Effect of Educational Intervention on Empowering the Sense of Empathy in Medical Students: Application of Health Belief Model

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Abstract

Background and Objectives: Empathy is one of the main skills in establishing a relationship between physicians and patients, and in order to increase this sense in students, it is necessary to introduce systematic and active programs into medical education. The aim of this study is to determine the effect of an educational intervention based on a health belief model on empowering the sense of empathy in medical students.

Methods: This was a quasi-experimental intervention conducted on two groups of 80 medical students involved in the internship program from Tehran University of Medical Sciences in 2015. Sampling was done randomly, and the subjects were randomly assigned to two groups, experimental and control. In the pre-test phase, all students completed a three-dimensional questionnaire including demographic data; a valid, reliable, and standardized Jefferson empathy questionnaire; and a section comprising questions designed by the researcher based on the constructs of the health belief model. Educational intervention was conducted only for the experimental group. To measure the results of educational intervention, the standardized patient questionnaires and the questionnaires completed by the students were used. Data were analyzed by means of frequency, percentage, mean and standard deviation, ANOVA, and independent t-tests.

Results: Before the intervention, the two groups were similar and comparable in terms of demographic variables. After the intervention, there was a significant difference in the mean scores of perceived susceptibility ($P < 0.001$) and perceived severity ($P = 0.002$) between the two groups. The mean scores of perceived barriers and perceived benefits were significant among the two groups ($P < 0.001$). In addition, there were significant differences in the constructs of self-efficacy and cues to action three months after intervention ($P < 0.001$).

Conclusions: Training based on the health belief model was effective in empowering the sense of empathy among medical students. Training on empathy skills is recommended in order to increase patient satisfaction, promote health outcomes, and increase job satisfaction among physicians.

Keywords: Empathy, Communication Skills, Training, Educational Intervention, Health Belief Model

1. Background

Observing the rights of the patient when delivering health services plays an important role in improving the relationship between physician and patient, and this principle is important to managing the health system (1).

One of the important factors in bedside behavior is empathy in the physician's relationship with the patient (2). Empathy is a very important issue in medicine since it increases patient satisfaction and leads to more correct diagnosis and treatment (3).

Oxford dictionary defines empathy as the power of projecting one's own personality into the object of contemplation.

Empathy is an effective and infrastructural process for psychological changes in a physician-patient relationship (4) and consists of two parts: the cognitive part is the ability to recognize the feelings and experiences of others, and the emotional part includes sharing their emotions and experiences. Empathy in medicine is often referred to as its cognitive part (5).

Empathy is a powerful communication ability, which means understanding the experiences, concerns, and views of another, with the ability to show it. In other words, empathy is the ability of someone to put himself/herself in the place of others in order to better understand their emotions and experiences (1).

It has been proposed that physician-patient empathy consists of three main components: "verbal communication with the patient, compassion, and imagination of oneself in place of the patient" (6).

In fact, one of the main skills in establishing a relation-

ship between physician and patient is empathy with the patient, which is an effective and underlying process for psychological changes in a physician-patient relationship (7).

In addition to contributing to the general satisfaction of physicians and patients, the use of empathy skills in medical sciences has resulted in many positive outcomes, including increased efficiency of health services, improving patient acceptance, reducing legal conflicts in medicine, increasing satisfaction, better collaboration, and compliance in patients (8).

If empathy is absent or is insufficient when a physician communicates with the patient for the purpose of history taking, physical examination, diagnosis, and treatment, several problems can arise, including misdiagnosis, inappropriate use of medication, lack of follow-up therapy, wasted time and money for physicians and patients, and occasionally the death of the patient. Therefore, empathy can have a direct impact on clinical outcomes (9).

So far, various studies have examined empathy among different subgroups of students and medical staff. These studies have emphasized the positive effects of empathy on the prognosis and outcome of patients with myocardial infarction and asthma (10).

The results obtained by Pollak et al. showed that physicians rarely respond sympathetically to patients' negative emotions (11).

Studies have proven that correct use of empathy skills not only does not entail problems, but also has many benefits, such as early diagnosis of diseases, treatment of hard cases, cost-effectiveness, and removing the need for emotional effort (12).

Empathy with the patient causes the patient to be isolated from his condition and positively affects the patient's recovery. Establishing a physician-patient relationship based on trust and empathy gives the patient a sense of relaxation.

The brain's response to the stress changes and increases the patient's tolerance. Through listening carefully to their patients, doctors will make patients more satisfied and gain better therapeutic outcomes.

Patients being treated in hospitals need a proper psychological relationship as they need to receive appropriate treatment. Patients who receive insufficient attention are dissatisfied with the treatment system (13).

The effective use of empathy skills, in addition to benefitting the patient, will help the physician to benefit from empathic relationships with the patient (14).

The sympathetic relationship and physicians' satisfaction with the relationships with patients act as barriers to occupational stress and exhaustion in physicians. Empathy is a potential factor for the well-being of physicians (15).

The results of studies on the stability or change in the level of empathy during education have shown that the level of empathy decreases with education in medical schools (16).

Different studies have shown various reasons for the lack of coordination between the physician and the patient, including insufficient time (17), being busy, a focus on treatment in the context of patient problems, and the issue that emotional empathy gets them so emotionally exhausted that they even worry about the subsequent damage to their everyday lives and those of their families (18).

Some have also mentioned the lack of adequate training in this regard. The results of the study conducted by Abu-Akel et al. based on the Jefferson empathy questionnaire and workshop training showed that empathy skills can be taught and learned like other skills (19).

The study by Chen et al. on medical students showed that students who received training on empathy had a higher level of empathy (20).

Considering the important role of empathy in the diagnosis and treatment of diseases, if the level of empathy decreases with education in medical schools, systematic and active programs must be introduced to medical education for empathy empowerment.

Over the past few decades, medical education in our country has seen the emergence of firm endeavors for fundamental and infrastructural changes, both in terms of structure and in terms of content.

Education is about providing opportunities to learn. In most cases, lecturer activity intended to facilitate learning alone or learning with the help of educational materials is named "education."

Education is an activity planned by the teacher to facilitate learning, and this process flows between the teacher and one or more learners in an interactive way.

In other words, education encompasses any kind of pre-planned activity or strategy aiming at facilitating learning (21).

The first step in the educational planning process is to select an appropriate model for education. Since the early 1950s, the health belief model has been widely used in the conceptual framework of behavioral health research and in the description of changes or continuity of health-related behaviors. Based on this model, each person's behavior is influenced by two factors: first, the value placed on a goal by the person, that is, when s/he changes his/her behavior and concludes that engaging in that behavior is beneficial to him/her; and, second, the person's estimation of the probability of achieving the desired goal in case of engaging in the behavior.

The health belief model is based on perceived susceptibility, perceived severity, perceived benefits, perceived bar-

riers, cues to action, and self-efficacy (22).

In the perceived susceptibility construct, a person's belief in the possibility of having a special condition and in the perceived severity construct, and a person's belief in the severity and intensity of a condition are surveyed. In the case of empathy, after examining and internalizing the social outcomes of the lack of empathy, a medical student creates a picture of the severity of the problem, which leads him/her to preventive behavior.

The construct of perceived benefits deals with the person's perception of the extent to which some of the work is done to prevent the problem.

The person chooses a behavior that has the greatest benefit in the first place and is available in the community in the second place.

In perceived barriers, an individual analyzes the cost-effectiveness of the recommended actions and whether the behavior is worth the cost or the time allocated.

The construct of cues to action consists mainly of the internal or external events that determine the individual's readiness to act and stimulate behavior.

The construct of self-efficacy was added to the health belief model in 1988 to better address health problems.

Self-efficacy is a concept first introduced by Bandura in the theory of social recognition or social learning and refers to a person's confidence in his ability to successfully carry out his/her work (23, 24).

Considering that empathy is one of the specialized skills of communication between physicians and patients, it is necessary to address it as a tool for improving the relationship between physicians and patients. The aim of this study was to determine the effect an educational intervention based on the health belief model had on empowering the sense of empathy among medical students.

2. Methods

This study was a quasi-experimental educational intervention with the control group. Eighty medical students who were involved in the internship program from Tehran University of Medical Sciences in 2015 were selected through simple random sampling using a random number table. They were divided into experimental and control groups.

The sample size was calculated based on the results of a pilot study at the 95% confidence level with 80% power. The inclusion criteria included giving consent to participate in the study, being in an appropriate physical condition to answer questions, and the absence of cognitive problems and mental illnesses.

Failure to continue participating in more than one training session was considered an exclusion criterion.

Data were collected using a three-dimensional questionnaire. The first dimension included demographic information (nine items), and the second dimension comprised the valid, reliable, and standardized Jefferson questionnaire for empathy measurement (20 items).

In the Jefferson questionnaire, a physician or intern scores each item between 1 (completely disagree) and 7 (completely agree). The extent of success increases with increments from 1 to 7. The third dimension of the questionnaire was designed by the researcher based on the constructs of the health belief model, including seven questions pertaining to the perceived susceptibility construct, seven questions pertaining to the perceived severity construct, seven questions pertaining to the perceived barriers construct, seven questions pertaining to the perceived benefits structure, seven questions pertaining to self-efficacy, and three questions pertaining to cues to action.

Scale and score of each of the constructs were as follows: completely agree = 5, agree = 4, no idea = 3, disagree = 2, and completely disagree = 1.

The minimum score of the perceived susceptibility structure was 7, and its maximum was 35. The minimum score of perceived severity, perceived benefits, and perceived barriers was 6, and the maximum was 30.

Self-efficacy items were designed based on a four-point scale from not at all (score 1) to very much (score 4).

The minimum and maximum scores for the self-efficacy construct were 6 and 24, respectively. The minimum score for the construct of cues to action was 2, and its maximum was 8. The scale of the last construct of the questionnaire was based on a two-way choice, yes and no.

To assess the validity and reliability of the tool, the questionnaire was completed by 20 medical students at the internship level.

Then, these subjects were divided into two groups, one experimental (n = 5) and one control group (n = 15). Two weeks after the intervention on the experimental group was conducted, the questionnaire was filled out again by both groups; the adjustment was done each time with a 95% confidence interval; and its shortages were resolved. These people were excluded from the main study.

Cronbach's alpha coefficient of the questionnaire was calculated at more than 0.70. The value of the Cronbach's alpha coefficient in the third section of the questionnaire was calculated for each construct separately.

To assess the face validity, the tool was provided to 20 medical interns, and each individual's perception level about the questions was examined, which showed no problem.

All the students completed the sections on demographics, empathy, and health belief model constructs in

the pre-test phase.

The educational intervention was conducted only for the experimental group during a two-stage semester. In the first stage, three workshop sessions of three hours each were held on communication skills training in order to strengthen students' sense of empathy with the patient.

In the second stage, two episodes of patient's history taking were recorded for each student in video format; all components of each episode were analyzed; and then we discussed proposed alternative behaviors with the students.

In the educational workshop, educational films, unfinished stories, lectures, questions and answers, and brainstorming sessions were used for perceived susceptibility and perceived intensity constructs.

For the construct of cues to action, fact sheets were provided to the students.

For self-efficacy, group discussions and practical demonstration techniques as well as problem-solving techniques were employed. All students in the experimental group had an active presence in the training course.

To measure the results of educational intervention, a standardized patient was used in the hospital environment.

After completing the interaction with the student, the simulated patient attempted to fill out a checklist made by the researcher whose validity and reliability had been verified.

After encountering the simulated patient, the students completed the three-dimensional questionnaire assessing the constructs of the health belief model in its third part.

In order to observe ethical standards, after the completion of the post-test, training was also given to the control group. At any stage of the study, people were assured that their information would remain confidential to the investigator. In addition, the admission of the participants to the research was based on informed consent.

To report the distribution of classified data, frequency, and percentage, and to report quantitative data distribution, mean and standard deviation were used.

The difference in empathy scores between both sexes was studied using an independent t-test.

3. Results

In the present study, 80 medical students who were attending an internship program at Tehran University of Medical Sciences in 2015 were enrolled in the study.

Frequency, percentage, and cumulative percentage of empathy scores are presented in Table 1.

Table 1. Frequency, Frequency Percentage, and Cumulative Percentage of Empathy Scores

Empathy Scores	Frequency	Frequency Percentage	Cumulative Percentage
< 75	2	2.50	2.50
80 - 76	5	6.25	8.75
85 - 81	5	6.25	15.5
90 - 86	7	8.75	23.23
95 - 91	9	11.25	35.0
100 - 96	11	13.75	48.75
105 - 101	11	13.75	62.50
110 - 106	14	17.50	80.8
115 - 111	6	7.50	87.50
120 - 116	5	6.25	93.75
125 - 121	2	2.50	96.25
130 - 126	3	3.75	100
135 - 131	0	0	
140 - 136	0	0	
Total	80	100	

The highest frequency of empathy scores was in the range of 106 to 110. The empathy scores by age, gender, and marital status are presented in Tables 2 and 3.

There was no significant relationship between empathy scores and age, gender, and marital status.

There was no significant difference between the scores of males and females based on an independent t-test.

In the section on health belief model constructs, the average score of perceived susceptibility increased after the training in the experimental group, which was statistically significant (P < 0.001).

In addition, a significant increase was observed in the mean score of perceived severity (P = 0.002).

The mean score of perceived barriers after intervention significantly decreased in the experimental group (P < 0.001).

The average score of perceived benefits and perceived self-efficacy increased significantly after the intervention (P < 0.001).

A significant decrease was observed in the mean score of cues to action after the intervention in the experimental group (P < 0.001).

The mean score of empathy in the experimental (2.95 ± 0.45) and control (1.82 ± 0.33) groups after the workshop was significantly different (P < 0.001, t = 14.17).

The comparative results of the mean scores of the health belief model constructs before and after the intervention in the two groups are presented in Table 4. These

Table 2. Empathy Scores by Age and Gender

Variable	Frequency (%)	Min. Score	Max. Score	Mean ± SD
Sex				
Female	54 (43.2)	65	128	110.5 13.3±
Male	26 (20.8)	63	128	110.1 ± 13.1
Age, y				
25 - 20	73 (58.4)	92	128	104.0 ±16.3
30 - 26	7 (6.5)	63	128	103.3 ±12.1

Table 3. Empathy Scores by Marital Status

Marital Status	Frequency (%)	Min. Score	Max. Score	Mean ± SD
Single	56 (70.0)	67	128	14.1 ± 100.0
Married	21 (26.25)	63	128	12.8 ± 110.7
Divorced	1 (1.25)	110	110	110
Not specified	2 (2.5)	-	-	-

differences were statistically significant and showed the effect of an educational intervention based on the health belief model on empathy among medical interns.

4. Discussion and Conclusion

The aim of this study was to determine the effect of an educational intervention based on the health belief model on empowering the sense of empathy among internship students of Tehran University of Medical Sciences.

The results of the study showed a significant difference between the performance of interns before and after the training in empathy skills within the experimental group.

In addition, there was no significant difference between the experimental and control groups before the educational intervention. However, after the intervention group, this difference was significant.

The results of this study show no significant difference between empathy scores by age, gender, and marital status.

In the context of the relationship between empathy and gender, in almost all relevant studies, empathy was significantly higher in women than in men (25-27), but in the present study, the level of empathy among male and female physicians was 110.5 and 110.1, respectively, which did not show any significant difference.

To assess the relationship between age and empathy score in the present study, the interns were divided into two groups according to age, which showed no significant difference between the groups.

A similar result has been reported in another study (28). In addition, the mean score of empathy was 101 in single subjects and 100.7 in married subjects, which showed no significant difference.

The results of several studies indicate that the level of empathy decreases in medical colleges as academic years increase, and this necessitates more attention to the training of these skills.

Several studies have shown that various educational methods can be used to increase the level of empathy in medical students (29, 30).

In the present study, after the educational sessions were completed and the post-test conducted, a significant difference was observed between the mean scores of the constructs of the health belief model (perceived susceptibility, perceived severity, perceived barriers, perceived benefits, self-efficacy, and cues to action) before and after training.

This significant difference indicates the effective use of the health belief model in the education of this group.

Although empathy skills, in contrast to other skills, depend somewhat on personality, the results of this study and many similar studies show that empathy skills can be taught and learned to increase patient satisfaction (11).

Empathy training in medical education programs is often forgotten, and gaining clinical experiences without proper training in these skills can have adverse effects on students' sense of empathy.

The results of Chen et al.'s study showed that the skill of creating an empathic relationship can be taught and has many positive effects on physicians and patients (31).

Other study findings suggested that empathy is an ability that can be taught and learned. Given the importance of this issue, they recommend workshops and training

Table 4. Mean and Standard Deviation of Health Belief Model Constructs Before and After Intervention in the Two Groups[a]

Construct	Before Intervention		After Intervention		P Value
	Control Group (N = 41)	Experimental Group (N = 39)	Control Group (N = 41)	Experimental Group (N = 39)	
Perceived susceptibility	4.32 ± 41946	4.29 ± 20.40	3.88 ± 19.83	3.28 ± 25.54	< 0.001
Perceived severity	4.19 ± 20.54	4.47 ± 21.77	3.82 ± 20.70	3.13 ± 25.29	< 0.001
Perceived barriers	3.98 ± 26.80	3.73 ± 26.23	4.60 ± 26.18	3.23 ± 18.43	< 0.001
Perceived benefits	3.57 ± 20.57	4.86 ± 21.77	3.45 ± 20.60	3.09 ± 26.57	< 0.001
Perceived self-efficacy	3.56 ± 17.54	4.76 ± 18.49	3.58 ± 18.17	3.15 ± 24.91	< 0.001
Cues to action	0.61 ± 5.51	0.61 ± 5.74	0.61 ± 5.49	0.44 ± 3.47	< 0.001

[a]Significance at the level of $P < 0.050$.

courses on empathy for physicians (32).

In the above-mentioned studies (31, 32), as in the present study, empathy skills training had a positive effect on the empathic performance of medical students.

According to the results of this study and similar research, empathy skills training can be considered in the medical curriculums.

In addition, by organizing workshops for medical graduates, effective steps can be taken toward an increase in patients' satisfaction, an increase in their compliance, improvement of health outcomes, and an increase in job satisfaction among physicians.

One of the limitations of this research was that the scope of the project was limited to a university and the examination of the relationship between physicians and patients was not conducted in real-world conditions.

The results of this study show that empathy skills, like other communication skills, can be taught and learned. The positive effects of this intervention can benefit the patient and ultimately improve the community's health level.

Supplementary Material

Supplementary material(s) is available here [To read supplementary materials, please refer to the journal website and open PDF/HTML].

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