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Original Research Article

Comparison of "Peyton's 4 Step Approach" Vs "See One Doone Approach" for Learning External Chest Compression in Interns: The Randomised Control Trial

Kanvee Vania[1], Mayur Vania[2], Dinesh Babariya[3]

[1]Professor and Head, Department of Anaesthesia, GMERS Medical Collage, Junagadh, Gujarat, India
[2]Associate Professor, Department of Orthopaedics, GMERS Medical Collage, Junagadh, Gujarat, India
[3]Assistant Professor, Department of Anaesthesia, GMERS Medical Collage, Junagadh, Gujarat, India

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Corresponding author: Dr. Mayur Vania
Conflict of interest: Nil

Abstract

Background: Teaching psychomotor skills like external chest compression, which are highly relevant and critical but very low feasibility is often challenging in medical education. Peyton's four step approach is structured, methodical and instructional method, very effective method foracquisition of complex psychomotor skills.

Aim: The aim of this study is to determine the effects of application of Peyton's 4 step approach in teaching psychomotor skills.

Materials and Methods: This prospective randomised control trial was conducted among 50 interns posted in Anaesthesiology and Surgery department from February to May 2025. Interns enrolled for the study were divided in two i.e. group I and group II. . Group I participants were taught external chest compression by see one do one approach and Group II participants by Peyton's 4 step approach. Pre-test and post-test scores were recorded by direct observation (DO) with checklist using common scoring checklist in both groups. Satisfaction level of interns and faculties was recorded using five point Likert's scale.

Results: The present study revealed that 84% students performed average and 16% good in group I, while 44% performed average and 56% good in group II. There was significantly higher post-test score (7.52) in group II as compared to group I (6.52). It was also found that 72% were highly satisfied with Peyton's four step approaches, while 8% were highly satisfied with conventional method.

Conclusion: It is concluded that Peyton's four step approaches is more effective method in teaching external chest compressions than traditional see one do one method to interns. Additionally, student's as well as faculties satisfaction level is high with this method.

Keywords: Peyton's Four Step Approach, See One Do One Approach, External Chest Compressions, Psychomotor Skills.

Introduction

Effective clinical skill acquisition of complex psychomotor skills is very important and challenging in medical education.

The effective external chest compression is very important psychomotor skill to maintain circulation to provide oxygen to vital organs during sudden cardiac arrest [1].

William Halsted's "see one do one" is commonly used conventional method to teach psychomotor skills. This technique consists of demonstration of procedure by trainer and then trainee performs the procedure [2, 3]. Patient safety is main concern in this technique due to inadequate knowledge, less experience and lack of supervision [4]. Rodney Peyton's four step approach is very effective method for clinical skill learning especially for complex procedural skills [5, 6].

Peyton's 4 step approach is structured, methodical and instructional method consisting of 4 steps [1, 5]: -

1. Demonstration: Trainer demonstrates the skill without any additional comments.
2. Deconstruction: Talk the trainee through. The trainer demonstrates the skill slowly with explanation of sub steps of procedure.
3. Comprehension: Trainee talks trainer through. The trainee describes sub steps and trainer performs skill.

4. Performance: Trainee does. The trainee performs skill and narrates sub steps.

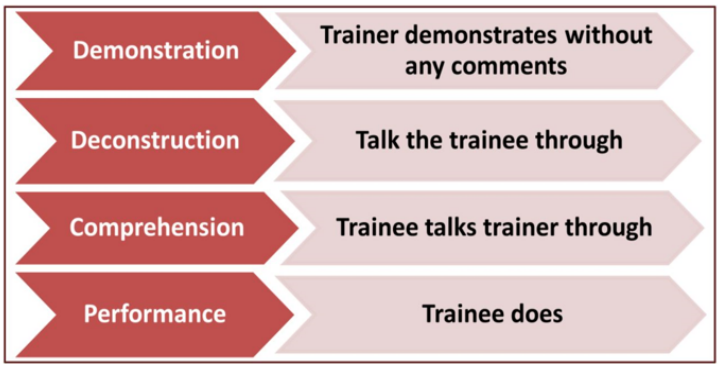

Chart 1:

Peyton's 4 step approach incorporates various aspects of learning theories [1, 5]. Steps 1 and 2 reflects thinking which involved cognitive domain while step 3 is crucial [7], it reflects sharing which requires processing of knowledge and organization of information before describing sub steps.

Aim

The aim of this study is to determine the effects of application of Peyton's 4 step approach in teaching psychomotor skills.

Objectives

- To compare the effectiveness of Peyton's four step approach with see one do one method on intern's performance for learning external chest compression.
- To compare student satisfaction level and confidence level in both methods.
- To compare satisfaction level among faculties in both methods.

Materials and Methods

a. Study Design: This is prospective randomized controlled trial with two study groups to compare effectiveness of Peyton's 4 step approach with conventional see one do one approach in interns.

b. Study population and place of study: Interns posted in Anaesthesiology and Surgery department from February to May 2025 and 4 faculties willing to participate voluntarily. This study was conducted at Anaesthesiology department, GMERS medical college, Junagadh.

c. Duration of study: 4 months (February to May 2025)

d. Ethical permission from the institute: IEC/04/2025 dated 04/03/2025

e. Sample size: Convenient sampling of total 50 interns done for the enrolment in the study.

f. Selection criteria: Inclusion & Exclusion criteria:

Inclusion Criteria: Interns posted in Anaesthesiology and Surgery department from February to May 2025 and 4 faculties willing to participate voluntarily after sensitisation.

Exclusion Criteria: Interns having prior training or any experience of CPR training excluded from the study.

g. Data collection method: Various tools were prepared by investigators for data collection after thorough review of literature [8, 9, and 10].

The common scoring checklist was prepared by investigators, which included each steps of external chest compressions; used to assess intern's skill in performing external chest compression and to minimize subjective biases. The total score was out of 10 marks, 1 mark for each step. Pre-test and post-test scores were recorded out of 10 marks. Performance graded as poor (<3), average (3-7) and good (>7) on the basis of scores achieved.

The self-confidence and satisfaction level of intern's in performing skill was measured using five point Likert scale [8, 9, 10] after teaching skill of external chest compression. It consisted of 18 statements; each statement had 5 points ranging from 1 (totally disagree) to 5 (strongly agree) and total score was 18-90. The self –confidence and satisfaction level graded high if score is >75%, moderate for 50-75% and low for < 50%.

At the end of questionnaire, there were open ended questions to give feedback regarding learning experience.

This study analysed faculty satisfaction level with Peyton's 4 step approach using five point Likert's scale. The questionnaire included 10 statements with 5 points for each statement.

The total score was 10-50. The higher score represented better satisfaction level as follows; > 75% score represented high satisfaction level, 50-75% moderate satisfaction and < 50 % low satisfaction level. At the end of questionnaire, there

were open ended questions to give feedback of their experience and justify their score.

h. validation: The validity of study tools was determined by committee of experts from Anaesthesiology and Medicine departments and MEU. Each expert individually reviewed and provided feedback on clarity, relevance, completeness, language and formatting. They ensure whether checklist covers all relevant aspects of construct being measured, like skills, knowledge, attitude etc. For questionnaires, they checked if it aims to measure perceived effectiveness of teaching learning methods, student's confidence and attitude towards learning.

i. Intervention done: Interns enrolled for the study were divided in two groups i.e. group I and group II randomly by lottery method. Group I participants were taught external chest compression by see one do one approach and Group II participants by Peyton's 4 step approach. Pre-test and post-test scores were recorded by (DO) Direct observation with checklist using common scoring checklist i.e. tool 1 in both groups. Intern's confidence and satisfaction level measured using tool 2[8, 9, and 10]. Satisfaction level of faculties was recorded using tool 3[8, 9, and 10]. Interns were taught by better method after completion of data collection.

j. Statistical analysis: Statistical analysis was done using MS excel and SPSS software. Categorical data expressed as frequency and percentage. The numerical data expressed as mean and standard deviation. Pre-test and post-test scores analysed using Student's paired t-test. The self-confidence level and satisfaction level analysed using Mann-Whitney test. Chi Square and Fisher's test used to test the significant differences in the categorical data. The p- value less than equal to 0.05 considered significant.

Results

Table 1: Comparison of Pre-test and Post-test scores

	Group I		Group II			
	Mean	**SD**	**Mean**	**SD**	**Paired t-test**	**p- value**
Pre-test score	3.04	1.17	3.08	1.11	t=0.124	0.9018
Post- test score	6.52	1.04	7.52	1.04	t=3.3833	0.0014

Table 2: Comparison of performance of students

Score	**Group I**		**Group II**		
	Frequency (n=25)	**Percentage**	**Frequency(n=25)**	**Percentage**	**p-value**
Average (4-7)	21	84 %	11	44 %	0.008
Good (8-10)	4	16 %	14	56 %	

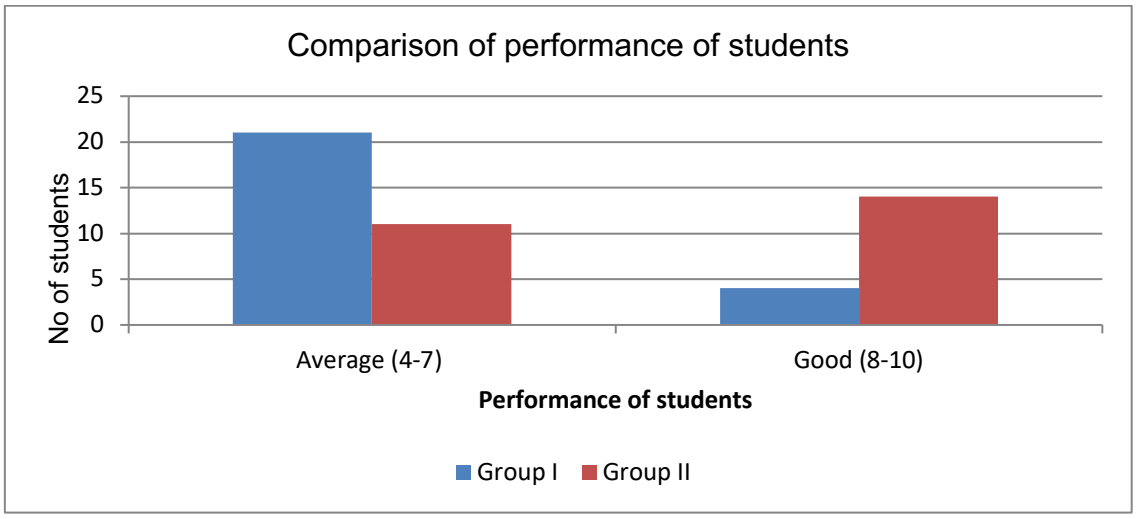

Figure 1: Comparison of performance of students

Table 3: Satisfaction level of students

Level of satisfaction	**Group I**		**Group II**	
	No. (25)	**Percentage (%)**	**No. (25)**	**Percentage (%)**
Moderate	23	92 %	7	28 %
High	2	8 %	18	72 %

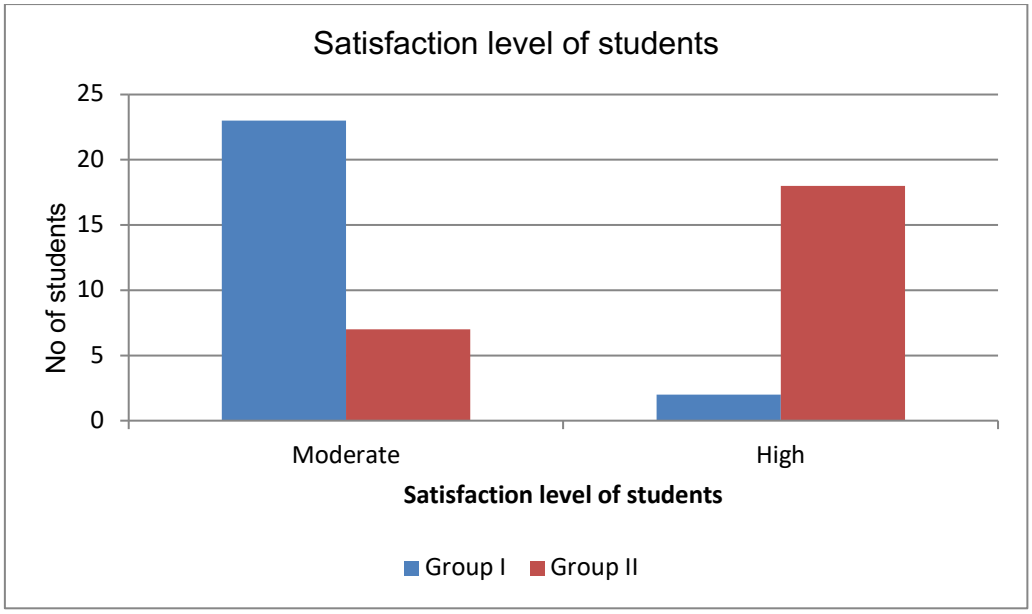

Figure 2: Satisfaction level of students

Table 4: Satisfaction level of faculties

Level of satisfaction	Group I		Group II	
	No. (4)	Percentage (%)	No. (4)	Percentage (%)
Moderate	4	100 %	1	25 %
High	0	0 %	3	75 %

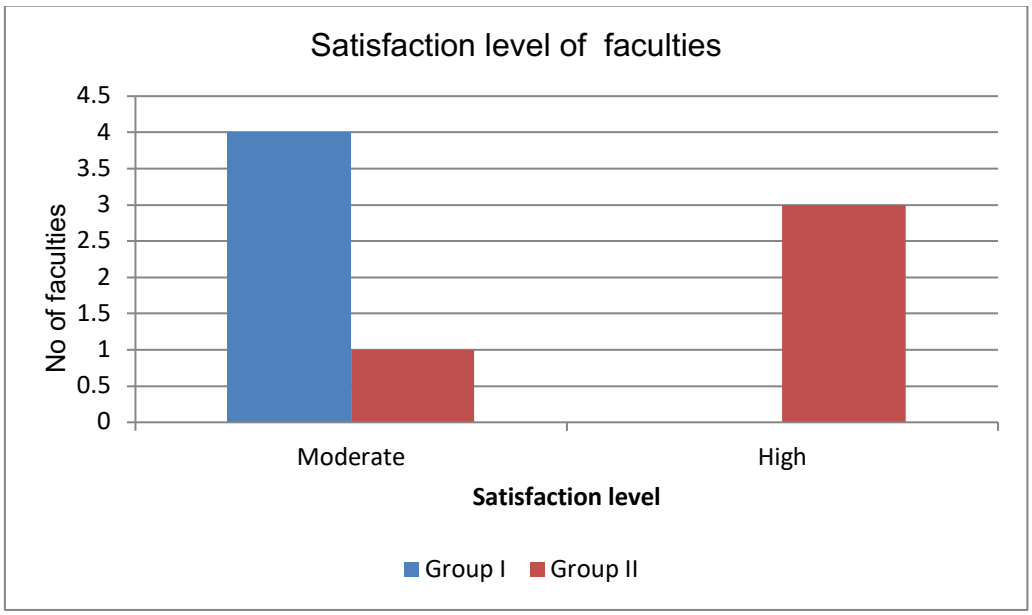

Figure 3: Satisfaction level of faculties

In open ended questions, students found Peyton's approach interesting and engaging method, understand each part clearly, hands-on part made them felt confident and satisfied. Challenges faced by them are limited time for hands-on practice, few students felt nervous in demonstrating steps. They suggested giving more time for practice, inclusion of handouts and adding video based recaps. Faculties found that Peyton's four step approach provided clear structure and minimized confusion for learners. Students appeared engaged and confident by final step, allow active participation and observed progressive improvement in performance at each stage. They found time management challenging, some students required more repetitions while repetition became monotonous for fast learners and initial demonstration didn't capture attention of all students. They suggested using audio-visual aids, increasing time and number of mannequins.

Discussion

It is often challenging to teach psychomotor skills like external chest compression, which are highly relevant and critical but very low feasibility in medical education. Such lifesaving skills should be performed properly and competently. It is necessary to teach such skills in skill lab appropriately, so that students can perform properly in real life situations. Peyton's four step approach has been successfully applied to teach a variety of complex psychomotor skills in medical education. It improves skill acquisition, enhances memorization [8], higher self-confidence and satisfaction levels.

This study compared the effectiveness of Peyton's four step approach with conventional 'see one do one' approach. The findings of the present study revealed that 84% students performed average and 16% good in group I, while44% performed average and 56% good in group II (Table 2 and Fig 1). There was significantly higher post-test score (7.52) in group II as compared to group I (6.52) (Table 1). It was also found that 72% were highly satisfied with Peyton's four step approaches, while 8% were highly satisfied with conventional method (Table 3 and fig 2).

We have also studied satisfaction level of faculties and observed that 75% faculties were highly satisfied with newer method while all faculties were moderately satisfied with traditional method (Table 4 and Fig 3). Peyton's 4 step approach consists of four steps i.e. demonstration, deconstruction, comprehension and performance. Step 1 is based on social learning theory, it produces cognitive blueprint of procedure by observation. Step 2 utilizes cognitive load reduction theory.

A complex skill is broken down in to smaller and simple sub-steps, reduces load on trainee's memory. The core theory behind the most important and crucial step for skill acquisition, which is step 3, is constructivism. During this step trainee actively processes information, recall and organize thoughts. The learning theory of step 4 is based on experiential learning, the trainee engagges on successful performance of skill.

Kautter et al conducted similar study to observe effects of Peyton's four-step approach on objective performance measures for gastric tube insertion on mannequins. They concluded Peyton's Four-Step Approach is superior to standard instruction with better professionalism, communication skills and faster learning [6]. Kautter et al identified in another study, Peyton's Step 3 as being the most crucial step for learning success, beyond the benefit of a mere repetition of skills demonstration [7]. Our findings are in line with Mohammad et al, who compared peer's application of modified Peyton's four step approach with traditional method among pediatric nursing students in performing neonatal CPR and reported that it has a positive effect on clinical skill performance among pediatric nursing students [8]. They also found improved satisfaction level and higher competency.

Gradl-Dietschet al conducted prospective randomized trial to assess effectiveness of Peyton's four step approach on teaching complex spinal manipulation techniques and also to study gender influence on learning outcomes [5]. They observed no differences in theoretical knowledge but higher OSPE scores in Peyton's group as compared to Control group. OSPE scores after 6 months were equally low in both groups. They observed no gender influence on competency or skill retention.

On the contrary, Munster et al showed no essential differences in medical student's performance dependent on teaching method implemented. They conducted study to compare medium term effects on learning external chest compression on medical students of 2nd and 3rd trimester in three groups: PEY (Peyton's 4 step approach), PMOD (Peyton's 4 step approach without step 3) and STDM (standard see one do one model) [1].

The limitations of the study are that only one psychomotor skill was used for teaching, more studies for different types of skills are required to gather more evidence. Repeat assessment is required after few months to test the retention of acquired skill. It is recommended to conduct more studies using different types of skills, including multiple assessments.

Conclusions

It is concluded that Peyton's four step approach is more effective method in teaching external chest compressions than traditional see one do one method to interns. Additionally, student's as well as faculties satisfaction level is high with this method. By breaking down the learning process in to structured interactive steps, the Peyton's method enhances understanding, skill acquisition and satisfaction level. Incorporating this method in teaching skills in medical education can lead to better performance and greater long term competency among learners.

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