

# The Effect of Simulated Patient Education on Critical Thinking Trends in Medical School Students

## Tıp Fakültesi Öğrencilerinde Simüle Hasta Eğitiminin Eleştirel Düşünme Eğilimleri Üzerine Etkisi

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### Abstract

**Aim:** Critical thinking consists of mental processes such as reasoning, analysis and evaluation. It is a form of objective meta-thinking that is open to self-correction and change. The main component of the current education methods is the acquisition of critical thinking. Simulated patient applications in medical educational is an effective method that enables the student to acquire cognitive and psychomotor behaviors with active participation in the learning process. The aim of this study is to determine the change in the critical thinking tendencies of the third-year students of Akdeniz University Faculty of Medicine before and after simulated patient applications.

**Methods:** Third-year students of Akdeniz University Faculty of Medicine in the 2018-2019 academic year participated in the study. The students were asked to apply the Critical Thinking Disposition (CTD) scale forms before the simulated patient applications. In the second stage of the study, the scale was reapplied to the students. The scale consists of 49 items. In our study, the results of the change between the first and the second applications of Critical Thinking Disposition scale were compared with the Paired Sample Test.

**Results:** A total of 345 students participated in the study. The CTD scale consists of 49 items and the Cronbach's Alpha value for the CTD is  $\alpha = .93$ . The mean score obtained from the CTD scale of the whole group was 191.63 (SD = 21.07) in the fall term and 193.69 (SD = 23.63) in the spring term. Although there was an increase in mean values of CTD scale, the difference was not statistically significant ( $t(344)=-1.09, p = 0.277$ ).

**Conclusions:** The multidimensional nature of critical thinking skills and the need for continuity in order to keep this skill sharp are considered effective on this result. Different applications can be added to the education program to develop this skill.

### Özet

**Amaç:** Eleştirel düşünme; akıl yürütme, analiz ve değerlendirme gibi zihinsel süreçlerden oluşur. Kendi kendini düzeltmeye ve değişime açık nesnel üst düşünme biçimidir ve günümüz bilgi çağı için temel bir beceri olarak kabul edilmektedir. Mevcut eğitim yöntemlerinin temel bileşeni eleştirel düşünmenin kazanılmasının sağlanmasıdır. Tıp eğitiminde simüle hasta uygulamaları öğrencinin öğrenme sürecine aktif katılımı ile bilişsel ve psikomotor davranışların kazanılmasını sağlayan etkili bir eğitim yöntemidir. Aynı zamanda bu uygulama, öğrencilere teorik bilginin gerçek ortamdaki uygulamasının nasıl

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olabileceğini güvenli bir ortamda deneyimleme şansı vermektedir. Bu çalışmanın amacı, Akdeniz Üniversitesi Tıp Fakültesi dönem üç öğrencilerinin simüle hasta uygulaması öncesi ve sonrası eleştirel düşünme eğilimlerindeki değişimin saptanmasıdır.

**Yöntem:** 2018-2019 öğretim yılında Akdeniz Üniversitesi Tıp Fakültesi üçüncü sınıf öğrencileri çalışmaya katılmıştır. Öğrencilerden simüle hasta uygulaması öncesi Eleştirel Düşünme Eğilimi (EDE) ölçek formlarını uygulamaları istenmiştir. Çalışmanın ikinci aşamasında uygulama yapan öğrencilere ölçek bir kez daha uygulanmıştır. Ölçeğin geçerlilik ve güvenilirlik çalışması 2016 yılında Semerci N. tarafından yapılmıştır. Ölçek çok boyutlu olup, 49 maddeden oluşmaktadır. Çalışmamızda birinci EDE ölçeği sonuçları ile ikinci EDE ölçeği arasındaki değişimin sonuçları Paired Sample Test ile karşılaştırılmıştır. **Bulgular:** Çalışmaya toplam 345 öğrenci katılmıştır. 49 maddeli ölçeğin Cronbach Alpha değeri  $\alpha = .93$  gerçekleşmiştir. Tüm grubun EDE ölçeği ortanca değeri ilk dönem 191.63 ( $SS = 21.07$ ), ikinci dönem 193.69 ( $SS = 23.63$ ) bulunmuştur. EDE ölçeğinin ortalama değerlerinde artış olmasına rağmen, fark istatistiksel olarak anlamlı değildir ( $t(344) = -1.09, p = 0.277$ ).

**Sonuç:** Eleştirel düşünme becerisinin çok boyutlu olmasının ve sürekliliğe ihtiyaç duymasının sonuç üzerinde etkili olduğu düşünülmektedir. Eleştirel düşünmenin kademeli gelişimi göz önüne alınarak eğitim programı içerisine bu becerinin geliştirilmesi için farklı uygulamalar eklenebilir.

## INTRODUCTION

While there are many definitions of critical thinking, the most general definition is the analysis of facts to form a judgment. This way of thinking involves analyzing the facts in a rational, skeptical, and impartial way (1,2,3). It is recognized as a basic skill for today's information age. Critical thinking includes five basic structures; being active, being independent, being open to new ideas, taking into account the evidence and reasons supporting the ideas, organization. (4).

Critical thinking education aims to gain the skills of discriminating between facts and claims, to test resource reliability, inferring information about irrelevant information, being aware of bias and cognitive errors, asking effective questions, using verbal and written language effectively and thinking (meta-cognition) (1,5).

Critical thinking has five main rules: coherence, integration, application, competence, and communication. Critical thinking is seen as a basic skill of today's educational programs within the framework of these rules (3,6). Critical thinking in medical education is recognized as a reliable and effective way to achieve a better clinical judgment. Critical thinking education is an important tool for educating health workers who can predict

problematic situations in medical education and health services and make the right decisions in challenging environments (7,8).

In order to gain critical thinking skills, medical education methods used today; problem-based learning (PBL), simulated patient applications, and community-based education applications are the methods that the student is actively involved in (9,10,11). At the same time, this practice gives students the chance to experience how theoretical knowledge can be applied in the real-world in a safe environment (12).

When the studies on critical thinking skills are examined, it is seen that various critical thinking inventories are used to determine the students' critical thinking skills (13,14). In Canada, Europe, and the United States, in addition to the research conducted for the development and dissemination of critical thinking (15,16), studies are showing the contribution of critical thinking interventions to medical education programs (10,14,17,18,19,20). Critical thinking is a reliable measure of the quality of the clinical reasoning process (8). In a study conducted by Dan Pu et al (9). Critical thinking skills were found to be a factor in the success of 1st and 2nd-grade students of medical school (18).

In the literature review, no study showing the contribution of simulated patient education to critical thinking in pre-graduate and post-

graduate medical education was found. The aim of this study is to present the results of the changes in the critical thinking tendencies of the third-year students of Akdeniz University Faculty of Medicine before and after simulated patient applications.

## **METHODS**

Since 2013, at the Akdeniz University Faculty of Medicine, simulated patient interviews have been conducted in the Simulation Laboratory of the Department of Medical Education. The application rooms are equipped with a camera system.

### ***Participants***

The Critical Thinking Disposition (CTD) scale was administered to the students before the simulated patient application in the 2018-2019 academic year.

### ***Procedure***

The educational materials related to the basic skills to be used were delivered to the students. The students were informed about the functioning in the briefing room before the simulated patient interviews. Applications were made within a certain time. Before starting the clinics, students develop their professional skills with simulated patient interviews using appropriate interview techniques accompanied by realistic scenarios. Simulated patient interviews give students the chance to experience how real-world application of theoretical knowledge can be experienced in a safe environment. After the application, the students completed a short feedback questionnaire on the process and its functioning. Written and verbal feedback was given to the students through the feedback forms filled by the simulated patients and the camera recordings.

### ***Assessments***

The CTD scale was developed by N. Semerci in 2016 (21). The construct validity of the scale

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was found to be valid and reliable as a result of confirmatory factor analysis and reliability analysis calculations. Cronbach's alpha coefficient of the CTD scale is 0.93. The scale consists of 49 items. The scale has five dimensions, all of which are positive. The subscales of the scale are metacognition (14 items), flexibility (11 items), systematicity (13 items), perseverance-patience (8 items) and open-mindedness (3 items). These dimensions mean:

*Metacognition:* A person's awareness of and control of their thinking processes.

*Flexibility:* Even if it seems to be true, renunciation of judicial evidence, on the contrary, is to have a broad perspective in evaluating events.

*Systematicity:* Organized, planned and careful research tendency.

*Perseverance-patience:* A determination to overcome obstacles.

*Open-mindedness:* It means being tolerant of different approaches and being sensitive to its own mistakes.

Grading of propositions; fully agree (5), mostly agree (4), partly agree (3), mostly disagree (2), disagree at all (1). It is arranged in a five-level Likert-type scaling format. It is predicted that as the score obtained in the scale increases, critical thinking ability increases. Data were analyzed using IBM SPSS Statistics 23 © Copyright SPSS Inc. Paired samples t-test was used to compare the mean values of the two groups because the scores obtained from the scale showed normal distribution. In the study, the level of statistical significance was accepted as  $p=0.05$ .

## **RESULTS**

A total of 345 students are female (45%) and male (55%) of the third-year students of Akdeniz University Faculty of Medicine 2018-2019 academic year participated in the study. The study was conducted in 12 groups. The median value of the CTD scale of the whole group was 191 (lowest 126, 237 highest) at the

beginning of the first period. The median value increased to 193 (lowest 70, highest 241) in the second period after the interview. The mean CTD scale was 191.63 (SD = 21.07) in the first period; The second period was 193.69 (SD =

23.63). Although there was a positive increase in mean values of the CTD scale, no statistically significant difference was observed ( $p= 0.277$ ) (Table 1).

**Table 1.** Mean Score Values from CTD Scale

	Mean	SD	P
<b>CTD (Before training)</b>	191.63	21.07	P=0.277
<b>CTD (After training)</b>	193.69	23.63	

## DISCUSSION

Critical thinking is important at all levels of education. Especially in medical faculties aiming at liberate and scientific thinking, critical thinking takes a much more important step. Therefore, it is important that medical faculties adopt an educational approach that will enable students to develop critical thinking skills (7). The aim of this study was to investigate whether the simulated patient contributed to critical thinking or not. The results showed that the simulated patient application does not make a statistically significant contribution to students' critical thinking skills.

Our study revealed the contribution of simulated patient practice to critical thinking with the CTD scale. Critical thinking is a very comprehensive concept and time is needed for its development (16). We performed our study only over simulated patient applications over a one year period. Therefore, we may not be able to follow a significant change in the overall scale score. It is known that open-mindedness is the primary factor that is effective in improving the preparedness dimension of problem-solving and decision-making processes (9,19). Given the gradual development of critical thinking, the fact that the difference in open-mindedness has emerged as a first step may indicate that the critical thinking process has begun to develop. Tıp Eğitimi Dünyası / Mayıs-Ağustos 2024 / Sayı 70

Simulated patient education also has a number of components for gaining critical thinking skills like PBL (9). Training with simulated patients is structured as a pre-clinical program that focuses on communication skills in Akdeniz faculty and aims to develop patient history and basic education skills (22). Therefore, it includes the steps of questioning, thinking and analyzing. Combining this training with other training strategies may lead to more meaningful results. As a matter of fact, when studies on critical thinking skills are examined, it is found that there is a relationship between education and critical thinking disposition (20,23). In the simulated patient application, there wasn't a score increase in critical thinking disposition open-mindedness sub-dimension.

In a study conducted in California in 1996 for primary and secondary school prospective teachers, it was found that most of them did not have any idea what critical thinking is and what it does to include in education, but those who have received professional training on critical thinking can provide detailed and reasonable calculations on the subject (15). In a meta-analysis study, it is recommended that educators explicitly state critical thinking education interventions in the lessons. As a result of these practices, it was emphasized that critical thinking was also effective in in-service training and faculty development (14). It has been found

that even methods such as discussion, question-answer, and research directed to doctoral students contribute to the development of critical thinking skills of students (24). In some research results, it is stated that there is no significant difference (25,26). These results suggest that different trainings in different sample groups have different results in influencing critical thinking. There are also findings in the studies conducted in the field of medical education that critical thinking skills can prevent nurses and doctors from making medical mistakes while applying clinical decisions (2,8,17,19,20).

Instead of explaining the events from a single point of view, it is one of the suggested methods to develop critical thinking so that students can see and think about what different perspectives might be. The preparation of training programs for critical thinking education in all departments has seemed beneficial for health care providers (27).

## CONCLUSION

Although third-year students of Akdeniz University Faculty of Medicine 's critical thinking disposition scores increased after the simulated patient application, the significant difference was not found. The fact that there is no significant difference in terms of critical thinking dispositions among the third-year students who are newly starting to clinical education suggests that the critical thinking skill stems from the multidimensionality and continuity. Different applications can be added to the training program to develop this skill.

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