Research Article

Effect of a Designed Training of Trainers Program on Instructors' Performance in Postgraduate Family Medicine Program at Suez Canal University

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ABSTRACT

Background: The educational process entails the cooperation of two partners: The student and instructor. In medical schools, the instructor is considered a key element in the education process. Today's instructor has to be prepared for many roles and keep up with the rapid changes in education, and appropriate training in teaching and learning methods is now essential rather than a luxury.

Objectives: This study evaluated the role of Training of Trainer program in boosting the performance of Family Medicine instructors in giving oral presentations and conducting one-to-one clinical training.

Methods: We conducted a quasi-experimental study at the family medicine department in the faculty of medicine, Suez Canal University, Ismailia, Egypt. We enrolled 20 Family Medicine instructors and their performance within oral presentations and clinical training sessions was evaluated by both experts and students.

Results: According to experts' and students' evaluation, instructors' performance in oral presentations session was poor prior to the Training of Trainer program and experts' evaluation was significantly lower than that of the students by 2.8 ± 10.0. However, following the program, instructors' performance was significantly improved, and experts' evaluation became superior to students' evaluation 4.3 ± 4.1 (p=0.03). Moreover, instructors' performance in clinical training improved significantly in terms of assessment, instructions, feedback, and attitude.

Conclusion: The implementation of the Training of Trainer program has effectively boosted the performance of family medicine instructors. In order to enhance their training/teaching competencies, the training courses provided to clinical instructors should have specialized training focused on effective teaching and adult learning.

Keywords: Training of trainers; Family medicine; Performance

INTRODUCTION

The educational process entails the cooperation of two partners: the student and instructor. In medical schools, the instructor is considered a key element in the education process. Today's instructor has to be prepared for many roles and keep up with the rapid changes in education, and appropriate training in teaching and learning methods is now essential rather than a luxury [1]. Teacher training is suggested to improve the quality and professionalism of teaching [2], and therefore, faculty staff development has been receiving an increased attention and different programs have been developed to provide the clinical instructors with necessary teaching skills [3].

On the other hand, students are also an important element and have a great influence on the education process. Self-directed learning is a process in which individuals identify their learning needs, set the learning objectives, determine learning resources, choose the appropriate learning strategies, and evaluate their outcomes with or without the help of others [4]. The Accreditation Council for Graduate Medical Education (ACGME) recommended that residents should become self-directed learners, evaluate their learning with innovative tools such as computerized diaries and portfolios, and facilitate the learning of others [5].

Suez Canal University is the first school to endorse the disciplines of Family Medicine and Medical Education in Egypt. One of the

main objectives in the Family Medicine postgraduate program in the department is to provide the Egyptian community with competent family physicians; and to fulfill this objective, we need to understand the way of their teaching and training. Therefore, this study evaluated the role of Training of Trainer program in boosting the performance of Family Medicine instructors in giving oral presentations and conducting one-to-one clinical training.

MATERIALS AND METHODS

Study setting and subjects

We conducted a quasi-experimental study at the family medicine department in the faculty of medicine, Suez Canal University, Ismailia, Egypt. This study was conducted after being approved by the Medical Ethical Committee at Faculty of Medicine, Suez Canal University. Moreover, an informed consent was obtained from each participant. We included every demonstrator, assistant lecturer, and lecturer working at the family medicine department.

Study procedure

The performance of the instructors was evaluated by two different groups:

- **The experts:** included experts in Family Medicine and Medical Education. They were mainly the academic supervisors of the master and doctoral degree programs. These experts helped in validating the data collection tools and the developed the Training of Trainer program. They also participated in the assessment of the outcomes of the program through evaluating the actual performance of each instructor before and after the program.

- **The students:** included 20 postgraduate students enrolled in the Family Medicine postgraduate program during the time of the study. They evaluated the performance of each instructor before and after the Training of Trainer program.

Data collection tools

The data were collected using two tools; a basic questionnaire and an evaluation checklist:

A) The basic questionnaire was used to collect the instructors' demographic and academic characteristics such as their age, gender, job position, courses they have attended along with the presentations and sessions they have given.

B) The evaluation checklist:

- **For oral presentation:** This tool was prepared by the researcher based on the presentation skills checklist for professionals developed by Anon [6]. It was used to assess instructor's presentation skills.

- It measured the ability to prepare the environment for the presentation, dressing formally to seem authoritative and persuasive, introducing self, knowledge of content, giving a preliminary overview, stating clearly the objectives, using body language appropriately, speaking at a normal pace and articulating clearly, asking questions to generate discussion, using data-show appropriately, and complying with the allocated length of time.

- **For clinical teaching:** This tool was intended to assess trainer's performance during conducting one-to-one clinical teaching with trainees in family practice centers, and to assess the ability

to give constructive feedback to trainee. The researcher adapted it from the Clinical Teaching Observation Tool (University of Kansas School of Medicine, Wichita, 2010). The checklist evaluated four aspects; the assessment of trainee regarding knowledge, instruction regarding sharing experience, giving feedback to student, and instructor's attitude during the clinical session.

- Each item of the checklist was checked as either "done" or "not done."

Study phases

The demographic and academic characteristics of the enrolled instructors were collected. Afterwards, the study was carried out in three phases; pre-intervention, intervention, and post-intervention.

- **The pre-intervention phase:** during this phase, experts and students evaluated the instructors' performance in oral presentations and clinical sessions using the relevant evaluation checklists. This was done during usual work as a trainer/teacher in postgraduate master and doctoral courses or as a tutor in clinical practice in the family practice centers. The scores given by the experts and students in the oral and clinical performance were used as baseline scores. The obtained data during this phase provided information about the knowledge gaps and the training needs that have to be considered in the construction of the Training of Trainer program. It also helped in identifying the teaching and learning methods preferred by participants to help in choosing the appropriate teaching and training methods.

- **The intervention phase:** we implemented the Training of Trainer program and the participants were informed about the objectives and schedule of the program one week in advance. It was conducted as an active participation 3-day workshop, with three to four sessions per day. The teaching methods included interactive lectures, small group discussions, practical sessions, role-play with feedback, and a 5-minute presentation for each participant.

- **The post-intervention phase:** one month after the completion of the program, the experts and the students re-evaluated instructors' performance in oral presentations and clinical sessions in real life situations using the same tools applied in the baseline assessment.

Statistical analysis

Statistical Package of Social Sciences (SPSS®) version 20 was used to analyze the data. Data were presented using descriptive statistics in the form of frequencies and percentages for qualitative variables and means and standard deviations for quantitative variables. Quantitative continuous data were compared using Student t-test in case of comparisons between two independent groups and paired t-test for dependent groups. When normal distribution of the data could not be assumed, the non-parametric Mann-Whitney test was used. Qualitative categorical variables were compared using chi-square test. Whenever the expected values in one or more of the cells in a 2×2 tables was less than 5, Fisher exact test was used instead. Spearman rank correlation was used for assessment of the inter-relationships among quantitative variables and ranked ones. A p-value of ≤ 0.05 was considered statistically significant and a p-value of ≤ 0.01 was considered statistically highly significant.

RESULTS

The instructors were predominantly over 30 years of age, females, assistant lecturers, had less than 10 years of experience in teaching and training with a mean of 5.9 years. Moreover, most of the instructors have attended courses in presentation skills (70%) and teaching skills (65%), and a smaller proportion of them have attended courses in clinical teaching (45%) and adult learning (55%) as well. The instructors have also given a mean of 7 oral presentations and 18 clinical training sessions, with means number of attendants of 21 and 17, respectively (Table 1).

According to experts' evaluation prior to the program, less than half of the instructors gave a preliminary overview (45%), stated the objectives clearly (35%), moved while speaking (25%) and moved appropriately (35%), asked the audience for questions to generate a discussion (45%), didn't use excessive number of fonts (40%), used slides with a few key words (35%), of simple design (45%), with easy-to-follow graphics (35%), and provided handouts (30%). However, following the program, instructors' performance has improved significantly in most of the evaluation's aspects. Only a few aspects didn't show significant improvement, including ensuring the training environment is provided with computer/data-show (p=1.00), appropriate seating (p=1.00), lighting (p=1.00), ventilation (p=1.00), and no noise (p=0.49), being dressed formally to seem authoritative and persuasive (p=1.00), being comfortable with the subject (p=0.49), making frequent eye contact (p=0.49) and making eye contact with all parts of the room, not just one side (p=0.49), refraining from making inappropriate gestures such as scratching or wiping nose (p=0.49), using a high voice so everyone in the room can hear it (p=0.11), articulating clearly (p=1.00), following a logical sequence (p=0.23), and refraining from turning back to audience while presenting slides (p=1.00) (Table 2).

According to students' evaluation pre-program, less than half of the instructors stated the objectives clearly (45%), asked the audience for questions to generate a discussion (45%), used slides with a few key words (40%), and provided handouts (30%). However, post-program, instructors' performance has improved significantly in most of the evaluation's aspects.

Only a few aspects didn't show significant improvement, including ensuring the training environment is provided with computer/data-show (p=1.00), appropriate seating (p=1.00), lighting (p=1.00), ventilation (p=0.49), and no noise (p=1.00), being dressed formally to seem authoritative and persuasive (p=1.00), introduced him/herself (p=0.74).

But being comfortable with the subject (p=0.49), making frequent eye contact (p=1.00) and making eye contact with all parts of the room, not just one side (p=0.49), delivering presentation with energy and enthusiasm (p=031), moving appropriately (p=1.00), using hand movements (p=1.00), refraining from making inappropriate gestures such as scratching or wiping nose (p=1.00), using a high voice so everyone in the room can hear it (p=0.49), articulating clearly (p=0.49), following a logical sequence (p=0.49), using fonts that are large enough to be read in all parts of the room (p=0.34), easy to read (e.g. Arial) (p=0.08). While letters in caps and lowercase instead of all caps (p=0.49), using slides without too many colors (p=0.11), refraining from turning back to audience

while presenting slides (p=0.11), complying with the allocated length of time (p=0.09), ensuring the length of presentation matches audience attention span (p=0.31) (Table 3).

According to experts' evaluation, instructors' performance in clinical training improved significantly in terms of assessment, instructions, feedback, and attitude. Only a few aspects of evaluation didn't show such improvement. These include using factual questions (p=0.23), assessing students' attitude (p=1.00, 0.49 and 1.00, respectively), and treating students with respect (p=0.23) (Table 4).

Likewise, according to students' evaluation, instructors' performance in clinical training improved significantly in terms of assessment, instructions, feedback, and attitude. Yet, only a few aspects of evaluation didn't show such improvement. These include using factual and broadening questions (p=1.00 and 0.11,

Table 1: Demographic and academic characteristics of the instructors (N=20).

Variable	N (%)
Age (yrs)	
Range	28 - 45
Mean ± SD	34.0 ± 5.0
<30	4 (20)
>30	16 (80)
Gender	
Male	5 (25)
Female	15 (75)
Job position	
Demonstrator	2 (10)
Assistant Lecturer	15 (75)
Lecturer	3 (15)
Years passed since obtaining the degree	
Bachelor's degree	11.3 ± 4.8
Master's degree	11.3 ± 4.8
PhD	1.8 ± 1.5
Teaching experience (Years)	
Mean ± SD	5.9 ± 4.3
<10	14 (70)
>10	6 (30)
Training experience (Years)	
Mean ± SD	5.9 ± 4.3
<10	14 (70)
>10	6 (30)
Attended training courses	
Presentation skills	14 (70)
Teaching methods	13 (65)
Clinical Training	9 (45)
Adult learning	11 (55)
Given sessions	
Oral presentations	7.0 ± 4.5
number of attendants	21.5 ± 32
Clinical training sessions	18.5 ± 19.5
number of attendants	17.0 ± 26.8

Table 2: Comparison of instructors' performance in oral presentation before and after the program as evaluated by experts (N=20).

Presenter	Pre N (%)	Post N (%0)	X² test	p-value
1. Prepared environment for presentation:				
1.1. Computer/data-show	19 (95)	20 (100)	Fisher	1
1.2. Board/Flipchart (as needed)	13 (65)	20 (100)	Fisher	0.008*
1.3. Seating	19 (95)	20 (100)	Fisher	1
1.4. Lighting	20 (100)	20 (100)	0	1
1.5. Ventilation	20 (100)	20 (100)	0	1
1.6. Noise	18 (90)	20 (100)	Fisher	0.49
2. Is dressed formally to seem authoritative and persuasive	19 (95)	20 (100)	Fisher	1
3. Introduced self	15 (75)	20 (100)	Fisher	0.047*
4. Presentation appears well-rehearsed: Presenter:				
4.1. Knows content well (does not read presentation, is not dependent on notes)	10 (50)	20 (100)	13.33	<0.001*
4.2. Is comfortable with the subject	18 (90)	20 (100)	Fisher	0.49
4.3. Gives a preliminary overview	9 (45)	20 (100)	15.17	<0.001*
4.4. States clearly the objectives	7 (35)	20 (100)	19.26	<0.001*
5. Uses body language appropriately:				
5.1. Makes frequent eye contact	18 (90)	20 (100)	Fisher	0.49
5.2. Makes eye contact with all parts of the room, not just one side	18 (90)	20 (100)	Fisher	0.49
5.3. Delivers presentation with energy and enthusiasm (not boring)	11 (55)	20 (100)	Fisher	0.001*
5.4. Moves about the front of the room while speaking	5 (25)	20 (100)	24	<0.001*
5.5. Moves about appropriately (not excessively to avoid distraction)	7 (35)	20 (100)	19.26	<0.001*
5.6. Uses hands movements (not excessively to avoid distraction)	15 (75)	20 (100)	Fisher	0.047*
5.7. Refrains from making inappropriate gestures such as scratching or wiping nose	18 (90)	20 (100)	Fisher	0.49
6. Voice is high enough so everyone in the room can hear it	16 (80)	20 (100)	Fisher	0.11
7. Speaks at a normal pace (not too quickly or too slowly)	13 (65)	20 (100)	Fisher	0.008*
8. Varies voice pitch and does not speak in a monotone	10 (50)	20 (100)	13.33	<0.001*
9. Articulates clearly	20 (100)	20 (100)	0	1
10. Asks audience for questions to generate discussion	9 (45)	20 (100)	15.17	<0.001*
11. Follows logical sequence	17 (85)	20 (100)	Fisher	0.23
12. Provides illustrative examples to relate theory to practice	10 (50)	20 (100)	13.33	<0.001*
13. Uses data-show appropriately:				
13.1. Fonts used:				
13.1.1. Large enough to be read in all parts of the room	12 (60)	20 (100)	Fisher	0.003*
13.1.2. Easy to read (e.g. Arial)	10 (50)	20 (100)	13.33	<0.001*
13.1.3. Letters in caps and lowercase instead of all caps	14 (70)	20 (100)	Fisher	0.02*
13.1.4. No use of excessive numbers of fonts	8 (40)	20 (100)	17.14	<0.001*
13.2. Slides:				
13.2.1. Have just a few key words or phrases (not text-heavy)	7 (35)	20 (100)	19.26	<0.001*
13.2.2. Are simple in design.	9 (45)	20 (100)	15.17	<0.001*
13.2.3. Not too many colors	12 (60)	20 (100)	Fisher	0.003*
13.2.4. No hard-to-follow graphics	7 (35)	20 (100)	19.26	<0.001*
14. Refrains from turning back to audience while presenting slides	19 (95)	20 (100)	Fisher	1
15. Provides handouts as appropriate	6 (30)	20 (100)	21.54	<0.001*
16. Complied with the allocated length of time	14 (70)	20 (100)	Fisher	0.02*
17. Length of presentation matches audience attention span	15 (75)	20 (100)	Fisher	0.047*

* Statistically significant P value <0.05.

Table 3: Comparison of instructors' performance in oral presentation before and after the program as evaluated by their students (N=20).

Presenter		Pre N (%)	Pre N (%0)	X² test	p-value
1.1.	Computer/data-show	19 (95)	20 (100)	Fisher	1
1.2.	Board/Flipchart (as needed)	10 (50)	20 (100)	13.33	<0.001*
1.3.	Seating	20 (100)	20 (100)	0	1
1.4.	Lighting	20 (100)	20 (100)	0	1
1.5.	Ventilation	18 (90)	20 (100)	Fisher	0.49
1.6.	Noise	19 (95)	20 (100)	Fisher	1
2.	**Is dressed formally to seem authoritative and persuasive**	20 (100)	19 (95)	Fisher	1
3.	**Introduced self**	13 (65)	14 (70)	0.11	0.74
4.	**Presentation appears well-rehearsed: Presenter:**				
4.1.	Knows content well (does not read presentation, is not dependent on notes)	15 (75)	20 (100)	Fisher	0.047*
4.2.	Is comfortable with the subject	18 (90)	20 (100)	Fisher	0.49
4.3.	Gives a preliminary overview	10 (50)	20 (100)	13.33	<0.001*
4.4.	States clearly the objectives	9 (45)	20 (100)	15.17	<0.001*
5.	**Uses body language appropriately:**				
5.1.	Makes frequent eye contact	19 (95)	20 (100)	Fisher	1
5.2.	Makes eye contact with all parts of the room, not just one side	18 (90)	20 (100)	Fisher	0.49
5.3.	Delivers presentation with energy and enthusiasm (not boring)	12 (60)	15 (75)	1.03	0.31
5.4.	Moves about the front of the room while speaking	11 (55)	19 (95)	8.53	0.003*
5.5.	Moves about appropriately (not excessively to avoid distraction)	19 (95)	20 (100)	Fisher	1
5.6.	Uses hands movements (not excessively to avoid distraction)	20 (100)	20 (100)	0	1
5.7.	Refrains from making inappropriate gestures such as scratching or wiping nose	18 (90)	19 (95)	Fisher	1
6.	**Voice is high enough so everyone in the room can hear it**	18 (90)	20 (100)	Fisher	0.49
7.	**Speaks at a normal pace (not too quickly or too slowly)**	14 (70)	20 (100)	Fisher	0.02*
8.	**Varies voice pitch and does not speak in a monotone**	11 (55)	20 (100)	Fisher	0.001*
9.	**Articulates clearly**	18 (90)	20 (100)	Fisher	0.49
10.	**Asks audience for questions to generate discussion**	9 (45)	20 (100)	15.17	<0.001*
11.	**Follows logical sequence**	18 (90)	20 (100)	Fisher	0.49
12.	**Provides illustrative examples to relate theory to practice**	10 (50)	20 (100)	13.33	<0.001*
13.	**Uses data-show appropriately:**				
13.1. Fonts used:					
13.1.1.	Large enough to be read in all parts of the room	16 (80)	19 (95)	Fisher	0.34
13.1.2.	Easy to read (e.g. Arial)	12 (60)	17 (85)	3.13	0.08
13.1.3.	Letters in caps and lowercase instead of all caps	18 (90)	20 (100)	Fisher	0.49
13.1.4.	No use of excessive numbers of fonts	16 (80)	20 (100)	Fisher	0.11
13.2. Slides:					
13.2.1.	Have just a few key words or phrases (not text-heavy)	8 (40)	17 (85)	8.64	0.003*
13.2.2.	Are simple in design.	11 (55)	20 (100)	Fisher	0.001*
13.2.3.	Not too many colors	16 (80)	20 (100)	Fisher	0.11
13.2.4.	No hard-to-follow graphics	13 (65)	20 (100)	Fisher	0.008*
14.	**Refrains from turning back to audience while presenting slides**	16 (80)	20 (100)	Fisher	0.11
15.	**Provides handouts as appropriate**	6 (30)	19 (95)	18.03	<0.001*
16.	**Complied with the allocated length of time**	14 (70)	19 (95)	Fisher	0.09
17.	**Length of presentation matches audience attention span**	12 (60)	15 (75)	1.03	0.31

* Statistically significant P value <0.05.

Table 4. Comparison of instructors' performance in clinical training before and after the program as evaluated by an expert (N=20).

Presenter	N (%)	N (%0)	X² test	p-value
1. ASSESSMENT				
a. Assessment of student knowledge: Trainer assessed student knowledge through:				
i. Use of factual questions (e.g. what normal fasting blood glucose level is)	17 (85)	20 (100)	Fisher	0.23
ii. Use of broadening questions (e.g. what makes you say that)	11 (55)	20 (100)	Fisher	0.001*
iii. Use of justifying questions (e.g. what you would do in this case, and why)	5 (25)	20 (100)	24	<0.001*
iv. Use of hypothetical questions (e.g. what if....)	5 (25)	20 (100)	24	<0.001*
v. Use of alternative questions (e.g. what if you did this rather than that)	4 (20)	20 (100)	26.67	<0.001*
b. Assessment of student skills: The trainer ..				
i. Gives student adequate instruction for the skill to be performed	5 (25)	20 (100)	24	<0.001*
ii. Adequately observe the student perform skills	12 (60)	20 (100)	Fisher	0.003*
iii. Assigns procedures appropriate for student skill level	8 (40)	20 (100)	17.14	<0.001*
c. Assessment of student attitudes: Trainer shows evidence of assessing student attitudes (communication skills) including:				
i. Rapport with patients	19 (75)	20 (100)	Fisher	1
ii. Empathy	18 (90)	20 (100)	Fisher	0.49
iii. Non-judgmental attitude toward patients	19 (95)	20 (100)	Fisher	1
2. INSTRUCTION				
a. Sharing experience: The trainer..				
i. Takes an active role in sharing experience	8 (40)	20 (100)	17.14	<0.001*
ii. Allows the student to share experiences	8 (40)	20 (100)	17.14	<0.001*
iii. Enhances student to assign appropriate objectives for reading	14 (70)	20 (100)	Fisher	0.02*
b. Role Modeling: The trainer..				
i. Shows model professional demeanor	7 (35)	20 (100)	19.26	<0.001*
ii. Shows model clinical competency	11 (55)	20 (100)	Fisher	0.001*
iii. Exhibits sensitivity to students	12 (60)	20 (100)	Fisher	0.003*
iv. Exhibits sensitivity to patients	13 (65)	20 (100)	Fisher	0.008*
v. Demonstrates enthusiasm for medicine	9 (45)	20 (100)	15.17	<0.001*
vi. Demonstrates enthusiasm for teaching	9 (45)	20 (100)	15.17	<0.001*
vii. Treats students with respect	17 (85)	20 (100)	Fisher	0.23
3. FEEDBACK: The trainer ..				
a. Provides feedback in appropriate time manner	6 (30)	20 (100)	21.54	<0.001*
b. Provides specific feedback	6 (30)	20 (100)	21.54	<0.001*
c. Focuses on behavior rather than personality traits	6 (30)	20 (100)	21.54	<0.001*
d. Distinguishes between the performance and the personal	7 (35)	20 (100)	19.26	<0.001*
e. Identifies areas for improvement	11 (55)	20 (100)	Fisher	0.001*
f. Offers alternatives	6 (30)	20 (100)	21.54	<0.001*
g. Checks for understanding	8 (40)	20 (100)	17.14	<0.001*
4. ATTITUDE: The trainer ..				
a. Develops rapport with students	9 (45)	20 (100)	15.17	<0.001*
b. Shows genuine interest in students	11 (55)	20 (100)	Fisher	0.001*
c. Makes him/herself accessible to students	9 (45)	20 (100)	15.17	<0.001*
d. Shows empathy to students	13 (65)	20 (100)	Fisher	0.008*
e. Behaves in a non-judgmental way	10 (50)	20 (100)	13.33	<0.001*

*Statistically significant P value <0.05.

respectively), assessing students' attitude (p=1.00, 1.00 and 1.00, respectively), enhancing student to assign appropriate objectives for reading (p=1.00), exhibiting sensitivity to patients (p=0.23), and treating students with respect (p=1.00) (Table 5).

Experts' total evaluation of instructors' performance in oral presentations session was significantly lower than that of the students before the interventional program by 2.8 ± 10.0; however, following the program, experts' evaluation became superior to students' evaluation 4.3 ± 4.1 (p=0.03). Meanwhile, experts' and students' evaluations of instructors' performance in clinical training was not significantly different whether before or after the program (p=1.00) (Table 6).

According to experts' evaluation, instructors' performance in oral presentations was significantly associated with their age, experience in teaching and training, and attending courses in teaching methods and clinical training (p=0.04, 0.03, 0.03, 0.008, respectively). Additionally, according to students' evaluation, performance was also associated with gender, job position attending courses in presentation skills (p=0.04, 0.03, 0.02, respectively).

Meanwhile, according to experts' evaluation, instructors' performance in clinical training was only associated with their job position (p=0.01), whereas according to students' evaluation, it was also associated with attending courses in presentation skills, teaching methods, and clinical training (p=0.02, 0.002, 0.03, respectively) (Table 7).

According to expert's and students' evaluation, instructors' performance in oral presentations were negatively correlated with their age, their experience in teaching and training, and the number of oral presentations they have given. However, it was not correlated with the number of clinical training sessions they have given or the number of attendants. Meanwhile, according to students' evaluation, instructors' performance in clinical training was negatively correlated with their age and the number of oral presentations they have given only. Yet, according to expert's evaluation, performance in clinical training was not correlated with any of these items (Table 8).

Table 5: Comparison of instructors' performance in clinical training before and after the program as evaluated by their students (N=20).

Presenter	Pre N (%)	Post N (%0	X² test	P value
1. ASSESSMENT				
a. Assessment of student knowledge: Trainer assessed student knowledge through:				
i. Use of factual questions (e.g. what normal fasting blood glucose level is)	19 (95)	20 (100)	Fisher	1
ii. Use of broadening questions (e.g. what makes you say that)	16 (80)	20 (100)	Fisher	0.11
iii. Use of justifying questions (e.g. what you would do in this case, and why)	12 (60)	20 (100)	Fisher	0.003*
iv. Use of hypothetical questions (e.g. what if....)	7 (35)	20 (100)	19.26	<0.001*
v. Use of alternative questions (e.g. what if you did this rather than that)	5 (25)	20 (100)	24	<0.001*
b. Assessment of student skills: The trainer ..				
i. Gives student adequate instruction for the skill to be performed	7 (35)	20 (100)	19.26	<0.001*
ii. Adequately observe the student perform skills	12 (60)	20 (100)	Fisher	0.003*
iii. Assigns procedures appropriate for student skill level	7 (35)	20 (100)	19.26	<0.001*
c. Assessment of student attitudes: Trainer shows evidence of assessing student attitudes (communication skills) including:				
i. Rapport with patients	19 (94)	20 (100)	Fisher	1
ii. Empathy	19 (95)	20 (100)	Fisher	1
iii. Non-judgmental attitude toward patients	19 (95)	20 (100)	Fisher	1
2. INSTRUCTION				
a. Sharing experience: The trainer ..				
i. Takes an active role in sharing experience	7 (35)	20 (100)	19.26	<0.001*
ii. Allows the student to share experiences	5 (25)	20 (100)	24	<0.001*
iii. Enhances student to assign appropriate objectives for reading	19 (95)	20 (100)	Fisher	1
b. Role Modeling: The trainer ..	11(55)			
i. Shows model professional demeanor	15 (75)	20 (100)	Fisher	0.001*
ii. Shows model clinical competency	11 (55)	20 (100)	Fisher	0.047*
iii. Exhibits sensitivity to students	17 (85)	20 (100)	Fisher	0.001*
iv. Exhibits sensitivity to patients	14 (70)	20 (100)	Fisher	0.23
v. Demonstrates enthusiasm for medicine	8 (40)	20 (100)	Fisher	0.02*
vi. Demonstrates enthusiasm for teaching	20 (100)	20 (100)	17.14	<0.001*
vii. Treats students with respect	3 (15)	20 (100)	0	1
3. FEEDBACK: The trainer ..				
a. Provides feedback in appropriate time manner	4 (20)	20 (100)	29.57	<0.001*
b. Provides specific feedback	5 (25)	20 (100)	26.67	<0.001*
c. Focuses on behavior rather than personality traits	6 (30)	20 (100)	24	<0.001*

d.	Distinguishes between the performance and the personal	12 (60)	20 (100)	21.54	<0.001*
e.	Identifies areas for improvement	6 (30)	20 (100)	Fisher	0.003*
f.	Offers alternatives	5 (25)	20 (100)	21.54	<0.001*
g.	Checks for understanding	4 (20)	20 (100)	24	<0.001*
4.	ATTITUDE: The trainer ..				
a.	Develops rapport with students	9 (45)	20 (100)	26.67	<0.001*
b.	Shows genuine interest in students	5 (25)	20 (100)	15.17	<0.001*
c.	Makes him/herself accessible to students	12 (60)	20 (100)	24	<0.001*
d.	Shows empathy to students	5 (25)	20 (100)	Fisher	0.003*
e.	Behaves in a non-judgmental way	12 (60)	20 (100)	24	<0.001*

* Statistically significant P value <0.05.

Table 6: Comparison between expert's and students' total evaluation of instructors' performance in oral presentations and clinical training session before and after the interventional program (N=20).

Performance in	Expert-Students differences Mean ± SD		Mann-Whitney Test	p-value
	Pre	Post		
Oral Presentations	-2.8 ± 10.0	4.3 ± 4.1	4.76	0.03*
Clinical Training	-0.3 ± 31.9	0.0 ± 0.0	0	1

*Statistically significant at $P < 0.05$

Table 7: The association between instructors' characteristics and their knowledge, attitude, and self-confidence (N=20).

Variables	Pre-post score difference			
	Oral Presentation (Expert)	Oral Presentation (Students)	Clinical Training (Expert)	Clinical Training (Students)
Age (Years)				
<30	51.3 ± 3.4	38.1 ± 8.6	71.2 ± 16.5	66.7 ± 16.0
>30	28.8 ± 19.6	23.2 ± 14.6	44.1 ± 31.4	43.0 ± 28.7
p value	0.03*	0.04*	0.12	0.12
Gender				
Male	17.9 ± 17.0	14.2 ± 10.3	52.7 ± 26.6	40.6 ± 26.2
Female	38.4 ± 18.4	30.2 ± 14.0	48.5 ± 32.8	50.1 ± 29.1
p value	0.54	0.04*	0.79	0.38
Job position				
Assistant staff member	36.2 ± 18.5	29.3 ± 13.5	57.6 ± 25.7	56.1 ± 20.8
Faculty staff member	16.7 ± 22.4	8.6 ± 7.8	4.0 ± 7.0	0.0 ± 0.0
p value	0.08	0.03*	0.01*	0.007*
Teaching experience (Years)				
<10	40.2 ± 18.3	32.3 ± 13.0	50.9±31.2	53.7 ± 26.5
>10	17.1 ± 13.2	11.9 ± 5.5	46.5±32.2	33.8 ± 28.7
p value	0.03*	0.003*	0.87	0.13
Training experience (Years)				
<10	40.2 ± 18.3	32.3 ± 13.0	50.9 ± 31.2	53.7±26.5
>10	17.1 ± 13.2	11.9 ± 5.5	46.5 ± 32.2	33.8±28.7
p value	0.03*	0.003*	0.87	0.13
Attended training courses				
Presentation skills				
Yes	43.4 ± 17.2	39.1 ± 12.8	60.1 ± 33.0	68.7 ± 16.1
No	29.0 ± 19.8	20.7 ± 12.0	45.0 ± 29.8	38.7 ± 27.6
p value	0.13	0.02*	0.25	0.02*
Teaching methods				
Yes	45.9 ± 15.5	38.3 ± 11.4	68.0 ± 23.4	71.9±10.3
No	26.5 ± 18.9	19.7 ± 12.1	39.6 ± 30.3	34.7 ± 25.9

p value	0.03*	0.007*	0.06	0.002*
Clinical Training				
Yes	43.3 ± 15.6	34.3 ± 12.7	55.7 ± 28.5	58.4±24.6
No	21.1 ± 17.9	16.3 ± 10.7	42.1 ± 33.3	34.7±27.6
p value	0.008*	0.006*	0.38	0.03*
Adult learning				
Yes	40.9 ± 15.6	31.5 ± 12.4	49.2 ± 29.2	55.9 ± 24.6
No	27.0 ± 21.3	21.8 ± 15.6	49.9 ± 33.3	41.0 ± 30.0
p value	0.12	0.17	0.76	0.17

*Significant at *p* value <0.05

Table 8: Correlation between instructors' characteristics and their performance in oral presentations and clinical sessions according to expert's and students' evaluation (N=20).

Variable	Oral Pres. (Expert)	Oral Pres. (Students)	Clinical Training (Expert)	Clinical Training (Students)
Age	-0.652*	-0.719*	-0.37	-0.501*
Teaching experience	-0.501*	-0.561*	-0.157	-0.342
Training experience	-0.504*	-0.572*	-0.083	-0.191
Given sessions				
Oral presentations	-0.646*	-0.571*	-0.343	-0.494*
number of attendants	-0.012	-0.03	0.128	-0.307
Clinical training sessions	-0.208	-0.223	-0.4	-0.308
number of attendants	-0.375	-0.364	-0.042	-0.279
	Spearman's rank correlation coefficient Significant at p value <0.05			

DISCUSSION

The present study aim was to improve the educational outcome by developing a highly competent family medicine trainer. Our results indicated generally poor performance among the participating instructors prior to the Training of Trainer program. However, implementing the Training of Trainer program has significantly boosted the instructors' in the performance of oral presentation. Concerning instructors' performance in clinical training prior to the program, only the steps of assessment of student attitudes towards patients such as rapport and empathy were achieved by the majority of the instructors. At the post-intervention phase, significant improvements were shown in all aspects of performance in clinical training/teaching, as evaluated by experts and students. A Turkish study reported a similar success of a training of trainers in improving medical teachers' performance, with more efforts in facilitating the active participation of students during teaching sessions and stating the objectives of the course at the beginning of each session [7].

According to expert's and students' evaluation, improvement in instructors' performance in oral presentations was negatively correlated with their age, their experience in teaching and training, and the number of oral presentations they have given. However, it was not correlated with the number of clinical training sessions they have given nor the number of attendants. Meanwhile, improvement of performance in clinical training was negatively correlated with their age and the number of oral presentations they have given only. We suggest that individuals of younger age and low experience in the academic field are expected to make a higher benefit of the training given their actual unmet needs. This probably explains our findings. Yet, according to expert's evaluation, performance in clinical training was not correlated with any of these items. In a Pakistani study, Cansever et al. [8] highlighted the importance

of structured Training of Trainer program in increasing faculty members' level of knowledge about training, particularly for those who work in the academic field without receiving formal training in teaching.

Interestingly, experts' evaluation of instructors' performance in oral presentations session before the Training of Trainer program was significantly lower than that of the students; however, following the program, experts' evaluation became superior to students' evaluation. Since experts have been in the field of supervision and evaluation for a long period of time, they mostly evaluate based their knowledge of the appropriate performance required. This probably explains the lower scores they have given to instructors prior to the program and the higher scores after the instructors started using the information and skills the learned from the Training of Trainer program. On the other hand, when it comes to students, their evaluation is probably based on the feasibility of the learning process. Meanwhile, experts' and students' evaluations of instructors' performance in clinical training was not significantly different whether before or after the program. This finding demonstrates the reliability of the observation checklists and adds to the internal validity of the study.

LIMITATIONS

The first is the drawbacks of the quasi-experimental design. Although this design is lower in the hierarchy of evidence compared with the randomized trials, we were force to adopt it for logistic reasons that did not allow the utilization of a randomized design. The second is the potential observation bias, although there were attempts to overcome it through dual observation of expert and students, as well as the use of participant observation approach. The third is the relatively short time allowed after the intervention to induce changes in performance.

CONCLUSION

Family medicine instructors had a poor performance in oral presentations and clinical training sessions prior to the Training of Trainer program; however, the implementation of the Training of Trainer program has effectively boosted their performance. The developed Training of Trainer program should be applied in the study settings as well as in similar settings for more confirmation of its effectiveness, and for further improvement in its content and process. In order to enhance their training/teaching competencies, the training courses provided to clinical instructors should have specialized training focused on effective teaching and adult learning. Moreover, the study should be replicated using a randomized design in order to provide a higher level of evidence.

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