Telepraxis: An Innovative Educational Method

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ABSTRACT

Background: *"Telephone" has been used as an educational device for educational purposes in several university centers in the world. Nowadays, "Teleconference", "Teleconsultation", "Telemedicine" and "Computerized methods", are common educational methods.*
Telephone in this study was used as an educational means to practice certain educational and professional subjects.
Purpose: *In this study, telephone was used to practice important educational points by medical students. The method was called "Telepraxis" and the present paper introduces this innovative educational experience and reports the results of measuring the rate of students' satisfaction.*
Method: *In this study 4 different educational courses were presented to 508 students at pre-hospital, clerkship, and residency stages. The program was implemented for 15 sessions and at the end of each session, we inquired students' viewpoints about our suggested method by using a Lickert's type questionnaire that was designed with 24 characteristics of an effective educational method. We calculated the students' satisfaction index and compared the scores applying student T-Test.*
Results: *The participants' mean satisfaction index was 84.4%, which was significantly higher than those of unsatisfied, ($p<.001$). The satisfaction index for the students in clerkship stage was higher than that of the pre-hospital students or residents.*
Conclusion: *Telepraxis in 4 courses of primary surgery, health cares, semiology, and CPR skills, was approved by the learners on all the 24 traits of an effective teaching method.*
Key words: *MEDICAL EDUCATION, TELEPHONE, TELEMEDICINE, EFFECTIVE LEARNING*
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Introduction

Telephone, though invented 120 years ago, has still more to unfold as educational media. In 1955, in certain areas of the eastern states in Albany, telephone was used in continuing medical education. In 1963, the school of medicine in Ohio State University began to use the phone for instructional purposes in seven states and certain parts of Canada. In the United States, one of the most extensive Telephone networks organized in 1965 is the well-established Educational Telephone Network (NET) in the University of Wisconsin. While teleconference is nowadays established as a method of delivering continuing education courses(1), Telecommunication has been used in health care, Telemedicine is broadly defined as the use of telecommunication technology to provide medical information and services. This may include such areas as Tele-gnosis and Telepsychiatry, remote consultation diagnosis, specially clinical care in dermatology, cardiology, neurology, psychiatry, radiology, rheumatology outpatients, critical care, oncology, chronic condition, anaesthesiology, even patient education and home monitoring. Thus telephone reaches a broad spectrum of health care ranging from delivering routine and emergency care to obtaining the results of lab investigations, frequent drug orders and facilitating health professional interventions, which range from simple transfer of information or education to such complex management decisions as triage, informing the patient about diagnostic tests results, management of UTI in women, depression monitoring and follow-up, diabetes management, counselling for smoking cessation, follow-ups of transurethral prostatectomy, and such acute conditions as RTIs, surgery post-ups and routine review of patients with asthma by telephone(4,5).
Several studies have clearly shown how eager patients are to consult their doctors by telephone and how highly satisfied they are with this mode of communication (3,4,5). In fact, at an audit

concurrently undertaken the level of satisfaction with this service (90% satisfied or very much satisfied) was comparable with that of clinic attendance (94%).

In this study, telephone was used as an educational device to practice of the important professional points by the students divided in small-groups. The method was called "Telepraxis" and the main goal of the present paper is to report this innovative educational experience. A questionnaire consisting of 24 items describing characteristics of an effective educational method was used to evaluate the program.

Introducing the Telepraxis:

Telepraxis is an innovative educational method aiming at the following objectives:

*Exposing the students to Necessary practical subjects

*Reviewing the known and acquiring new knowledge

*Flourishing listening skills, analytic clinical reasoning, problem solving, and decision- making abilities.

*Instilling communication skills

*Practicing appropriate medical consultation

*Expediting socialization processes

*Strengthening team work skills

In order to achieve the above objectives through we need the following materials and facilities:

*A number of written scenarios to practice the teaching points

*A small room for small group interactions

*A telephone set with in-built microphone and speaker

*An artificial patient trained to speak on the phone

*A larger room for large group discussions

Procedure:

in this method, at the first step, The teaching points are presented to the students by their Teacher. Then they are divided into groups of 5-7. Each group would go into the (Telephone)room where the teacher is present there. (The facilitator is ready in another room). Each student would be invited by their teacher to respond to the call which is pre-arranged by the teacher and the facilitator according to the assigned scenario. The facilitator presents a case and some sequential questions in relation to the case and oriented with the student's reply via the telephone. The students would deal with each question in their small group. In this stage the teacher is only an observer. the results of different team activities are reported to the large group by the teacher for further discussions.

Telepraxis combines such educational techniques as oral simulation, oral P.M.P, guided practice, role play, role-model, and tutoring. Several scenarios, based on the application of the main ideas in the lesson presented by the teacher are presented for small group activity to practice the points to gain clinical mastery and at the same time to develop the right attitude and the necessary communication skills and decision making abilities to manage the artificial patients. The artificial patient is the same pre-educated facilitator about the scenarios and might be as a patient, a patient's mother, a nurse, an intern, a stager, etc.

The small groups would take turns to enter the room where the teacher is standing next to the phone to invite one of the members of the group to walk to the phone, to listen carefully to the person at the other end and to consult other members of the group before s/he could answer back the one on the phone. The phone is set on the speaker so every body can hear the person inquiring.

An example for a "Telepraxis" process:

Scenario I, time: 3 mins. (here, the facilitator is as a nurse)

Facilitator: Hello is that the skills lab?

Facilitator: Good morning, I'm a nurse at the department of surgery. I had a few questions, if you don't mind!

Question 1: We have a patient who has undergone a choledochojejunostomy operation 4 hours ago. The patient is rather calm but has only 50 ml urine collected in his urine bag. What would you recommend?

Having heard the case, the students consult each other and discuss probable reasons for oliguria and the student at the phone set will answer the nurse. Meanwhile, the Teacher is a mere observer who makes notes of social, communicative, academic, teacher, ethical, and informative points without any interference.

Question 2: What should I do if the patient became restless of the pain?

Once again the students discussed the case taking into account such factors as age, sex, weight, etc. to come up with the final answer.

Scenario II Time: 5 mins. (here, the facilitator is as a mother and inquiring about her little son):

My 7-years-old son fell down in the yard this morning and hurt his knee. I took him to the

emergency department. He received several stitches on his knee. At the present he has a swollen knee with severe pain. What can I do about him?

The person on the phone, who is a facilitator, may ask several questions on the necessity of doing a radiography, administering an analgesic, or antibiotics, Tetanus serum or vaccine, dressing the wound, appropriate time to have a washing, the time to remove sutures or any other authentic and practical questions.

For different scenarios, the teacher could invite different groups of students to come in and answer the phone so that student's full participation would be insured.

The suitable time for each group in our experience turned to be 10-15 minutes.

Finally, the teacher would discuss the details in the large group where all students may participate in the discussion and he/she can give them the feedback or their conscious or automatic reactions and behavior according to the notes he/she has made.

We have assessed "Telepraxis" , and the method and results of our evaluation are summarized in the following paragraphs::

Material and Methods

Telepraxis was implemented with 508 medical students at different stages of their curriculum. It was used in 15 teaching sessions, four different courses, primary surgery, health cares, semi logy, and CPR skills. We have written different scenarios for different courses. The literature survey in teaching and learning in medical education has shown that any effective teaching in medicine should meet certain criteria. Based on such research a 24-item questionnaire was designed and at the end of every course was given to the participants to rate the effectiveness of the program on a Likert's scale. In statistic analysis, different groups of learners and their viewpoints on different courses were compared and applying a t-test the results were judged. The participant's satisfaction index (SI) was calculated by applying the following formula:

$$SI = \frac{100 + 100/n}{2}$$

where n is the number of divisions on the Likert's scale. The number of divisions in the main questionnaire was "5", but with the combination of the two ended scales, n was 3 for this questionnaire, therefore the minimum amount for SI would be 66.7.

Results

Table 1 shows the frequency of teaching sessions for 508 medical students at 3 different levels of pre-hospital students, clerkship, and residency in the four courses of health cares, semiology, CPR, and primary surgery skills.

TABLE 1. Frequency of teaching sessions for the 4 courses

Courses	No. of session	No. of participants	%
Health care skills	3	69	13.6
Semiology skills	1	53	10.4
CPR skills	3	85	16.7
Surgical skills	8	301	59.3
Total	15	508	100

Table 2 shows the number of participants at each of the 3 stages of curriculum.

TABLE 2. Relative and Absolute Frequency of participants at each stage.

Stages	No of participants	Percentage
Pre-hospital	53	10.4
Clerkship	370	72.8
Residency	85	16.7
Total	508	100

The participant's views on the 24 attributes of an efficient educational method were collected on a 3 degree Likert's scale as "agreed" (consist of completely agreed, and agreed), disagreed (consist of completely disagreed and disagreed), and "neutral."

Table 3 shows the views of each class of the participants on each educational attribute of telepraxis. The total score for the participants on each choice of the questionnaire was analysed and

applying the Student's t-test, we showed that those with a positive attitude outweighed the ones with a negative attitude (p<0.001). The intergroup comparisons proved that participants in the surgery course developed a significantly more sympathetic attitude towards teleprafxis (p= 0.014). Other groups had an equally positive attitude towards telepraxis.

TABLE 3. Participants' viewpoints on individual educational attributes of telepraxis

Items	agree	neutral	Disagree
I experienced a new educational approach.	443(92.9%)	26(5.5%)	8(1.7%)
I found it quite exciting.	429(86.7%)	47(9.5%)	19(3.8%)
I found it a suitable "learning" method	423(88.3%)	33(6.9%)	23(4.8%)
It is most appropriate for applied professional subjects.	440(92.6%)	23(4.8%)	12(2.5%)
It is a community oriented approach.	333(71.9%)	102(22%)	28(6.1%)
The method flourishes motivation and makes me feel curious.	425(90.2%)	30(6.4%)	16(3.4%)
It calls for students participation.	425(89.3%)	45(9.5%)	6(1.3%)
It facilitates learning.	407(83.1%)	61(12.4%)	22(4.5%)
It brings about permanent learning.	378(78.4%)	67(13.9%)	37(7.6%)
It presented me with immediate feedback.	294(62.4%)	123(26.1%)	54(11.4%)
It is distressing.	157(33.9%)	106(22.9%)	200(43.2%)
It makes the learner reflect upon one's professional duties.	445(90.4%)	31(6.3%)	16(3.2%)
It makes the learner do things.	440(91.9%)	29(6.1%)	10(2.1%)
It acquaints the learner with the subject applications.	450(92.6%)	29(6%)	7(1.4%)
It helps the learner gain a more objective self-evaluation.	452(93.8%)	20(4.11%)	10(2.4%)
It acquaints the learner with realistic community needs.	394(81.2%)	71(14.6%)	20(4.1%)
It instils appropriate communication skills in the learner.	422(85.8%)	49(10%)	21(4.3%)
It helps listening skills.	399(84.9%)	47(10%)	24(5.1%)
It helps decision making skills.	411(84.7%)	48(9.9%)	26(5.4%)
It establishes reasoning skills in the learner.	392(82.9%)	62(13.1%)	20(4%)
It helps the learner to come up with simple explanations.	399(81.4%)	71(14.5%)	20(4.1%)
it enhances the learner's self-confidence.	383(79%)	75(15.5%)	27(5.6%)
It helps the learner avoid dogmas and doubt everything.	309(67.9%)	89(19.6%)	57(12.5%)
Overall, it is a fulfilling educational skills lab.	430(92.7%)	15(13.2%)	19(4.1%)

Among the participants at the 3 different stages of the medicine curriculum, the participants in clerkship courses were significantly more sympathetic towards telepraxis than those in the other two levels of pre-hospital and residency (p=0.02) although the dominant attitude at all levels was positive (p<0.001). Generally, all participants admitted that telepraxis had a positive effect on such other individual factors as motivations, interest, emotions, skill strengthening, reforming, community orientation, providing feedback, and providing a suitable atmosphere.(p<0.001). They also believed that telepraxis strengthens communication skills, listening skills, clinical reasoning and decision making abilities in the participants (p<0.001). To sum up, the participants, generally, rated telepraxis a satisfactory educational method with a satisfaction index of 84.4% which is 17.7% higher than that of the basis, that is determined 66.7%

Discussion

In this study, telephone is used as an educational medium to apply a new combination of oral simulation, role-play, etc for efficient medical education. The new method was practiced with 508 students from 3 stages on medical curriculum to implement the four courses of primary surgery, health cares, CPR and semiology skills. The students' viewpoints were collected by a 24-item questionnaire assessing the program for the criteria of efficient educational methods which would consist of some such components as follows:

1. **The emotional component**. Learning process is both emotional and intellectual (6). Furthermore, it must have some charismatic influence (7). This

component may affect learning process positively or negatively. In this study 200 students (43.2%) found this method emotionally positive while 157 (33.9%) believed it caused a negative effect.

2. **Motivation.** This is a key component to any learning (6). In this study 425 students(90.2%) claimed that they found telepraxis motivating and that they were very curious about it.

3. **Insuring learner's participation**. 425 students (89.3%) agreed that telepraxis attracts learner's participation and insures a considerable level of collaboration among them.

4. **Application.** Learning results from practice and experience (6). In medicine, building up personal knowledge, discussing cases and managing patients are integrable components of the learning process (7). Active learning is known to increase retention and enable the learner to transfer what he has learned to new situations (9). 440 students (92.6%) admitted that telepraxis exposed them to new experience while 92.1% believed that this method acquainted them with practical subjects.

5. **Change** Learning is a process of bringing about a relatively permanent change in one's attitude. And, 83.1% of the participants in this study evaluated telepraxis to be successful in bringing about permanent learning (6).

6. **Appropriate atmosphere**. An appropriate learning atmosphere takes care of individual differences, recognizes learner's right to make mistakes, tolerates imperfections, encourages openness, enhances self-esteem, and allows for confrontation of ideas(6).

7. In this study, 67.9% of the participants agreed that telepraxis promotes a feeling of doubt and uncertainty, 79% believed that it enhances self-esteem, and 93.8% assigned all these characteristics to this learning method.

8. **Feedback** Providing the learner with appropriate feedback is highly important (6). Presentation, supervision, summarizing, and giving the learner suitable feedback are integral parts of any successful learning (7). Giving feedback is a key factor concerning the learner's self-esteem (10). A balanced combination of positive and negative feedback is most effective in most instances (9). In this study, 62.4% of the participants believed that telepraxis provided for them an immediate feedback.

9. **Community orientation**. Educational objectives are expected to be related to the health needs of the society (6). In this study, 71.9% of the subjects considered telepraxis to be community oriented. And, 90.4% agreed that this method persuades the learners to think of their professional tasks.

10. **Other criteria.** An efficient educational method is expected to reinforce such skills and abilities as communication (interpersonal) skills, listening, thinking, analysis, interpreting, clinical reasoning, decision making, and problem solving(4-6). Telepraxis is considered by 85.8% of the students to reinforce appropriate communication skills in learners. 84.9% of the participants stated that telepraxis improved listening skills. 84.7% agreed that it flourished clinical reasoning skills and 82.9% said it reinforced clinical decision making. Finally, one should mention the importance of telephone communication for medical doctors.

Training in telephone consultation skills focuses on:

*Active listining and detailed history taking.

*Ensuring better communication through,

1. Clarifying and paraphrasing
2. Picking up sound cues (pace,pauses, intonation,..)
3. Offering opportunities to ask questions

*Documentation (4).

Telepraxis, according to 8 1.4% of the participants in this study, reinforces both consultation and communication skills. On the whole 92.7% of the students were satisfied with this method and classified it as an efficient educational method. On all the 24 items in the questionnaire the average rating was 20% higher than that of the basis.

Conclusion

Telepraxis, mostly welcomed by the stagers, is rated an efficient approach to applied and professional topics in medical education throughout the curriculum.

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