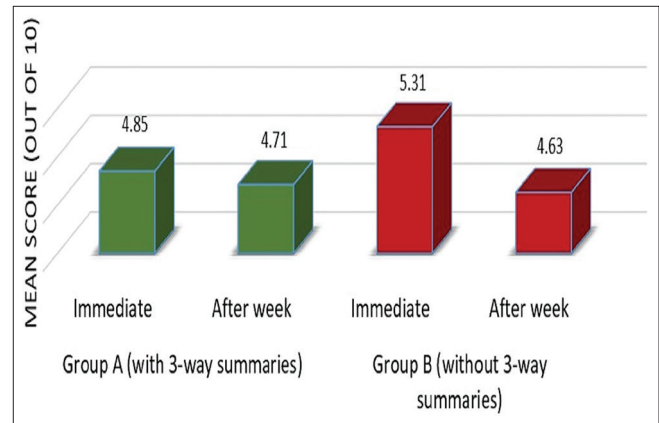


Figure 2: Students' performance immediately and after 1 week in both groups after lecture on antigout drugs

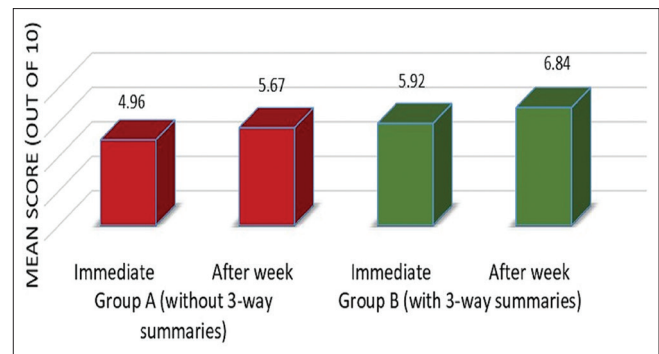


Figure 3: Students' performance immediately and after 1 week in both groups after lecture on vasodilator peptides

Table 1: Students' performance immediately and after 1 week in both groups

Topic (group)	Test	Count (n)	Score (mean±SD)	P
Antigout drugs (with TWS)	Immediate	60	4.85±1.89	0.69>0.05
	After 1 week	55	4.70±2.05	
Antigout drugs (without TWS)	Immediate	62	5.31±1.81	0.051>0.05
	After 1 week	57	4.63±1.90	
Vasodilator peptides (with TWS)	Immediate	51	5.92±2.24	0.04*<0.05
	After 1 week	49	6.83±2.21	
Vasodilator peptides (without TWS)	Immediate	54	4.96±1.89	0.09>0.05
	After 1 week	51	5.67±2.35	

SD=Standard deviation, TWS=Three-way summaries

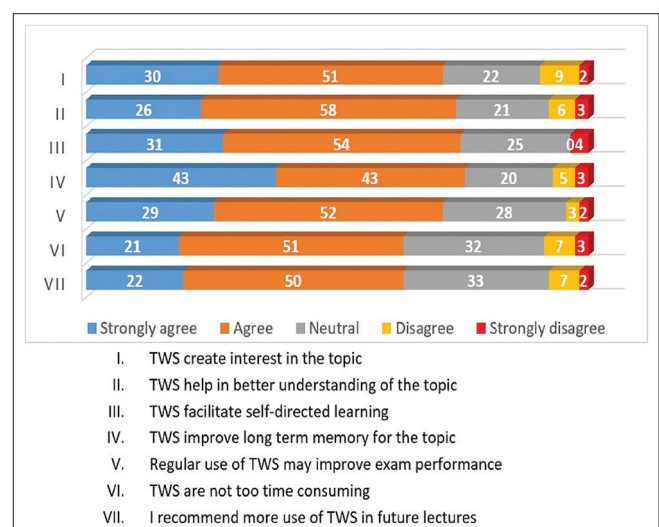


Figure 4: Students' perception for three-way summaries

There are no studies available which suggest usefulness and acceptance of TWS as a teaching–learning tool. However, there are many studies which implied usefulness of summary writing after the lecture. Summary writing has been considered a very important and essential skill in most areas of a student’s academic career. It is a highly useful and sophisticated skill which contributes to academic improvement, and encourages logical thinking by compelling students to articulate ideas which are not their own ideas.^[6-8]

When learners use their own words to summarize, connections between the learning material and learner’s previous knowledge are automatically established due to storage of associated information in the learner’s memory.^[9] King A suggest that summarizing at the end of lecture improves retention of memory by improving encoding both during the lecture and following the lecture.^[10]

Radmacher and Latosi-Sawin studied the impact of summarizing on the learning. Students found summarizing an effective tool to (1) learn the content of the lecture, (2) develop more effective methods for reading material, and (3) make their own writing more concise, more accurate, and clearer.^[11]

Summary writing is an effective teaching–learning tool because students have to make decisions about the relative importance of facts in a text for summarizing it. Thus, they comprehend the lecture content at a higher level than they would from simply listening.^[12]

Writing TWS is an advance type of summary writing. It might involve different depth of learning while student actually writes them. It might be more advantageous than authentic way of summary writing. Our study proves that it improves retention of memory. This method was also liked by the students.

This study concludes that “three-way summaries” are an effective teaching–learning tool and it potentiates retention of memory and long-term learning.

Students also like the idea of TWS and have the belief that it affects memory retention and it may impact on examination performance. They believe that it

encourages self-directed learning and create interest in the topic. They recommend use of the technique in the future lectures.

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Conflicts of interest

There are no conflicts of interest.

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