CAN DISTANCE COMMUNICATION SKILLS TRAINING INCREASE THE EMPATHY LEVELS IN MEDICAL STUDENTS? AN APPLICATION DURING THE PANDEMIC PERIOD

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ABSTRACT

Purpose: The aim is to determine the effect of the communication skills training (CST) using interactive synchronous and asynchronous methods, which was applied for the first time on medical students' empathy levels.
Methods: This study is a cross-sectional-analytical, self-controlled intervention. The distance CST program was applied to first-year medical students. The change in students' empathy levels was measured with the student version of the Jefferson Empathy Scale.
Results: 241 students' forms were included. Empathy mean score increased significantly. It was observed that in general, the empathy levels of women were higher than men.
Conclusion: The distance CST produced a positive effect on empathy levels. While interactive PowerPoint® presentations, videos, movie clips, cartoons, real-life examples, written/audio question-answer activities, surveys, feedback and, small group work were used in live lessons; in the asynchronous process, student-based techniques (self-assessment, homework, WhatsApp® sharing) were used to support the online learning climate. We believe that all of them support the cognitive and social existence of students throughout the training. We propose our program as a model that can beused during situations where face-to-face education is not possible and to support face-to-face education in medical education.
Keywords: Medical education, distance learning, distance education, communication skills training, empathy

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INTRODUCTION

Many institutions and guides related to medical education emphasize the importance of communication skills (CS) in medicine and thus in medical education. For this reason, many medical faculties include educational activities aimed at developing various components of communication skills in their undergraduate education programs (1-4). In communication skills training programs, traditional training methods and especially presentations based on theoretical knowledge transfer are not enough. Because communication skills learning objectives mainly consist of affective and psychomotor domain objectives. It is mostly recommended to create life-based learning experiences with applications organized according to learning objectives. Teaching techniques generally used for this purpose are observing and discussing examples from real-life medical practices, reflection applications, watching and discussing audio-visual materials such as a whole or sectional films-series, use of role-plays, interviews with simulated patients, discussions over student interview records. These techniques are mostly conducted in small groups. Whatever technique we use, it is important and necessary to effectively use the feedback of individuals, peers, and trainers (5–9).

Dokuz Eylul University Faculty of Medicine (DEUFM) includes learning objectives for CS in undergraduate program, and graduates are expected to be able to communicate effectively while practicing their profession (10). Training practices for CS have been conducted since 1997–1998 academic year and covering all periods. The objectives in Term I are to develop sensitivity and ownership regarding the importance of CS in medicine and basic CS (Table 1). In the second and third years, physician-patient communication specific to the individual's developmental periods, communication with patient relatives, communication goals specific to different patient groups are included. It is aimed to discuss task-related communication issues during the clinical training period, where task-based learning is applied (11). During the COVID-19 pandemic, education in medical faculties was also affected. In this period, the virtual classroom, online synchronous and asynchronous education, hybrid education/blended education models came to the fore in medical education (12,13). In DEUFM, in the 2020–2021 academic year, undergraduate medical education was conducted through distance education for all

semesters, except for interns. For this reason, a training program that preserves the learning objectives existing in face-to-face education, can be implemented through distance education, and will implement synchronous and asynchronous education activities has been planned to conduct Term I basic CS training.

Table 1. Learning objectives of term I basic CS training

- Understanding the importance of CS in medical education
- Ability to express oneself in the group, self-evaluation in terms of CS
- Understanding the importance of active listening and nonverbal communication elements for the individual and the physician.
- Understanding the importance of the elements of effective verbal communication for the individual and the physician.
- Understanding the importance of the elements of clear communication for the individual and the physician.
- Understanding the importance of the elements of empathy for the individual and the physician.
- Understanding the importance of giving and receiving effective feedback for the individual and the physician.

The new program was implemented through the Sakai learning management system. In the program, 2x45 minutes were allocated for each learning objective, and they worked with small groups of 14-15 people, and 12 instructors took part in the training. In the synchronous sessions, targeted short video/film sections were used, instant questionnaires, question-answer activities, interactive PowerPoint® presentations were applied, and subgroup studies of 3–4 people were conducted. In the synchronous sessions, the students actively participated by constantly writing down their questions and opinions, using microphones frequently, and turning on their cameras. In the asynchronous process, assignments were given to be completed and uploaded to the system until the next lesson, and feedback was received through the system after each lesson. WhatsApp® groups have been created to provide communication with students. After the lessons, the lecture notes on the subjects were uploaded to the system. The self-assessment form, individual subject assignments and subgroup assignments that they were asked to complete between courses were used for in-process evaluation. For the end-of-term

evaluation, they were asked to record an interview they had with a friend or relative in video format. For the interview, students wrote a conversation scenario based on basic CS. Verbal and nonverbal communication, active listening and empathic approach items were used as evaluation criteria. The instructions for all these stages were shared with the students beforehand. To ensure standardization among the trainers, training materials were rehearsed by meeting with the trainers before each lesson.

In the literature, there are studies in which CS are conducted through distance education. Sun et al. developed software to be used in physician-patient communication training of interns and evaluated its effectiveness (14). Fleetwood et al. replaced two group discussions within the scope of bioethics and CS training with a computer-assisted learning program and investigated its effectiveness (15). Lai et al. developed a computer-assisted program to evaluate the CS of nursing students and so did Hulsman et al. to evaluate the CS of medical students (16,17). Sezer and Sezer designed a virtual patient application using technology to be used in the CS training of medical students (18). In these studies, students did not interact live with the instructors and/or their peers, but only interacted with computers, software, etc. In the literature, we have not encountered a distance education program designed and implemented in the format in our study with the aim of improving the CS of medical students. In our program, the use of synchronous and asynchronous techniques, as well as the interaction of trainers and students, occurred throughout the training.

Within the scope of the CS learning objectives in medical education, the targets for developing the empathic approach are indispensable (8,19). In physician-patient communication, empathy enables the physicians to better understand the thoughts and feelings of their patients and support cooperation with the patient in the diagnosis and treatment process. Among the learning objectives of the Faculty for Term 1 basic CS, there are also items related to empathy. Again, verbal/non-verbal communication, active listening, clear communication, receiving and giving feedback, which are among our goals, are also the requirements of empathic communication. Empathy is a skill that can be developed, learned, and measured. No study has been found in the medical education literature evaluating CS training using interactive synchronous and asynchronous methods and techniques. The study aims to determine the

effect of the basic CS training program applied in this way on the empathy levels of the students.

MATERIAL AND METHODS
This study is a cross-sectional-analytical, self-controlled interventional one. All 319 students who were Term I students and participated in the basic CS training program in the 2020–2021 academic year were included in the study.

Data Collection Tool
A questionnaire was used as a pretest/posttest to collect data from students. The student version (JES-S) of the Jefferson Empathy Scale is included in the questionnaire to determine the students' empathy scores and questions on sociodemographic variables. JES is the most widely accepted scale developed to measure the empathy levels of physicians and students, and it is also widely used in medical education research. JES-S was developed by Hojat et al., and the Turkish version was developed by Gönüllü and Öztuna (20,21). The 20-item scale is in 7-point Likert type. 10 of the items are scored in reverse. A minimum of 20 and a maximum of 140 points can be obtained. Higher scores indicate better empathic adjustment. The scale consists of three dimensions: "taking the perspective", "compassionate care", and "putting yourself in the patient's place".

Data Collection
The questionnaire was shared with the students through the Sakai, one week before start of the training and one week after end of the term assignments were taken after the training was completed, and they were asked to fill in it within five days. The data were collected anonymously, for this purpose, students were asked to co-code while answering the questionnaires (first two letters of birth month and last three digits of school number). Their informed consent was also obtained.). Their informed consent was also obtained.

Variables of the Study
The dependent variable of the study is the students' empathy levels. Gender, willingness to become a physician, the presence of a physician in the family or the person(s) with whom they feel close, the presence of serious/chronic illness in themselves or those with whom they feel close, whether they have received

training on empathy/communication until now have been determined as independent variables.

Statistical Analysis

Fisher's Exact Test and maximum likelihood ratio test were used in categorical data analysis. The internal consistency of the scale was evaluated with Cronbach's alpha reliability analysis method. Confirmatory factor analysis was performed to evaluate the validity of the scale in our study group. To compare group means/medians, Student's t-test was used to compare two independent groups when parametric test assumptions were met. Mann Whitney U test was used for the comparison of two independent groups for which the parametric test assumptions were not met, the Kruskal Wallis test for the comparison of more than two groups, and then the Bonferroni-Dunn test, one of the multiple comparison tests. The Two-Factor Repeated Measures Analysis of Variance Method, in which Greenhouse and Geisser correction was used, was used to compare the dependent groups. Data analysis was done on SPSS 25.0 statistical software. (IBM Corp. Released 2017. IBM SPSS Statistics for Windows, Version 25.0. Armonk, NY: IBM Corp.). A $p < 0.05$ level was accepted for statistical significance.

Ethical Approval

The study was approved by the DEUFM Non-Interventional Research Ethics Committee (Decision number: 2021/11-37, Date: 05.04.2021).

RESULTS

The study population is 319 people in total, an 293 people accepted to participate in the research and responded to the questionnaire. Those who answered the scale items incompletely and those who could not find the same code in the pre-test and post-test were not included in the analysis. As a result, the data of 241 people were analyzed. The survey response rate is 75.5%.

After factor analysis and reliability analysis for each factor, scale items were reduced to three factors. The explanation rate of total variance with three factors was obtained as 55,847. The total variance explanation rate was 21.160% for the 1st factor, 19.129% for the 2nd factor, and 15.558% for the 3rd factor. The Kaiser-Meyer-Olkin sample adequacy statistic was found to be 0.873. Bartlett's test of sphericity, which shows the existence of a sufficient relationship between the variables to apply factor

analysis, was obtained as $p < 0.001$. ANOVA-Tukey test was applied to obtain the total score of the scale and statistically significant results were obtained ($p < 0.001$). Cronbach's alpha values were 0.853 for the whole scale and 0.773, 0.723 and 0.668 for the dimensions, respectively. There are 13 items in the final version of the scale used in our study, so the minimum score that can be obtained is 13 and the maximum score is 91 (Table 2).

Table 2. Distribution of scale items to dimensions

Dimension	
1st Dimension	I believe that empathy is an important therapeutic factor in medical treatment.
	I believe that emotion has no place in the treatment of medical illness.
	Patients value a physician's understanding of their feelings which is therapeutic in its own right.
	Empathy is a therapeutic skill without which the physician's success is limited.
2nd Dimension	Physicians should try to understand what is going on in their patients' minds by paying attention to their nonverbal cues and body language.
	Physicians' understanding of the emotional status of their patients, as well as that of their families, is one important component of the physician–patient relationship.
	Physicians should try to think like their patients in order to render better care.
	Understanding body language is as important as verbal communication in physician-patient relationships.
	Patients feel better when their physicians understand their feelings.
3rd Dimension	Attentiveness to patients' personal experiences does not influence treatment outcomes.
	Attention to patients' emotions is not important in history taking.
	Asking patients about what is happening in their personal lives is not helpful in understanding their physical complaints.
	Patients' illnesses can be cured only by medical or surgical treatment; therefore, physicians' emotional ties with their patients do not have a significant influence in medical or surgical treatment.

116 (48.1%) of the students were male, and 125 (51.9%) were female. The mean age for all students was 19.4±0.7 (min:18, max:22). There was no statistically significant difference between the mean ages of female and male students.

The distribution of students according to some sociodemographic characteristics is given in Table 3.

The analysis results regarding the change in scale scores before and after the training are given in Table 4. After the education, the empathy scores of all students of both genders increased.

Table 3. Some sociodemographic characteristics of students

	Female	Male	p
Do you have a physician in your family or the person(s) you feel close to?	n(%)	n(%)	
Yes	41(55.4)	33(44.6)	0.487*
No	84(50,3)	83(49,7)	
Did you want to be a physician yourself?			
Yes	101(56.4)	78(43.6)	
Partially	23(41.1)	33(58.9)	0.026#
No	1(16.7)	5(83.3)	
Experiencing serious/chronic illness in her/himself or her/his relatives			
Yes	70(52.2)	64(47.8)	0.999*
No	55(51.4)	52(48.6)	
Have you ever received training in empathy/communication?			
Yes	4(57.1)	3(42.9)	0.999*
No	121(51.7)	113(48.3)	

*: Fisher's Exact Test, # : Likelihood Ratio

DISCUSSION

Our data revealed that the CS training, which we conducted through interactive live lessons, supported using a remote, structured asynchronous process during the pandemic period, had a positive effect on students' empathy levels. There are many studies that measure students' empathy levels. Although these studies were conducted face-to-face using different training and assessment methods, it is seen that the effect of education supports the increase in empathy levels (22–24).

When we evaluate the students in terms of their gender, the empathy attitudes of both women and men increased significantly after the training. It was observed that in general, the empathy levels of women were higher than men, both before and after education. This result corresponds with the findings commonly reported in the literature that the positive empathic approach is more in women (22,25–28).

There was a similar situation in terms of the independent variables in our study. For each variable, it was observed that empathy scores increased significantly after the training whether there was a physician in their close circles, whether they wanted to be a physician or were under the influence of someone else, whether one of their relatives had any chronic illness, or whether they had been trained in CS.

Although the format is different from the one we used in our study, it has been seen that some educational applications supported by technology and distance education and partially interacting with the trainers have positive contributions to the communication skills of the students. Fleetwood et al. stated that the computer-assisted learning program, which they normally integrate into face-to-face bioethics and CS training as two sessions, is a suitable option for medical students (15). Sezer and Sezer reported that a virtual patient application designed using technology to be used in the CS training was found as effective by medical students (18). Sun et al. reported that the software developed for use in physician-patient communication training of interns may have a positive contribution1 (14).

We think that each item we use in our program contributes positively to the development of students' empathy levels. In the asynchronous period of the program, our students filled out the self-assessment forms in which the basic communication elements were questioned, considering the concepts covered in the previous live lesson. In the process of filling out the form, they had the opportunity to think, question and understand at what level they used these items in their own social lives. Even though the social life of the students was restricted due to the pandemic, they mostly made examples based on home/family relations. The basic communication elements in the form were introduced to them in detail at the beginning, and at the beginning of each lesson, the trainers and students shared their self-assessment examples. Self-assessment attracts students' attention, encourages and supports learning,

increases self-awareness and provides an opportunity to examine and understand their own learning. We think that this situation positively affects students' metacognitive skills, which are effective on

their lifelong learning skills. In this process, it was also helpful to explain to students what is expected of them, both verbally and through shared guides, and to discuss the process with the trainers (29–31,2).

Table 4. Change in scale scores according to sociodemographic variables before and after education

	Pre-test Mean ± SS Median	Post-test Mean ± SS Median	p*
All students	n=239 75.50±8.62 76.00	n=239 80.31±7.93 82.00	<0.001*
Female students	n=125 76.38± 9.33 78.00	n=125 81.65±7.75 83.00	<0.001#
Male students	n=114 74.54±7.70 75.00	n=114 78.87±7.91 79.00	<0.001#
Do you have a physician in your family or the person(s) you feel close to?			
Yes	n=74 74.72±8.94 74.5	n=74 79.34±8.58 79.5	<0.001#
No	n=165 75.85±8.48 77.00	n=165 80.84±7.54 82.00	<0.001#
Did you want to be a physician yourself?			
Yes	n=178 75.70±8.91 76.00	n=178 81.16±7.64 83.00	<0.001#
Partially	n=55 74.96±7.73 75.00	n=55 78.27±8.11 79.50	<0.001#
No	n=6 74.50±8.71 72.00	n=6 76.50±10.03 77.50	<0.001#
Experiencing serious or chronic illness in her/himself or her/his relatives			
Yes	n=132 76.02±8.01 76.00	n=132 81.23±7.93 83.00	<0.001#
No	n=107 74.87±9.33 75.00	n=107 79.32±7.76 80.00	<0.001#
Have you ever received training in communication?			
Yes	n=7 78.86±6.26 76.00	n=7 81.14±5.21 82.00	<0.001#
No	n=232 75.40±8.67 76.00	n=232 80.35±7.97 82.00	<0.001#

*Wilcoxon test, # Two Factor Repeated Measures Analysis of Variance

After the lessons, the students researched, and conveyed examples related to the subject of the lesson. They compiled their examples from the sections they observed and determined in their own environment, films, literature, etc. At the beginning of each lesson, examples were shared and feedback was given. The effort to search and find relevant examples in these resources makes an important

contribution in combining what they have learned with life, in the development of their skills to transfer to their lives, in their orientation to critical thinking, etc. (32–35). We think that sharing homework at the beginning of the lessons also affects students' awareness positively and is motivating. A small group assignment was also given to the students. Each small group was divided into 3–4 subgroups.

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Subgroups watched the interview "CS in Medicine with Prof. Dr. Erbuğ Keskin", which is part of DEUFM Online Wednesday Events, individually. They communicated with each other in written, verbal, and/or video, and compiled and transmit at least 9 communication examples that touched on our course topics from the conversation (https://www.youtube.com/watch?v=bAm2r45Pr-landt=266s).

As part of the end-of-term evaluation, they performed a task designed in line with the learning objectives of the training program. For this purpose, they wrote the script of a mutual interview that included the basic communication elements and made a video recording with themselves in the animation. In the instruction shared with the students, the sample situations and evaluation criteria for the scenario they will construct were clearly stated, and they were asked to obtain verbal and written consent from the person they interviewed in the video recording. Students' knowledge of monitoring and evaluation criteria has a positive effect on their learning processes (2).

Short interactive PowerPoint® presentations used in live lessons, video, movie clips, cartoons, real-life examples, etc., positive/negative examples, instant surveys, written and/or audio question-answer activities, subgroups, and feedback on the asynchronous process made the synchronous/asynchronous periods interactive and increased the active participation of the students in the lesson. Audio-visual materials such as movies, videos, cartoons, etc. are widely used in training in the field of physician-patient communication (35–37). The use of these provides many benefits such as facilitating understanding and remembering, enabling the discussion of different views, triggering critical thinking, different physician-patient interactions, and enabling the student to reflect (38). The feedback given to students about their homework enabled them to find answers to their questions about the subject and to obtain information about their learning processes because feedback is a valuable element of the learning/assessment process (1,2).

Trainers are people who have had responsibilities in face-to-face CS for an average of 5 years. They worked together during the preparation of the distance CS education program. Before each lesson, the next lesson was simulated through Sakai, and constant communication was maintained via the WhatsApp® group. In addition, the trainers responsible for the courses are those who have

previously received training on computer-assisted training at the faculty, as suggested in the literature, and have actually trained and gained experience in the relevant pieces of training (39). In these ways, we think that we have ensured the standardization of trainers. Again, as stated in the literature, we agree that text messages used in synchronous/asynchronous periods through WhatsApp® groups established between students and educators also contribute positively to student motivation (40). In addition, we think that the social dimension of learning is supported by interacting with students in these processes, enabling information exchange and communication among them (41).

As seen in our study, the positive effects of training on CS and/or empathy in medical students are obvious. One point we think important is that these trainings, especially at the beginning of medical education, should be included in all periods of medical education and clinical practices because many studies report that the improvement in students' empathy levels decreases during clinical periods (22,27,42–44).

Limitations of the Study

The absence of a control group and the long-term effect of education were not evaluated, which is a limitation regarding the power of the study design. In addition, the memory factor in survey studies can also be considered as a limitation.

CONCLUSION

As a result, the distance CS education program, in which we used many techniques that support the online learning climate, increased the empathy levels of the students. For this reason, we recommend it as a model that can be used in cases where face-to-face education is impossible and/or to support face-to-face education in medical education. However, there is a need for controlled intervention studies that will compare face-to-face and distance education methods on this topic.

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