



EFFECTIVENESS OF ONE MINUTE PRECEPTOR MODEL AND SNAPPS MODEL AS CLINICAL TOOLS FOR POSTGRADUATE TEACHING - A COMPARATIVE STUDY

Medical Education

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ABSTRACT

Introduction: One minute preceptor (OMP) and SNAPPS are two newer assessment methods that also can be used as teaching learning methods to impart better clinical reasoning and critical thinking among residents. Here in this study an attempt was made to compare them with one another and collect the student's perception towards these two methods. **Methods:** The study was conducted in thirty eight postgraduate students. After the introduction class each student was made to discuss eight simulated cases each in OMP and SNAPPS formats from different areas of clinical medicine over the period of seven months. These encounters were assessed with various predetermined parameters to compare performance of students in OMP and SNAPPS formats. Following the last encounter feedbacks were collected from all students in a Likert's scale format regarding their perception towards both the methods and that was also analyzed in detail. **Results:** Students could present cases more easily and could bring up uncertainties and learning points about the cases. Students could come up with significantly more differential diagnoses with justifications, narrate more realistic and appropriate management plans with the SNAPPS method compared to OMP. The participating students rated both OMP and SNAPPS as very helpful methods for teaching and learning with the latter method considered better of two. **Conclusion:** Both OMP and SNAPPS methods had shown to improve critical thinking and clinical reasoning of a postgraduate along with boosting their confidence levels and making case presentations easier. SNAPPS was found to be a better clinical tool than OMP.

KEYWORDS

One minute preceptor, SNAPPS, clinical reasoning, critical thinking, student perception

INTRODUCTION

Medical education is presently looking at a paradigm shift in the way of learning with newer methods of teaching and assessment. The main constraints in providing quality education for our students are less time, inadequate institutional financial support, lack of proper resources and lack of interest from students.¹ Traditional oral case presentations focus mainly on recall of learned matters and seldom utilize reasoning capacities and applied knowledge of a student. Less time and effort put forth by teaching faculty act as a demotivating factor for students. The concepts of One Minute Preceptor (OMP) and SNAPPS came up while researching for newer teaching methods that can also be used as assessment methods which require very less time, resources and financial investments to execute. The OMP teaching method is a teacher centered one featuring five microskills which are get a commitment, probe for supporting evidence, teach a general principle, reinforce what was done well and correct mistakes. SNAPPS on the other hand is a learner centered method where its name is a mnemonic of its six steps which are summarizing, narrowing down differentials, analyzing differentials, probing the preceptor, planning the management and selecting a case related issue for self directed learning. Both these methods encourage clinical reasoning and increase student involvement in patient care by identifying key issues. They are active learning strategies which support student autonomy, foster motivation and create a positive impact on learning outcomes.²

RESEARCH OBJECTIVES

1. Primary objective is to compare between OMP and SNAPPS regarding their effectiveness as teaching and assessment methods
2. Secondary objective is to assess a postgraduate student's perception towards OMP and SNAPPS models of teaching and assessments

METHODOLOGY

Study Design: This is a hospital based comparative study between OMP and SNAPPS with simulated case scenarios conducted in Respiratory medicine department and General Medicine department in MES Medical College, Perinthalmanna from February 2022 to September 2022.

Study Population And Sampling Method: Thirty eight postgraduate students in the departments of General Medicine, Respiratory Medicine, Anesthesiology and Pediatrics were included in the study of which sixteen were first year students, fourteen were second years and eight were in their final year of post graduation. Convenience sampling method was adopted. Each student was given 8 OMP and 8 SNAPPS exposures each. That accounted to 128 exposures each from first years,

112 exposures from second years and 64 exposures each from third years accounting to 304 exposures each of OMP and SNAPPS in the study.

Method Of Study: The post graduate students were divided to two groups containing equal number of first years, second years and final years. Sixteen topics of common interest were identified from eight different areas of General Medicine that were common and needed for all four specialties. For example topics selected from cardiology were ECG of atrial fibrillation and a simulated case scenario of infective endocarditis. When Group A presented topic one of one area in OMP method, group B presented the same topic in same area in SNAPPS method. One week later the second topic in that area will be presented in OMP method by group B and SNAPPS method by group A students. Likewise each student had 8 OMP and 8 SNAPPS presentations. Students were not compared among themselves as they were from different specialties. How one particular student performed with OMP and the same did with SNAPPS were only compared. Each encounter lasted approximately five to six minutes and the entire sixteen case discussions were completed in approximately three hours on every day of data collection. During case presentations number of diagnosis with numbers of justification for the same, number of differential diagnosis with number of justifications for each of them, number of uncertainties and learning points identified in that case and number of management plans furnished were recorded. The initiatives shown by the student in various aspects were recorded. At the end of study perception of students was collected towards both OMP and SNAPPS methods.

Analysis: Databases were created year-wise and for all encounters mean, standard deviation, standard error and 95% confidence interval were calculated. Parametric tests were used though the distribution was non-normal due to relatively large sample size and lack of outliers as proven by the Shapiro-Wilk test. The means were compared with student's t test and the perception was analyzed calculating median with IQR.

RESULTS

Both OMP and SNAPPS were found to be very effective tools for clinical teaching. As expected there was a progressive improvement in performance of students as the seniority increased. Mean value of all assessed parameters of final year postgraduates were better than second years which was in turn better than the first year postgraduate students for both OMP and SNAPPS models of case presentations. Statistically significant difference was obtained proving SNAPPS as a more effective tool in teaching and assessing. The same students were able to bring out significantly more justifications for diagnosis, number of differential diagnosis, justifications for differential diagnosis,

questions and uncertainties about the case discussed and thereby more learning points for self study and more management plans with

SNAPPS method than OMP method. The entire results are consolidated in table 1 below.

Table 1: Year-wise And Overall Comparison Between OMP and SNAPPS Methods

Parameter Assessed		First Year (n=128)		Second Year (n=112)		Third Year (n=64)		Overall (n=304)	
		OMP	SNAPPS	OMP	SNAPPS	OMP	SNAPPS	OMP	SNAPPS
Number of justifications for the most likely diagnosis	Mean (SD)	3.49 (0.81)	3.89 (0.95)	3.67 (0.76)	4.29 (0.80)	4.06 (0.81)	4.64 (0.87)	3.68 (0.82)	4.19 (0.93)
	T score (P value)	T = 3.625 (P = 0.003)		T = 5.946 (P < 0.001)		T = 3.903 (P = 0.002)		T = 7.172 (P < 0.001)	
Number of differential diagnosis presented	Mean (SD)	1.64 (0.97)	2.26 (1.26)	1.80 (0.91)	2.5 (1.14)	2.31 (0.1)	3.05 (1.12)	1.84 (0.99)	2.51 (1.23)
	T score (P value)	T = 4.411 (P < 0.001)		T = 5.079 (P < 0.001)		T = 5.265 (P < 0.001)		T = 7.399 (P < 0.001)	
Number of justifications for differential diagnosis	Mean (SD)	1.57 (0.96)	2.21 (1.23)	1.72 (0.93)	2.46 (1.11)	2.22 (1.01)	3.05 (1.12)	1.76 (0.99)	2.48 (1.21)
	T score (P value)	T = 4.641 (P < 0.001)		T = 5.408 (P < 0.001)		T = 4.403 (P < 0.001)		T = 8.030 (P < 0.001)	
Number of questions and uncertainties presented	Mean (SD)	1.56 (0.79)	2.38 (1.06)	1.73 (0.84)	2.51 (0.91)	2.11 (1.0)	3.0 (1.03)	1.74 (0.88)	2.56 (1.03)
	T score (P value)	T = 7.018 (P < 0.001)		T = 6.666 (P < 0.001)		T = 4.960 (P < 0.001)		T = 10.554 (P < 0.001)	
Number of management plans presented	Mean (SD)	1.31 (0.58)	1.93 (0.80)	1.41 (0.71)	1.92 (0.76)	1.77 (0.91)	2.55 (1.13)	1.44 (0.73)	2.06 (0.90)
	T score (P value)	T = 7.099 (P < 0.001)		T = 5.190 (P < 0.001)		T = 4.301 (P < 0.001)		T = 9.328 (P < 0.001)	

Similarly the initiative taken by a postgraduate student on various aspects at the time of case presentation were also found out with the help of some dichotomous questions in the second part of the data collection tool. As the case presentation progressed, if the student brought out the diagnosis after summary by himself without probing,

the response 'yes' would be ticked across the first question. Similarly if they justified their diagnosis without asking to do that, 'yes' across the second question would also be ticked. Then the number of students who did so was found out along with their percentage and the entire data regarding the same are consolidated in the table 2 below.

Table 2: Year-wise And Overall Comparison On The Student Initiative In OMP and SNAPPS Methods

Taking initiative to... [count (percentage)]	First Year (n=128)		Second Year (n=112)		Third Year (n=64)		Over all (n=304)	
	OMP	SNAPPS	OMP	SNAPPS	OMP	SNAPPS	OMP	SNAPPS
Present most likely diagnosis	128 (100%)	128 (100%)	112 (100%)	112 (100%)	64 (100%)	64 (100%)	304 (100%)	304 (100%)
Justify the most likely diagnosis	128 (100%)	128 (100%)	112 (100%)	112 (100%)	64 (100%)	64 (100%)	304 (100%)	304 (100%)
Present differential diagnosis	89 (70%)	106 (83%)	89 (79%)	100 (89%)	57 (89%)	61 (95%)	235 (77%)	267 (88%)
Justify the differential diagnosis	28 (22%)	83 (65%)	36 (32%)	83 (74%)	19 (30%)	50 (78%)	83 (27%)	216 (71%)
Initiate patient management plans	96 (75%)	114 (89%)	90 (80%)	104 (93%)	58 (91%)	63 (98%)	244 (80%)	281 (92%)

All thirty eight students in all their eight OMP and eight SNAPPS encounters took initiative to present the most likely diagnosis and justify that which indirectly revealed the interest students had shown to the new teaching learning methods. The number of students who took initiative to present differential diagnosis and initiate discussion on patient management was similar with both OMP and SNAPPS methods. However significant difference was noted in taking initiative to justify the differential diagnosis. While 71% of the participating students did that during the SNAPPS presentation, only 27% of the same were able to do so with the OMP format and the rest needed probing. And in this aspect also there was a progressive improvement as seniority increased with both models. A final year postgraduate took more initiative, showed more interest and presented cases more actively than a first year.

For analyzing the perception of students towards OMP and SNAPPS methods, a Likert's five point scale each was given for both OMP and SNAPPS models for all the students to fill and return which contained eleven questions. The responses are consolidated in table 3 below. The interquartile range (IQR) generally ranged between 0 and 1 which showed good consensus among the opinions. While assessing answers to the second question it was found that most respondents indicated agreement with the idea that case presentation was easier with both OMP and SNAPPS methods. Overall on a scale of 1 to 5 majority of students rated a 3 for OMP and 4 for SNAPPS highlighting two facts - both OMP and SNAPPS were found to be beneficial for learning by students and the latter was considered better than the former except in time management.

Table 3: Students Perception Towards OMP and SNAPPS

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Methods

Feedback Parameter	Median (Minimum, Maximum, IQR)	
	OMP	SNAPPS
I was able to give an in-depth case presentation	4 (3,4,0)	4 (4,5,0)
It was easy to present case in given format	4 (4,5,1)	4 (4,5,1)
I was able to speak out all the difficulties concerning patient while discussing the case	3 (2,4,1)	4 (3,5,1)
I could sequence and formulate differential diagnosis	4 (2,4,1)	4 (3,5,0)
I could hypothesize my differential diagnosis matching with case presentation	3 (2,4,0)	4 (3,5,1)
I could narrate realistic and appropriate patient management plan	4 (3,4,1)	4 (3,5,1)
I could identify sufficient case based learning issues for self study	3 (2,4,0)	4 (3,5,1)
It was easy to bring up uncertainties in case myself	3 (2,4,1)	4 (3,5,1)
Time management during case presentation was easy	5 (4,5,0)	4 (3,4,1)
I could lead the case presentation by taking active initiative	3 (3,5,0)	4 (3,5,0)
Overall rating of case presentation on a scale of 1-5	3 (3,4,1)	4 (4,5,0)

DISCUSSION

The results from this study suggested both OMP and SNAPPS improved the case presentation skills of students by improving their

critical thinking, clinical reasoning and ability to bring up key points to discuss and manage in each case themselves. SNAPPS was found to be a better method at postgraduate level for acquiring these complex microskills and delivering quality clinical experience in a short time. A teaching model proposed by Wolpaw et al, SNAPPS was found to promote learning concise case presentation with a presentation style that encouraged the student to raise questions themselves to accelerate problem solving and autonomous learning.³ SNAPPS being a learner centered method the students were more active in solving the issues dealt by the patient. The OMP model which was proposed by Neher et al in 1992 was more of a teacher centered method.⁴ Here the teacher acted as a facilitator or preceptor and took his student through a streamlined thought process to facilitate problem solving. In OMP one general rule was taught on every case discussion that would be a take home message from that case.

Both SNAPPS and OMP, the former more than the latter, seemed to address the key constraints of clinical teaching that were mentioned in the introduction part of this paper like the relatively passive role of learners, exchange of only factual information without reasoning and perceived lack of time and resources for teachers. SNAPPS and OMP both took hardly six minutes to teach a key concept and needed only one simulated case setting. Only two case studies came out so far comparing OMP with SNAPPS heads on, one using a single simulated case of musculoskeletal lower back pain and another utilizing a simple case and a complex case each presented in both formats and compared.^{5,6} Both studies had shown these two methods equally effective with students able to perform better with SNAPPS method.

Students could initiate discussion about diagnosis and management plans more often with the SNAPPS method than with OMP method. OMP students always waited for the teacher to take an active role and guide the discussion. SNAPPS suited more to the principles of andragogy by encouraging learner autonomy.⁷ SNAPPS allowed a student to lead the discussion thereby providing an active role in clinical practice which was crucial to enhance their competence and bolstered their feeling of relatedness and feeling as part of a team.⁸ In SNAPPS methods students were encouraged to express their uncertainties which resulted in identifying more learning objectives. This was proven in this study as the students came up with more uncertainties and appeared more confident in expressing their clinical reasoning with SNAPPS method. SNAPPS model has proven itself not only as a good assessment tool that it was originally intended to be, but also as a strong teaching and learning method as well. Another big advantage of SNAPPS method was as the facilitator was hearing the uncertainties brought up by the student, they could identify the weak points in thought process of a student and provide immediate constructive feedback tailored at improving the student's reasoning and help him to formulate a hypothesis of his own.⁹ The fact that through the SNAPPS method students were able to outline better management plans compared to the OMP method would be due to this process of clarification of uncertainties during the time of discussion in the former.

Regarding self evaluation, the students found it easier to present cases with both methods. Majority of students found it easier with SNAPPS to speak out about all difficulties concerning patients, hypothesize differential diagnosis, identify case based learning issues for self study, bring up uncertainties in case and lead the case discussion by taking active initiative. In the overall rating of these methods also the students had rated SNAPPS ahead of OMP. This preference towards SNAPPS may be because it is a learner centered process with active participation of the students which motivates and encourages them to bring up more uncertainties and differentials themselves. This findings were slightly different from a study conducted on student perception alone towards OMP and SNAPPS along with a few other models of case presentations where OMP and SNAPPS showed similar acceptability which were much more than other case presentation models like Aunt Minnie model, activated demonstration model and traditional case presentation model.¹⁰ However better appreciation of SNAPPS did not mean OMP was an inferior method of teaching as the median ratings of OMP were also very high on the perception chart. There was not even a single 'strongly disagree' marked and a very few 'disagree' were marked in the entire SNAPPS and OMP perception scales which showed the positive appreciation by the students for both the methods.

Limitations

Only four department post graduates and simulated cases were utilized for this study. Results may vary with other department post graduates

and real patient scenarios. There was a pocket card given to all the students highlighting steps of SNAPPS. That would have biased the study initially as students were allowed to refer pocket card to go through steps of SNAPPS, however after one month the pocket card was not referred to as students were well versed with the steps themselves. The next limitation was interpreting student initiative was subjective as no tools were devised for the same. However the limitation was tackled to some extent as there were only two principal investigators. Fourth limitation is both these methods may not be an ideal undergraduate teaching or assessing tool where traditional case presentation is always considered the best.

CONCLUSIONS

Both SNAPPS and OMP methods improve the critical thinking and clinical reasoning of a postgraduate, make case presentations easier for them and make them more confident about their clinical judgment and formulation of management plans. SNAPPS is better than OMP as a teaching learning method and as an assessment tool both quantitatively and qualitatively. Teachers must try newer and interesting teaching learning methods like SNAPPS and OMP to improve confidence, critical thinking and clinical reasoning of their students.

Financial support & Sponsorship: Nil

Ethical conflicts: Nil

Conflicts of Interest: Nil

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