THE DEVELOPMENT AND EVALUATION OF A NURSING ONE-MINUTE PRECEPTOR PROGRAM IN TAIWAN

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ABSTRACT:

The One-Minute Preceptor is a tool that is relatively easy to learn and apply in the clinical setting by medical doctors, , but little is known about the effects on clinical nursing preceptors. **Study Aim** was to develop and evaluate the effects of a One-Minute Preceptor program on the clinical nursing preceptors in Taiwan. **Method**: quasi-experimental design with a purposive sample, including two categories of study subjects-nurse preceptors, and their preceptees the new nurses. Sixty participants were reandomly assigned into the experimental and control groups with 35 and 25 subjects. **Tool**: Objective Structured Teaching Exercise(OSTE) rating score, and subjective structured questionnaires of novice nurse's self-evaluation to assess the benefit of the preceptor's teaching. **Results**: the average OSTE scores of experimental group on two assessments were higher than those in the control group (p < .001 ; p < .001). The OMP program in this study could enhance the teaching competency of the nursing preceptors. The novice nurses in the experimental group felt more benefited from the preceptors, who had received intervention at test two, than those in the control group. The study result showed an objectively structured nursing OMP Program can effectively improve their teaching ability and enhance their subjectively evaluated benefit level for new nurses.

*Key words***:** Nurse Preceptor, One-minute Preceptor, OMP, Objective Structured Teaching Exercise, OSTE.

INTRODUCTION

It is recognized that nursing preceptors, who have the ability to teach, support,and provide feedback to the novice nurse, play an essential role in their learning process(Happell, 2009). However, many nursing preceptors often have limited time to teach in clinical settings, and limited training in effective teaching methods for this important clinical teacher role. The One-Minute Preceptor(OMP) is a tool that is relatively easy to learn and apply in the clinical setting by medical doctors, but little is known about the effects on clinical nursing preceptors. The objective structured teaching exercise(OSTE) is similar to objective structured clinical examination(OSCE), use of standardized teaching situations and standardized students to develop direct measures of preceptor's teaching performance.

LITERATURE REVIEW

In 1992, Neher initiated a "Five-Step Microskills Model" as a clinical teaching model for family physicians, which also known as the One-Minute Preceptor (OMP), which applied a learner-centered dynamic teaching approach in clinical practice. Because it is an easy way to learn and utilize by practitioners, it has been widely and successfully applied in clinical teaching (Furney et al, 2001; Neher, Gordon, Meyer & Stevens, 1992; Neher & Stevens, 2003). The five steps include to: 1) Get a commitment by asking open questions to encourage learners to express issue-related contents in order to identify problems; 2) probe for supporting evidence by asking direct questions to evaluate learners' knowledge and assess learner's clinical inferential and evidence finding ability: 3) teach general rules; 4) reinforce what was done right; and 5) correct any mistakes encountered. There is no specific order to follow on utilizing these five-step microskills. The fourth and fifth steps are skills to facilitate a bilateral communication and

positive feedback. The advantages in applying for the Five-step Microskills Model are to help clinical preceptors become capable to give correct diagnosis and assessment ability of learners, to encourage self-learning, to encourage learners to make conclusions and formulate plans , to give positive feedback, and to give feedback more frequently (William, 2006). Most of the researchs of OMP technique were forcused on physicians (Eckstrom, et al., 2006; Gallagher, et al., 2012) . Only a few articles were about developing nursing OMP courses. In 2004, 20 nurse preceptors were invited to participate in a one-hour education program from a 350-bed regional hospital in Northwest Pennsylvania. The program included lectures on introducing the course objectives, OMP's five-step teaching skills, and role-play in simulated clinical teaching scenarios. Thereafter, preceptors had to complete the questionnaire concerning their teaching ability before and after participating the program. The results showed that taking the OMP program could improve their teaching skills. The OMP teaching model is an effective teaching method which proved to be easy to learn and apply in clinical practice (Kertis, 2007). Bott applied OMP on teaching program for college-graduated nurses and renamed teaching skills as Five Minute Preceptor (5MP); moreover, the step 1, "get a commitment" was revised as "get the student to take a stand". Unlike the physician education which emphasizes more on diagnosis and treatment, the features of nurse training are comparable to the extent that may include assessment, health problem management, and collaborative nursing care. Bott also suggested that a set of 5MP DVD consists of role-play, interactive exercise and operation review should be further tested in the future nurse preceptor training (Bott, Mohide, & Lawlor, 2011).

When constructing a OMP program for nurse preceptors, the specially customized measurement tools are also required to

access teaching skills. Most of the pedagogical performance of clinical preceptors after OMP training has been accessed by questionnaire survey(Eckstrom, et al., 2006; Gallagher, et al., 2012; Kertis, 2007), The studies of Edwards et al., (1988), Dunnington et al., (1998),Furney et al., (2001), Morrison et al., (2003) and Chan et al., (2015) used variable formal skill sessions varied from one half-day teaching seminar to a seiers of 1-hour workshops,including group discussion and role play to improve resident teaching ability. Wung et al., (2012) conducted a single-group quasi-experimental study at a medical center of northern Taiwan. Fifteen clinical preceptors were recruited in the study with a one-day advanced training workshop. Two OSTE pre- and post- tests at each faculty observers station were conducted. A one-hour OMP teaching techniques session was also given. The teaching ability showed a statistically significant differences (p < .001) between the two groups after receiving the intervention. The results of these studies demonstrate that teaching workshops can improve the resident teaching skills as measured by OSTE scores.

According to the estimate of the Learning Retention Pyramid(LRP)(The Learning Retention Pyramid,2016) that attendance at a lecture produces an average 5 per cent retention of learning(the lowest). Wheras at the other end of the spectrum a student practice what they learned increases that average to 75 per cent retention. Objective Structured Teaching Examination (OSTE) is an impartial estimation tool to assess the performance of nurse preceptors' practice to teach on standardized students under a simulated instructional situation. By adopting OSTE, preceptors could perform tutoring without worrying about hurting or affecting students' learning in a safe environment. Each assessment station has faculty observers who will rate and give feedback to test takers. Case design for OSTE is usually based on the common teaching situation or from student feedback. The context may occur in discussion rooms, treatment settings, wards, and classroom or teaching sites. Regarding the OSTE rating design, the content should be based on the purpose of the test, the content of teaching knowledge, teaching technique and teaching ability, and the faculty observers have to follow the objective rating criteria to evaluate preceptors and give them feedback. Since 1992, the OSTE has been widely used and valued as an assessment method for many educational institutions and hospitals. By adopting OSTE, teachers could not only inspect their teaching skills, but obtain feedback from colleagues or standardized students, by which, teachers' competency and teaching effectiveness could be improved as well. In addition, OSTE could also be used as the pre- and post- tests for course development in order to assess whether teachers have applied learned knowledge to OSTE cases after participating the program (Morrison et al., 2006; Liu & Liu, 2006).

Based on the above literatures, the nurse preceptor plays a significant role in shaping new nurses's performance in the workplace and enhancing their learning processes. By applying OMP, the preceptors' teaching ability can be improved. Moreover, the OSTE can be used to objectively assess clinical teaching performance and further enhance the instructional effectiveness.

Aim of study:
To develop a Nusing OMP Program for nurse preceptors and to evaluate it's effectiveness on preceptors' teaching competence by OSTE, and the self-benefited level of perceived benefit by new nurses.

Study hypothesis:
It is hypothesized that, a Nursing OMP Program, careful evaluation by OSTE could improving nurse preceptors's teaching skill and practice.

Methodology
Study design
From March to July, 2012, the study adopted single-blind, quasi-experimental design with purposive sampling and random distribution, in which sixty of each category of subjects, new nurses and preceptor, were recurited from a medical center in northern Taiwan. 35 from each kind were randomly assigned to the experimental group and 25 were appointed to the controlled group. One month after new nurses on board, both groups of preceptors were invited to attend the preceptor workshop and pre-tests were given. Preceptors from the experimental group not only had to complete the OSTE on the topic of "Management of hypoglycemia patient", but attended a two-hour course of OMP program, which including OMP techniques, clinical application, and feedback discussion. In the experimental group, preceptors had to complet three times of OSTE and OMP program once every month, however, those preceptors on the controlled group received three OSTE programs only without having OMP program (Table 1).

Every preceptor would be graded on OMP teaching competence after each OSTE by two faculties. One month after preceptors had completed the OSTE, new nurses had to evaluate their professional improvement level correlated to preceptors' teaching ability. Research framework showed on Figure1.

Table 1. Research Design Nurse preceptor recruiting procedure:

Item	Pre-test		Post-test 1		Post-test 2	
Controlled group	$O1_1$		$O1_2$		$O1_3$	
Experimental group	$O2_1$	X	$O2_2$	X	$O2_3$	X

Checking time：first day of training 1 month after training 2 months after training

X: giving OMP teaching skill training program with assessment then providing feedback and discussion after each OSTE assessment

New nurse (O') recruiting procedure:

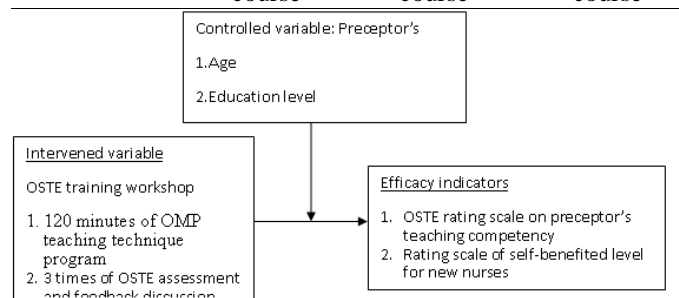| Item	Test 1	Test 2	Test 3
Controlled group	$O'1_1$	$O'1_2$	$O'1_3$
Experimental group	$O'2_1$	$O'2_2$	$O'2_3$
Checking time	1 month after the preceptor took the training course	2 months after the preceptor took the training course	3 months after the preceptor took the training course

Fig. 1 OMP Program and research framework of efficacy assessment for nurse preceptors

Tools of Data Collection:
1. The OMP Program for nurse preceptors The program included three times of OSTE and then

followed by a two-hour session of OMP technique and feedback discussion.

(1) The teaching scenario for the OSTE
The themes of the scenario have been chosen from the most often occurred clinical situations for each OSTE test station by interviewing new nurses. The three topics selected include: hypoglycemia management, instruction of Ampicillin delivery and skin test, and handoff report for the patient who was transferred from general ward to intensive care unit. To implement the program, we referred to the advanced OSCE education guidelines (2009) issued by Taiwan medical education in which six items were included which were bulletin board, the instructions for raters and preceptors, the guidelines and the script for standard students, and rating scale, besides, the clinical case scenario. Scales would be the focus on the utilization of the OMP's five teaching skills.

(2) OMP Program-This 2-hour program referred to the OMP which developed by Neher in 1992, including five steps of clinical teaching skills and clinical scenarios.

2. OSTE rating scale of OMP technique for nurse preceptors
Research team members referred to the literatures and teaching scenarios designed a rating scale for faculty observers to grade the preceptors performance during OSTE. There were five areas of rating scale which including the capability of focusing on the main topic, searching for the supportive evidence, introducing nursing principles, and giving positive reinforcement and correcting errors. Each teaching project contained 8 questions, and each question rated as 2 points for "accomplished", 1 for "partial accomplished", and 0 for "not done". The total score ranged from 0 to 16 points, the higher score representing the better performance in applying teaching skills.

The training on rating consistency for faculty observers: In May, 2011, two training programs for OSTE raters were conducted by 8 research members regarding rating consistency. All raters had to watch videos for 10 teaching drill cases at the same time and then graded each case by the OSTE rating scale. By the way of discussion, the rating consistent rate increased between the two raters until the similarity or reliability score reached at 80% or above.

3. Self-benefited scale of new nurses
By literature reviewed Eckstrom, Homer, &Bowen.(2006), the research team developed a scale for new nurses to evaluate their self-benefited level from preceptors who had received OSTE for a month. Preceptors' teaching techniques contributing to new nurses' professional development were assessed by new nurses with the self-benefited scale. Similarly, the scale composed of 10 questions in the Likert scale (1 to 5) was applied to score the answer for each question; the higher score, the higher level of perceived benefit.

Statistical Methods:
The statistical software, SPSS for Windows version 17.0, was used to analyze research data. Descriptive statistics include the percentage, average, minimum, maximum, and data distribution. Inferential statistics include the independent sample t-test and Chi-square test to determine the relevance of control variables for the analysis. The Generalized Estimating Equation(GEE) statistical method was used to compare the differences between groups on teaching ability after receiving OMP Program for preceptors and perceived benefits for new nurses.

Ethical Consideration:
The study was approved by the IRB committee of Taipei Veterans General Hospital Institutional Review Board(IRB-TPEVGH No:2011-12-011IC) in April 2012, An approved consent to participate form was required and signed by the nursing clinical teachers and new nurses taking part in the study.

RESEARCH RESULTS

1. Comparison of basic features between nursing preceptors
The study recruited 60 nurse preceptors who were randomly assigned into the experimental group (n=35) and the control group (n=25). Age ranged from 27 to 47 years old with an average age of 37.28 years. Educational attainment of the 53 preceptors (88.47%) was either bachelor or master degree, and 23 were in the clinical ladder II (38.3%). One month after new nurses on board, the preceptors reported that every week they engaged in teaching for a minimum of 8 hours and average of 32.38 hours with a standard deviation of 18.74 hours. The basic information about nurses from both experimental and control groups was collected and included age, education level, professional level, and the time devoted to clinical teaching per week. The variability for each of the cited measure was tested. The results showed that the preceptors' average age in the experimental group was older than in the control group (p = 0.002). There was no significant difference for the other variables. Thus, the two study groups were relatively comparable (Table 2).

Table 2 Basic features of nurse preceptors (N=60)

variable	Experimental group (n=35) No. of person (%) M±SD	Control group (n=25) No. of person (%) M±SD	p value
Education level			0.68
College	3 (8.6)	4 (16.0)	
University	26 (74.3)	17 (68.0)	
Graduate school	6 (17.1)	4 (16.0)	
Clinical professional level			0.27
II	11 (31.4)	12 (48.0)	
III	12 (34.3)	9 (36.0)	
IV	12 (34.3)	4 (16.0)	
Age	39.06±5.06	34.80±5.22	0.002*
The time involved in	①35.69±17.88	①27.74±19.28	0.11
	②30.35±17.69	②21.91±14.15	0.07
	③26.16±16.97	③28.67±25.37	0.68

Remark: 1.* p<0.05

2. Adopted independent sample t-test to check continuous variables, and Chi-square test to exam categoric variables.

3. The time involved in teaching in a week: ①represents preceptors who received the first time of training (when new nurse on board for two months); ②represents

preceptors who received the second time of training (when new nurse on board for three months); ③represents preceptors who received the third time of training (when new nurse on board for four months).

2. Comparison of basic features between new entrants(Table 3)

The study was designed to enroll sixty new nurses; however, seven of them resigned or transferred to the outpatient department as contracted nurses within three months. Therefore, it became 53 new nurses participated in this study in which 33 assigned to the experimental group, and 20 of them were distributed to the control group. Forty-eight of new nurses were female (90.4%). The youngest was 22 years old, and the oldest was 31. The mean age was 23.74 years old (SD = 2.34). All of the new nurses were college educated with similar work shifts and average time of discussion with their preceptors. Both groups were checked when entrants on board for two months, three months and four months which found no significant difference between groups. However, by increasing the number of on board days, both groups of new nurses had less same shift with their preceptors and so did on discussion time. From Table 3, the basic features of new nurses which including gender, age, education level, working on the same shift and the amount of discussion time with preceptors, revealed no significant difference between two groups which represented the experimental and the control groups were relatively homogeneous.

Table 3 Basic features of new entrant nurses (N=53)

variable	Experimental group (n=33) No. of person (%) M±SD	Control group (n=20) No. of person (%) M±SD	p value
Gender			0.28
Male	2 (6.1)	3 (15.0)	
Female	31 (93.9)	17 (85.0)	
Education level			
University	33 (100)	20 (100)	
Age	24.0±2.52	23.3±2.00	0.30
No. of days that new nurses had same shift with their preceptors	①11.64±7.02	①11.70±4.63	0.97
	② 9.41±5.99	② 8.21±5.09	0.47
	③ 7.09±6.13	③ 5.29±5.93	0.29
The time to discuss with preceptor in this month	① 8.73±9.22	① 8.10±5.24	0.78
	② 7.06±5.58	② 4.47±3.18	0.70
	③ 7.00±6.74	③ 4.45±4.88	0.12

Remark:

1. Applied independent sample t-test to check continuous variables, and chi-square test to check categorical variable.

2. The number of days that new nurses had same shift with their preceptors/ the time discussed with their preceptors in this month: ①represents one month after preceptors received training (when new nurse on board for two months); ②represents two months after preceptors received training (when new nurse on board for three months); ③ represents three

months after preceptors received training (when new nurse on board for four months).

3. Changing of the preceptor's OMP technique Nurse preceptors measured by the OSTE average score before receiving OMP Program had an average score of 3.51 points in the experimental group and 4.01 points in the control group although no statistically significant difference was observed (p = .53). In other words, the reference points were equal for both groups before apply the intervention. The OSTE scores of the control group on post-test 1 and post-test 2 which were slightly lower than pre-test, measured 3.48 and 2.95. However, the change between the two test scores had no statistical difference (p = .54, p = .25). There was no time growth effect in the control group. On the other hand, one month after the intervention, nurse preceptors in the experimental group had an average score of 7.17 and 7.66 two months latter. The effects of age and checking times were analyzed by the GEE statistical method. The result revealed that the experimental group was significantly better than the control group and reached statistically significant difference (p < .001, p < .001) (Table 4, Figure 2). Evidently, it suggsts that the OMP Program did improve OMP technique of nurse preceptors.

Table 4. Comparison the change on teaching ability between two groups of preceptors (N=60)

| Variables	Regression coefficient	Standard error	T value	P value
Pre-test of the control group	4.01	1.69	2.37	
Pre-test (experimental/ control groups)	-.50	.79	-.63	.53
Control group (post-test 1/ post-test 2)	-.53	.86	-.62	.54
Control group (post-test 2/ pre-test)	-1.06	.91	-1.16	.25
Difference of slopes from pre-test to post-test 1 between 2 groups	4.19	1.11	3.77	.001***
Difference of slopes from pre-test to post-test 2 between 2 groups	5.21	1.16	4.50	.001***
Age	.01	.05	.73	.47

***p<.001
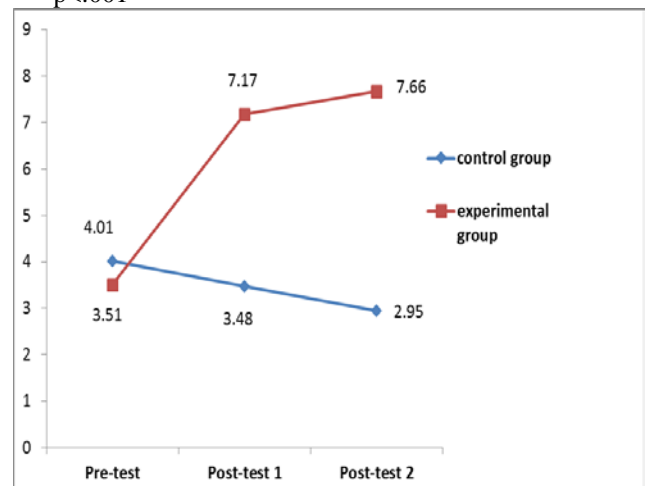
Fig. 2 The change of preceptors' teaching ability

4. The change of self-benefited level in new entrant nurses

The average score of perceived benefit on new nurses in the experimental group, checked before whose preceptors received OMP Program was 4.25, and 4.47 for those new nurses in the control group. The difference between the two groups was not statistically significant. The average scores of self-benefited level of the control group on the test two and thetest three were 4.12 and 4.15, respectively. No statistically significant difference was observed (p=.13) (Table 5, Figure 3). After applying the intervention to preceptors in the experimental group on the first month, the self-benefited level of new nurses in the experimental was better than in the control group. However, there was no delayed effect on the results checked on test three.

Table 5 The change of self-beneficial level in new entrant nurses (N=53)

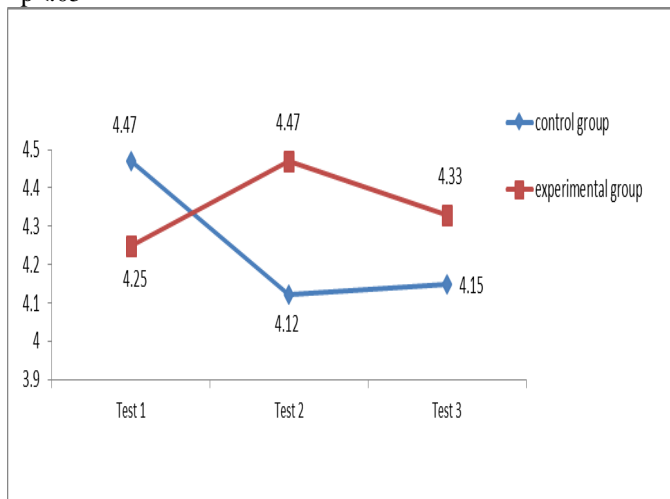| Variables	Regression coefficient	Standard error	T value	*P* value
Test 1 of control	4.47			
Test 1 (experimental/ control groups)	-.22	.19	-1.15	.25
Control group (test 2/ test 1)	-.35	.21	-1.67	.10
Control group (test 3/ test 1)	-.32	.21	-1.53	.13
Difference of slopes from test 1 to test 2 between 2 groups	.58	.27	2.14	.03*
Difference of slopes from test 1 to test 3 between 2 groups	.40	.27	1.51	.13

*p<.05

Fig. 3 The change of self-benefited level of new nurses

DISCUSSION

1. The change in the preceptors' OMP technique
   Regarding OMP technique improvement after receiving the OMP Program, the preceptors's scores in the experimental group were higher than those in the control group. However, the scores checked on the two post-tests in the experimental group showed significant difference, which explained that the nursing OMP Program proved to be effective in enhancing preceptors' OMP teaching competence. The results confirm the findings of researchers (Eckstrom, Homer, &Bowen., 2006; Kertis,2007; Wung 2012) that the OMP can enhance the teaching skills of preceptors, and the OMP Program had

been proved to be easy to learn and apply clinically. Moreover, it was an effective teaching method. Different from the study conducted by Kertis (2007) who used questionnaire to evaluate the OMP technique only once after preceptors participated in the program without continuing follow-up. This study provided OSTE continuous assessments in the second and the third months after preceptors's participation in the program. Thus, it could precisely substantiate the efficacy of applying the objectively structural training program to promote the preceptors' teaching competency.

2. The change of self-benefited level in new nurses
   New nurses in the experimental group reported that whose self-benefited level were rated higher than nurses in the control group when one month after preceptors had received intervention of OMP Program. The results of first month confirm the findings of the study conducted by Chan, Yang, & Irby (2015) that more student reported improvements in faculty teaching behaviors following the intervention. However, regraded one month later, there were no differences at test three between both groups, the result was the same as Eckstrom, Homer, & Bowen.(2006) that the residents reported no significant improvements in faculty teaching behaviors following the intervention, which could be due to the new nurses had been on-boarded for four months, they became more familiar to the professionals and spend much less time with their preceptors, beside, personal characteristics may also affect the perception of the beneficial level of learning.

CONCLUSION

This study shows that the OMP Program can improve the teaching ability of nurse preceptors. Moreover, new nurses in the experimental group rated higher than those in the control group on the perceived benefit level from preceptors who had intervened by receiving the intervention a month ago.

Recommendations

1. Nurse preceptors should received training of clinical teaching tools, easy to apply for their important clinical teacher role.

2. The new nurses will be benefited in their learning process from their clinical teacher if they have the ability to teach.

3. It is important for hospital adminstrators to develop the nursing OMP program, that designing teaching case under various clinical scenarios, careful evaluation by OSTE, should be conducted in order to improve nurse preceptors's teaching skill and practice.

4. This study used a purposive sample with a quasi-experimental design. The time constraints and inavailability of a representative sample from multiple study sites or medical centers prevent us to generalize the results. Future study should recruit a representative sample of nurse preceptors from different medical institutions. Thus, a randomized controlled trial could be executed to generate more insightul results for the evaluation of the effectiveness of a teaching protocol or program.

5. Future study could develop a interactive teaching simulation program to standardize the teaching protocol in order to constant improvement in nursing practice.

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