

HANDS-ON TRAINING VERSUS VIDEO PRESENTATION FOR INTERNS IN USING INSULIN PEN – A COMPARATIVE STUDY

Arunraj C N¹, Anjali Sadanandan²¹Professor, Department of General Medicine, Travancore Medical College, Kollam, Kerala, India.²Associate Professor, Department of Pathology, Travancore Medical College, Kollam, India.

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Corresponding Author:

Dr. Arunraj C N,
 Email: drarunrajcn@gmail.com

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**Abstract**

Background: There are various teaching-learning (T-L) methods regarding the technique of using insulin pens – pamphlets, videos, hands-on training. Video presentation and hands-on training are considered two effective ways of learning the technique. Video presentation has the advantage of having less teacher involvement. The objectives of the present study were to compare hands-on training with video presentation for interns regarding the use of insulin pen device and to compare the perception of students to hands-on training and video presentation. **Materials and Methods:** 60 interns were divided into 6 batches of 10 each. Each batch was randomly divided into two groups of 5 each - A and B. Group A was given hands-on training and group B was shown a video regarding the proper technique of usage of insulin pen. Two Post-tests were conducted after the teaching session for each group (OSCE-simulated patient). Post-test -1 was conducted soon after the teaching session and Post-test – 2 was conducted 15 days after post-test-1. OSCE marks were entered in the excel sheet and analyzed. The perception was assessed by a feedback questionnaire using a Likert scale. **Result:** Interns who had hands-on training as the T-L method scored higher than those who had video presentation in both post-test 1 and post-test 2 and was statistically significant. In the video presentation group, the total score for post-test 2 was significantly higher than post-test 1. In the hands-on demonstration group, the total score for post-test 2 was more than post-test 1 but not statistically significant. Regarding perception, interns favored hands-on training in all aspects. **Conclusion:** Hands-on training is a better T-L method over video presentation for teaching interns in using insulin pen but this needs more real-time teacher involvement which may be a concern in busy clinical departments. Even though scores after video presentation is low, it significantly improves once interns have a hand-on experience with the device after seeing the video even without direct demonstration by a teacher as seen by significantly augmented scores in post-test 2. Hence video presentation can still be used to train in using medical devices and has the advantage of seeing at their convenience.

INTRODUCTION

Insulin delivery devices are being used by a large number of patients because of ease of administration and convenience. The commonest among the devices are insulin pens. Self-use of insulin pens by patients needs some training to familiarize them with the device. Interns, in general, are ignorant regarding the technique of using insulin pens. Since interns are the first contact persons for patients and insulin pen devices are increasingly being used by patients, interns must know the usage of insulin pens. There are various teaching-learning (T-L) methods regarding the technique of using insulin pens – pamphlets, videos, hands-on training. Video

presentation and hands-on training are considered two effective ways of learning the technique.

T-L methods in the form of video presentation may greatly facilitate learning among medical students.^[1,2] Studies have shown that video-based education helps students to learn and reproduce clinical skills better because video promotes the simultaneous processing of both auditory and visual information.^[3,4] Sequential motion given by video would also motivate them to pay more attention to the information presented and learn the skill effectively.^[5] Video presentation can be used as a large group T-L method.^[6] It may be especially helpful in the context of limited faculty availability and time constraints. Hands-on training gives the

subjects a real hand experience of using the device which might facilitate learning to a greater extent than video presentation even-though hands-on training requires more effort and time from the teacher.^[7,8] OSCE can be used as a tool for assessment of the subjects after intervention.^[9] A study on the assessment of perception by Bhoumick shows that students prefer individualized teaching.^[10] The objectives of the present study were to compare hands-on training with video presentation for interns regarding the use of insulin pen device and to compare the perception of students to hands-on training and video presentation.

MATERIALS AND METHODS

Study setting: Travancore Medical College, Kollam.

Study design: Interventional study.

Study population: Interns.

Study period: 3 months.

Sample size: 6 batches of 10 each making a total of 60 interns (six exposures).

Sampling method: Random sampling.

Intervention: Hands-on training and video presentation.

Inclusion criteria

Interns willing to participate after getting informed consent.

Exclusion criteria

Interns who are unwilling for the study.

Study tool: OSCE Checklist (Table 1) was used for assessment. The perception was compared using a Likert scale based feedback questionnaire (Table 2). OSCE checklist and feedback questionnaire were validated by the institutional expert committee.

Data collection: 60 interns were divided into 6 batches of 10 each. Each batch was randomly divided into two groups of 5 each - A and B. Group A was given hands-on training and group B was shown a video regarding the proper technique of usage of insulin pen (Novopen 4). Hands-on training was given to interns by the investigator where the technique of using Novopen 4 was demonstrated step by step starting with explaining the parts of pen followed by loading the cartridge, resuspending insulin, attaching the needle, testing insulin flow, selecting dose, correct injection technique and needle removal. Video presentation also explained the correct technique of using Novopen 4 in a step by step way. Two Post-tests were conducted after the teaching session for each group (OSCE-

simulated patient). Post-test 1 was conducted soon after the teaching session and Post-test 2 was conducted 15 days after post-test-1. OSCE marks were entered in the excel sheet. The perception was assessed by a feedback questionnaire using a Likert scale. There was a crossover of groups after data collection for ethical reasons where those with hand-on training got the video presentation and vice versa.

Statistical analysis: Data collected was entered in the Microsoft excel sheet and analyzed using descriptive statistics like frequency, percentage, mean, standard deviation and inferential statistics like independent sample 't' test or Mann Whitney U test. SPSS software was used for analysis.

Ethical consideration: Institutional Ethics Committee clearance was taken before commencing the study. There was a crossover of study groups after data collection for ethical reasons where those with hand-on training got the video presentation and vice versa.

Informed consent: Informed written consent was taken from all interns before conducting the study.

RESULTS

Interns who had hands-on training as the T-L method scored higher than those who had video presentation in both post-test 1 (14.11 versus 12.01) and post-test 2 (14.15 versus 13.27) and was statistically significant (Table 3, Figure 1). In the video presentation group, the total score for post-test 2 was significantly higher than post-test 1. In the hand-on demonstration group, the total score for post-test 2 was more than post-test 1 but not statistically significant. For steps involving explaining parts of the pen, complicated steps like loading the pen with cartridge, correct injection technique, clearing doubts of the patient, the score was significantly higher for hands-on demonstration group compared to video presentation in post-test 1 but the difference became less significant in post-test 2. Among interns who had video presentation, score improved significantly in post-test 2 compared to post-test 1 in steps involving explaining parts of the pen, complicated steps like loading the pen with the cartridge, and clearing doubts of the patient but no significant change was observed in hands-on demonstration group. Regarding perception, interns favored hand-on training in all aspects. Both groups did not find the T-L method time-consuming.

Table 1: OSCE – Demonstrating technique of using insulin pen (Novopen 4).

Steps to be performed	Score	Subject score
Introduces self to patient	1	
Explains parts of insulin pen	2	
Twist pen apart, insert the cartridge with the threaded end first and twist back.	2	
Re-suspend insulin by correct technique	1	
Attach needle	1	
Test insulin flow	1	
Select correct dose	1	
Lift skin fold	1	

Inject perpendicular	1	
Keep needle for 6 more seconds after dose counter has returned to zero	1	
Remove needle	1	
Clear doubts of the patient	2	
Total	15	
Total (%)	100	

Table 2: Likert feedback form

Parameters	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
The session was interesting.					
I was able to follow and understand the topic.					
My doubts were clarified.					
Helps to retain the memory.					
Helps to boost the performance.					
Can be adapted for teaching other topics.					
This method of teaching is time-consuming.					
Overall this method was effective and beneficial to me.					

Table 3: Table showing the association between scores of different T-L methods in Post-test 1 and Post-test 2.

	Group	N	Mean	SD	t value	p value
Post-test 1	Hands-on training	30	14.11	0.86785	4.875	0.001
	Video presentation	30	12.01	2.19417		
Post-test 2	Hands-on training	30	14.15	1.05781	2.791	0.007
	Video presentation	30	13.27	1.35244		

*p value was calculated by independent sample t-test, $p < 0.05$ considered as statistically significant.

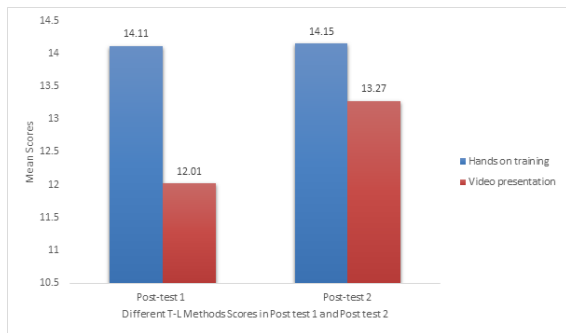


Figure 1: Scores of different T-L methods in post test 1 and post test 2

DISCUSSION

Interns who had hands-on training as the T-L method scored higher than those who had video presentation in both post-test 1 and post-test 2 and was statistically significant. This shows the advantage of hands-on training over video presentation in training interns in the use of medical devices like insulin pens. This finding is in tally with previous studies by Hilal Z et al,^[7] and Kapoor P et al,^[8] which shows better effectiveness of hands-on demonstration over video presentation. In the video presentation group, the total score for post-test 2 was significantly higher than post-test 1. This could be because the first post-test gave them hands-on experience in using the pen which could have boosted their performance in the second post-test. In the hand-on demonstration group, the total score for post-test 2 was more than post-test 1 but not statistically significant. Already this group had a very high score in post-test 1 with less room for improvement in post-test 2 which could account for this finding. Post-test 2 was performed to assess memory retention, but in both groups total score was

more for post-test 2 probably because post-test 1 itself helped to augment learning.

For steps involving explaining parts of the pen, complicated steps like loading the pen with the cartridge, correct injection technique, clearing doubts of the patient, the score was significantly higher for hands-on demonstration group compared to video presentation in post-test 1 clearly showing the advantage of hands-on training as a T-L method for practical training, but the difference became less significant in post-test 2. Among interns who had video presentation, score improved significantly in post-test 2 compared to post-test 1 in steps involving explaining parts of the pen, complicated steps like loading the pen with the cartridge, and clearing doubts of the patient probably helped by the hands-on experience during post-test 1 but no such significant change was observed in hands-on demonstration group. Regarding perception, interns favored hand-on training in all aspects. Both groups did not find the T-L method time-consuming. A limitation of the study is that only insulin pen was the device selected for this comparative study and cannot be generalized for all medical devices.

CONCLUSION

Hands-on training is a better T-L method over video presentation for teaching interns in using insulin pen but this needs more real-time teacher involvement which may be a concern in busy clinical departments. Even though scores after video presentation is low, it significantly improves once interns have a hand-on experience with the device after seeing the video even without direct demonstration by a teacher as seen by significantly augmented scores in post-test 2. Hence video

presentation can still be used to train in using medical devices and has the advantage of seeing at their convenience.

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