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Evaluation of the one-minute preceptor as a teaching method for family medicine residents

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Abstract

Background and objective: Health professionals struggle to appropriately train resident doctors in overcrowded medical centers. The one-minute preceptor teaching approach is an effective teaching model that provides a solution to the problem. This study aims to determine the effectiveness of a one-minute preceptor in improving the clinical teaching skills of supervisors and the critical thinking skills of residents and to assess the residents' and supervisors' attitudes toward a one-minute preceptor.

Methods: From October 1, 2021, to February 28, 2022, a cross-sectional study was conducted in the Family Medicine department at Hawler Medical University, in Erbil, Iraq. Eight family medicine supervisors and 30 resident doctors at the specialized Family Medicine Health Center were involved in the study. Pre-and-post assessment questions were administered to the supervisors before and after one-minute preceptor training to assess their knowledge. Kirkpatrick's evaluation model was used to evaluate supervisors' knowledge and application of skills after training, and to assess whether intended outcomes occurred with the residents.

Results: All supervisors agreed that this approach to teaching should be incorporated into medical education (50% agreed and 50% strongly agreed) and improved their teaching skills (75% agreed, 25% strongly agreed). More than half of the residents agreed that this new teaching method should be incorporated into medical education. (50% agreed and 10% strongly agreed)

Conclusion: The one-minute preceptor teaching model intends to provide doctors with an effective framework to improve their instructional effectiveness.

Keywords: One Minute Preceptor; Family Medicine; Kirkpatrick Model.

Introduction

Medical residents are required to handle patients in a busy workplace in addition to reading for their academic ambitions.[1] Moreover, the residents require sufficient direction, training, and assessment to benefit from a suitable learning program.[1] Too often, clinicians struggle to adequately teach residents in outpatient settings due to busy, overcrowded medical centers.[2]

Traditional teaching methods lack the interactive dialogue between supervisors and residents, focusing on memorizing information, asking non-specific questions, and teaching in small classes while teaching over the patient without providing feedback.[1,3] Different teaching methods have been produced to help fill the gaps in clinical teaching. The "One Minute Preceptor" (OMP) has proven to be a successful training method and provides a solution to the defects in clinical teaching.[4] OMP is a learner-centered tool developed around 30 years ago.[5]

It emphasizes on improving the clinical thinking and reasoning skills of resident

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doctors in busy medical centers to reach a diagnosis and management plan successfully.[6] OMP consists of 5 micro-skills that are easy and clear to understand, which include (1) Gain a commitment: Supervisors ask resident doctors what their diagnosis is after they take a patient's history. Supervisors should motivate resident doctors to apply clinical decision-making and critical thinking skills. (2) Search for supporting evidence: It is important to know whether the resident doctor's answer came from personal knowledge or guessing. Resident doctors are asked how or why they chose this diagnosis. (3) Teach a general rule: It is important to educate resident doctors with information from the supervisor's knowledge and experience for better clinical decision-making in the future. (4) Provide positive feedback. Supporting good effort by informing the resident doctor they did well in remembering certain details will encourage them to do better in the future. (5) Correct errors: Supervisors advise resident doctors regarding medical mistakes respectfully to improve knowledge.[7]

The first two micro-skills focus on clinical reasoning and knowledge, and the last three micro-skills focus on providing information for learning.[7] Furthermore, this model concentrates on the last minute of the teaching encounter, as it is the most crucial minute for learning.[3] Moreover, the supervisor not only focuses on the areas that were done well by the residents but also gives feedback on learning needs. Current global health policies focus on strengthening primary health care;[8] therefore, the decision was made by the World Organization of Family Doctors to teach family medicine in every medical school.[9] Implementation of traditional teacher-centered education lacks diversity in areas of learning.[10] Often, clinical reasoning skills with a lack of supervisors' feedback are expected to be adapted for the first time in clinical rotations, which limits the ability to accurately reach adiagnosis.[11] While with OMP, both supervisors and resident doctors can assess defects, improving the quality of teaching by providing feedback to residents.[6]

This study aims to determine the efficacy of OMP in improving the clinical teaching skills of supervisors and the critical thinking skills of residents and to assess their attitudes towards OMP.

Methods

Study Design: A cross-sectional quantitative study was done in the Family Medicine Residency Program of Hawler Medical University, Erbil, Iraq.

Study Population and Setting: Eight family medicine supervisors and thirty resident doctors at the specialized Family Medicine Health Center participated in the study between October 1, 2021, and February 28, 2022.

Data Collection: A workshop with a role-play about OMP was delivered to supervisors. Pre- and post-testing assessments, which consisted of ten modified MCQs, were given by the researchers to examine the change in overall knowledge. [12]

The two weeks after training, residents presented real cases to supervisors in the outpatient clinic, and supervisors evaluated them using the five micro-skills of OMP, Figure 1.

Kirkpatrick's evaluation model was used to assess the effectiveness of OMP.[13] Level 1 evaluates how the supervisors felt towards OMP using a 5- point Likert Scale perspective questionnaire. In level 2, pre and post-test results were analyzed. Level 3 assessed the supervisors' change in behavior during the study duration. While level 4 was assessed through the residents' perspective questionnaire, which evaluates improvement in residents' critical thinking and clinical reasoning skills.

Ethical considerations: This study was approved by the Hawler Medical University/ College of Medicine Research Ethics Committee on January 4, 2022 (NO. 10).

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The residents and supervisors gave their written consent to participate in the study.

Statistical analysis: Statistical Package for Social Sciences (SPSS, version 25) was used for data analysis. Numerical variables were represented as means and standard deviations, and categorical variables as frequencies. The McNemar test was used to compare the proportions before and after the workshop (for the same sample).

A Wilcoxon signed-rank test was used to compare the median knowledge scores calculated before and after the workshop. *P*-value ≤0.05 was considered statistically significant.

Results

Eight supervisors participated in the study. Five (62.5%) were aged 40–49 years, and five (62.5%) were females. Thirty residents were included in the study; their mean age (±SD) was 32.8 ± 3.8 years, ranging from 28–40 years. Details of other characteristics are shown in Table 1.

Table 1 Basic characteristics of the studied sample of residents and supervisors.

Residents	No. (%)	Supervisors	No. (%)
Age		**Age**	
<30	6 (20.0)	30-39	2 (25.0)
30-34	17 (56.7)	40-49	5 (62.5)
≥35	7 (23.3)	50-59	1 (12.5)
Gender		**Gender**	
Male	3 (10.0)	Male	3 (37.5)
Female	27 (90.0)	Female	5 (62.5)
Residency program		**Degree**	
Kurdistan board	7 (23.3)	M.B.Ch.B	1 (12.5)
Arabic board	19 (63.3)	Board	6 (75.0)
Higher diploma	4 (13.3)	Masters	1 (12.5)
Years of clinical experience (n=29)		**Years of clinical experience**	
<5	6 (20.7)	<10	1 (12.5)
5-9	17 (58.6)	10-9	3 (37.5)
≥10	6 (20.7)	>20	4 (50.0)
Total	30 (100.0)	Total	8 (100.0)

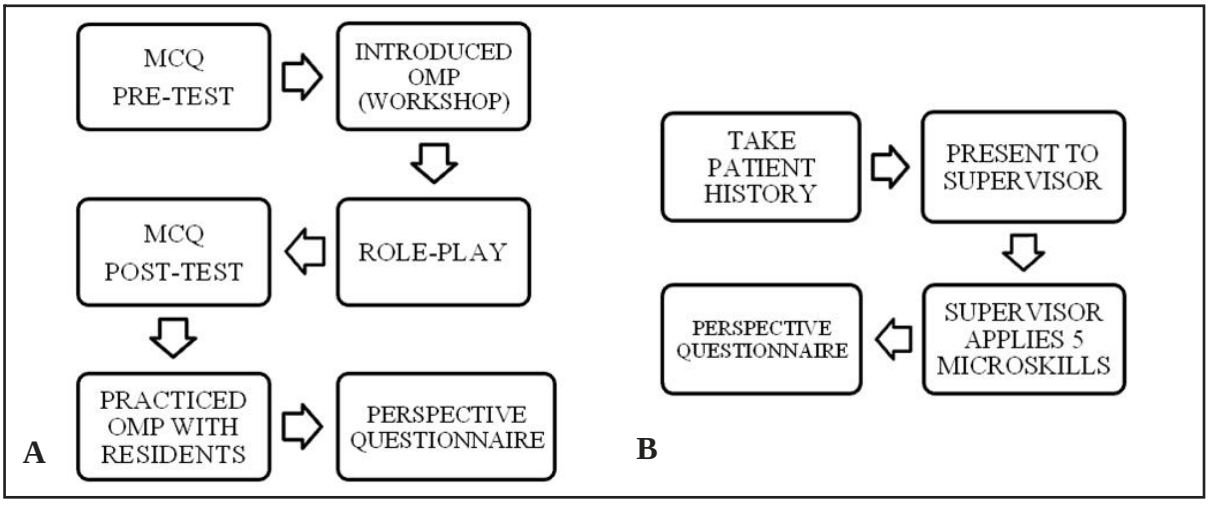

Figure 1 (A) Process of introducing OMP to supervisors. (B) Process of introducing OMP to residents.

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According to KirkPatrick Levels, Level 1 Reaction: Supervisors enthusiastically engaged in the training workshop. Level 2: Learning: All eight supervisors were asked to answer MCQs before and after the, workshop. For all questions tested on OMP knowledge, all supervisors scored 100% compared to low scores in the pre-test MCQ, Table 2.

Table 2 Rates of correct responses before and after the workshop.

	Correct response		
	Pre-test (n=8)	Post-test (n = 8)	
Questions	**No. (%)**	**No. (%)**	***P***
OMP Model consists of 5 micro-skills.	3 (37.5)	8 (100.0)	NA
Assessment is NOT a step of OMP.	4 (50.0)	8 (100.0)	NA
The most important question asked when getting a commitment is;what is your diagnosis?	2 (25.0)	8 (100.0)	NA
The most important question asked when searching for supporting evidence is; how did you get your diagnosis?	5 (62.5)	8 (100.0)	NA
The purpose of teaching a general rule is to give information for better patient care in future clinical encounters.	3 (37.5)	4 (50.0)	>0.999
The purpose of giving positive feedback is to motivate the resident doctors to do better in the future.	2 (25.0)	7 (87.5)	0.063
The purpose of correcting mistakes is to learn from them and not to repeat them.	5 (62.5)	6 (75.0)	>0.999
OMPwas initially implemented in medical training, is learner-centered, and originated from theoretical and clinical training.	1 (12.5)	4 (50.0)	0.250
OMP model involves, gaining commitment, giving general rules, and correcting mistakes.	5 (62.5)	8 (100.0)	NA
The principle of clinical teaching in OMP includes reinforcement, participation, and repetition, to improve the application of theoretical and clinical knowledge through various learning activities.	8 (100.0)	6 (75.0)	NA

NA: Not applicable; comparison is done with 100% response.

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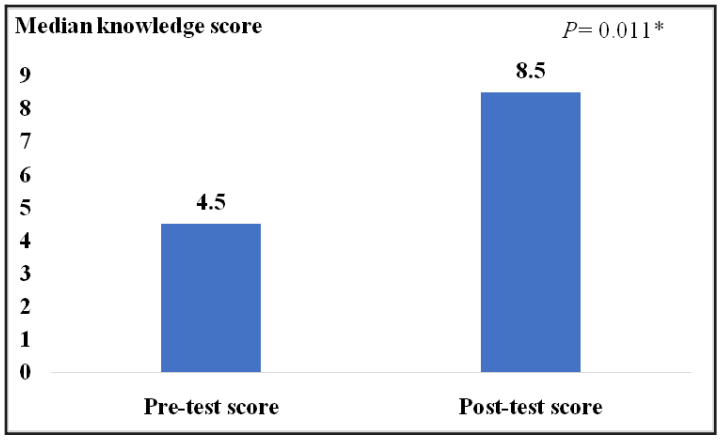
The median knowledge score was 4.5 before implementing the training program, but it significantly increased to 8.5 after the program (P = 0.011) (Figure 2).

The minimum score overall was 1 before the workshop and increased to 7 after the workshop. The maximum score was 9 and 10 before and after the workshop, respectively. The mean, minimum, and maximum values increased after implementing the workshop.

Level 3: Transfer: Almost all supervisors were satisfied with OMP and believe it is a good teaching method and better than other methods. They believe this method is going to improve the skills of residents. No supervisor thought OMP took too much time, Table 3.

Table 3 Supervisors' perspectives about the new teaching method.

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
	No. (%)	No. (%)	No. (%)	No. (%)	No. (%)
I was at ease with OMP	1 (12.5)	0 (0.0)	0 (0.0)	3 (37.5)	4 (50.0)
OMP was different than other teaching methods	0 (0.0)	1 (12.5)	0 (0.0)	6 (75.0)	1 (12.5)
OMP is better than other teaching methods	0 (0.0)	0 (0.0)	2 (25.0)	5 (62.5)	1 (12.5)
OMP takes too much time	1 (12.5)	6 (75.0)	1 (12.5)	0 (0.0)	0 (0.0)
OMP encourages residents to broaden their knowledge	0 (0.0)	0 (0.0)	1 (12.5)	5 (62.5)	2 (25.0)
OMP reveals residents' weakness and strengths	0 (0.0)	0 (0.0)	0 (0.0)	5 (62.5)	3 (37.5)
OMP leads to better clinical thinking skills	0 (0.0)	0 (0.0)	0 (0.0)	6 (75.0)	2 (25.0)
OMP improves my clinical teaching skills	0 (0.0)	0 (0.0)	0 (0.0)	6 (75.0)	2 (25.0)
OMP helps residents be more responsible in patient care	0 (0.0)	0 (0.0)	1 (12.5)	6 (75.0)	1 (12.5)
OMP should be part of our medical education	0 (0.0)	0 (0.0)	0 (0.0)	4 (50.0)	4 (50.0)



*By Wilcoxon signed-rank test

Figure 2 Median knowledge scores before and after the training program.

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When asking the supervisors about the degree of importance of the skills gained through OMP, all of them believed that all micro-skills are important (very much or extremely) except for two supervisors who answered with 'somewhat' regarding 'gaining a commitment' skill.

Half (50%) of the supervisors believed that 'correcting mistakes' is the most important micro-skill, two (25%) believed that 'searching for supporting evidence' skill is the most important, and the rest (25%) believed that 'teaching a general rule' skill is the most important.

A maximum of 5 scores was given for each of the 10 questions, Table 3.

The mean score (±SD) for the opinion of the supervisor was 4.14 ± 0.34, and the median was 4.1. The range of the score was 3.7 to 4.6. The 95% confidence interval was 3.90-4.37.

Level 4- Results: The residents' perspectives on the new teaching method have been assessed and the results are presented in Table 4 where a five-point Likert scale was used. The table shows that most residents either support the new teaching method, or were neutral, while three (10%) residents didn't believe the new method is time-efficient, and two (6.7%) residents didn't believe the new teaching method is better than other teaching methods, Table 4.

Note: The residents were not trained or given information regarding OMP. A total of 27 (90%) residents have noticed a change in the method of teaching, but none of them knew the name of the new method. Nearly two-thirds (63.3%) of residents believe reaching a diagnosis and management plan is the most important skill learned in the new teaching method, and 5 (16.7%) think correcting mistakes is the most important skill. The mean ± SD of the perspective score (with a maximum of 5 scores) was 4.0 ± 0.511. The median was 4, and the range was from 2.6–5.

The confidence interval of the mean was 3.82–4.18.

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Table 4 Residents' perspectives about the new teaching method.

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
	No.(%)	No.(%)	No.(%)	No.(%)	No.(%)
I was at ease with the new teaching method	0 (0.0)	1 (3.3)	8 (26.7)	14 (46.7)	7 (23.3)
New teaching method is different than traditional teaching methods	0 (0.0)	0 (0.0)	12 (40.0)	15 (50.0)	3 (10.0)
New teaching method is better than traditional teaching methods	0 (0.0)	2 (6.7)	13 (43.3)	11 (36.7)	4 (13.3)
New teaching method is time efficient	0 (0.0)	3 (10.0)	8 (26.7)	15 (50.0)	4 (13.3)
New teaching method encourages me to broaden my knowledge	0 (0.0)	1 (3.3)	4 (13.3)	13 (43.3)	12 (40.0)
New teaching method helps me integrate theoretical with clinical knowledge	0 (0.0)	1 (3.3)	6 (20.0)	13 (43.3)	10 (33.3)
New teaching method leads to better clinical thinking skills	0 (0.0)	1 (3.3)	3 (10.0)	16 (53.3)	10 (33.3)
New teaching method improves my practical skills	0 (0.0)	1 (3.3)	5 (16.7)	15 (50.0)	9 (30.0)
New teaching method reveals my weaknesses and strengths	0 (0.0)	1 (3.3)	5 (16.7)	16 (53.3)	8 (26.7)
Supervisor asked me about diagnosis and management plan	0 (0.0)	0 (0.0)	2 (6.7)	21 (70.0)	7 (23.3)
I was motivated to use critical thinking	0 (0.0)	0 (0.0)	6 (20.0)	16 (53.3)	8 (26.7)
Supervisor asked for supporting evidence regarding my answer	0 (0.0)	0 (0.0)	4 (13.3)	18 (60.0)	8 (26.7)
My mistakes were corrected by the supervisor	0 (0.0)	0 (0.0)	6 (20.0)	15 (50.0)	9 (30.0)
Positive feedback was provided by the supervisor	0 (0.0)	1 (3.3)	2 (6.7)	20 (66.7)	7 (23.3)
This new teaching method should be part of our medical education	1 (3.3)	0 (0.0)	4 (13.3)	15 (50.0)	10 (33.3)

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Discussion

Family doctors focus on patient care through a holistic approach to treating the most common diseases.[14] Therefore, one of the most significant aspects of medical education is training. Certain training programs that incorporate clinical and theoretical case-based knowledge increase residents' confidence and ability to independently take on patient management.[15] This study aimed to introduce the OMP method to family medicine doctors and evaluate the outcomes and efficacy using the Kirkpatrick Model, which is a suitable tool for assessing training programs.[16]

There was a significant improvement in the knowledge of OMP after participating in the workshop, as reported by the supervisors in the study. The supervisors perceived a positive response to OMP. Most agreed that OMP was time-efficient, discovered residents' strengths and weaknesses, and improved residents' clinical thinking and reasoning skills. In comparison, a study by Chandra et al. (2020) shows that there was an overall satisfaction of educators with the OMP in terms of time efficacy, revealing residents' weaknesses and strengths, and improving their reasoning skills.[7]

The residents believe their critical thinking skills were improved with OMP. Similar to this, a study by Machado and Medeiros (2021) found that OMP trainees had significantly improved critical thinking skills.[17] This finding could be due to providing feedback, which leads to an improvement in teaching-learning practice.[18] The application of OMP skills in clinical training can help increase the value and level of instruction while also contributing to the effectiveness of a training course.[19] The same was observed in this study, where most residents and supervisors stated that the new teaching model is more effective than other traditional teaching methods. This finding was in concordance with a previous study by Aggarwal et al. (2018), in which OMP was regarded as more successful than traditional practices.[20]

Furthermore, residents appreciated the implementation of the five micro-skills of OMP in clinical practice; however, they did not have much knowledge regarding the teaching method. In a study by Ong (2016), the most important skills were teaching general rules and correcting mistakes.[21] In contrast, for this current study, the residents perceived reaching a diagnosis or management plan and correcting mistakes as the two most important skills. This difference might be because residents want their mistakes corrected to improve their abilities as well as be able to accurately provide a diagnosis.[18]

Teaching a general rule may be preferred over other micro skills, according to Ong (2016), to ensure adequate knowledge is received in a short amount of time within outpatient clinics in that locality.[21] The study successfully introduced OMP and provided real-life cases. However, the study included a small sample size of thirty family medicine resident doctors and eight supervisors in only one healthcare center. Therefore, due to these limitations, the results may not be pervasive.

Conclusion

It is intended that OMP offers clinicians an effective context to increase their teaching efficiency within busy medical environments with residents. Additionally, since OMP is learner-centered, all supervisors and most residents favor this model over traditional methods. Even though most of the studies are focused on other medical fields, it is reasonable to recommend that family medicine supervisors apply OMP as a teaching approach. Moreover, additional research is needed to assess the OMP model's long-term efficiency among family medicine doctors.

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Competing interests

The authors declare that they have no competing interests.

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