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An evaluation of the small group study in the critical appraisal special study module

Eleştirel değer biçme özel çalışma modülünde küçük grup çalışmalarına dair bir değerlendirme

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INTRODUCTION
Critical appraisal is one of the steps towards evidence-based medicine. Today, the production of new knowledge is quite rapid and its evaluation is becoming increasingly difficult. To overcome these difficulties, educational activities incorporating critical appraisal practices in medical education programmes have found a place in curricula around the world.
The aim of this study is to determine the opinions of trainers and students about the practice that is included in the Critical Appraisal Special Study Module (CA-SSM), which is carried out as a structured programme in Dokuz Eylül University Faculty of Medicine (DEUFM) and is carried out as a small group study.

METHOD
The population of the study consisted of 417 students who took CA-SSM in DEUFM Term 2 in the academic year 2023-2024 and 32 trainers who participated in the exercises. The opinions of the students and trainers were collected electronically using two different forms. They were asked to give a score between 0 and 5 for each item.
Percentage distributions, means and standard deviations were calculated for both groups. The Mann-Whitney U tests were used in the analyses. $p < 0.05$ was set as the statistical significance level. Thematic analysis was used for qualitative data.

RESULTS
The response rate for students was 51.8% and 62.5% for trainers. The mean for all items evaluated by both groups was above three points. The highest mean belongs to the item "level of preparation of trainers for practice" with 4.56 for the students and to the item "sufficiency of time allocated for practice" with 4.55 for the trainers. There was no statistically significant difference between the mean scores of the students according to their gender for any of the items ($p>0.05$ for all).
The most common theme in the written feedback was that the application was instructive and useful for the students, while for the trainers the placement of the application within the programme affected the students' performance.
There was no statistically significant difference between the students and the trainers in their evaluation of the articles used in the application. However, there was a statistically significant difference between the groups in terms of student participation and the evaluation of the adequacy of the time allocated for implementation (M-W U=1532,000 p=.023 and M-W U=1342,000 p=.003, respectively).

DISCUSSION
Students and trainers find the CA-SSM implementation valuable. Although the feedback from students and trainers on the CA practice is generally positive, it is important to make arrangements in line with the data obtained to increase the efficiency effectiveness of the practice. In order to enrich the programme and increase its educational impact, it would be appropriate to carry out studies to evaluate all its components.

KEYWORDS
Critical appraisal, evidence-based medicine, medical education, student feedback, trainer feedback

AMAÇ
Kanıta dayalı tıp uygulamalarına yönelik adımlardan biri eleştirel değer biçmedir. Yeni bilginin üretilmesi günümüzde oldukça hızlıdır ve değerlendirilmesi de giderek zorlaşmaktadır. Bu zorlukları aşmaya yönelik olarak tıp eğitimi programlarında eleştirel değerlendirme uygulamalarını içeren eğitsel etkinliklerin tüm dünyada müfredatlarda yer bulduğu görülmektedir. Bu araştırmanın amacı Dokuz Eylül Üniversitesi Tıp Fakültesi' nde (DEÜTF) yapılandırılmış bir program olarak sürdürülen Eleştirel Değer Biçme Özel Çalışma Modülü'de (EDB ÖÇM) yer alan ve küçük grup çalışması olarak sürdürülen uygulama hakkında eğitim yönlendiricileri ve öğrencilerin görüşlerinin belirlenmesidir.

YÖNTEM
Araştırmanın evrenini, 2023-2024 akademik yılında Dönem 2'de EDB ÖÇM' si alan 417 öğrenci ve uygulamalarda görev alan 32 öğretim görevlisi oluşturmaktadır. Öğrenci ve eğitim yönlendiricilerinin görüşlerine ait veriler, iki farklı form aracılığı ile elektronik ortamda toplanarak elde edilmiştir. Her bir madde için 0-5 arasında puanlama yapmaları istenmiştir. Her iki grup için yüzde dağılımlar, ortalama ve standart sapmalar hesaplanmıştır. Analizlerde ki-kare ve Mann – Whitney U testleri kullanılmıştır. $p < 0,05$, istatistiksel anlamlılık sınırı olarak alınmıştır. Nitel veriler için tema analizi yapılmıştır.

BULGULAR
Öğrenciler için ulaşma oranı %51,8; eğitim yönlendiricileri için %62,5'tir. Her iki grupda değerlendirdikleri tüm maddeler için ortalama üç puanın üstündedir. Öğrencilerde en yüksek ortalama 4,56 ile 'Eğiticinin uygulamaya hazırlık düzeyi' maddesine, eğitim yönlendiricilerinde 4,55 ile 'Uygulamaya ayrılan sürenin yeterliliği' maddesine aittir. Öğrencilerin cinsiyetlerine göre puan ortalamaları arasında hiçbir maddede istatistiksel olarak anlamlı bir farklılık saptanmamıştır (tümü için $p> 0,05$). Yazılı geri bildirimlerinde en sık karşılaşılan tema, öğrenciler açısından uygulamanın öğretici ve yararlı olması iken, eğitim yönlendiricileri için uygulamanın program içindeki yerinin öğrenci performansını etkilemesi olmuştur.
Uygulamada kullanılan makalelerin değerlendirilmesinde öğrenciler ve eğitim yönlendiricileri arasında istatistiksel olarak anlamlı bir fark saptanmamıştır ($p> 0,05$). Ancak öğrenci katılımı ve uygulamaya ayrılan sürenin yeterliliğinin değerlendirilmesi açısından gruplar arasında istatistiksel olarak anlamlı bir farklılık vardır (sırasıyla M-W U=1532.000 p= ,023 ve M-W U=1342.000 p= ,003).

TARTIŞMA
Öğrenciler ve eğitim yönlendiricileri, EDB ÖÇM uygulamasını değerli bulmaktadır. EBD uygulamaları için öğrenci ve eğitim yönlendiricilerinin geri bildirimleri genel olarak olumlu yönde olsa da ettiğimiz veriler doğrultusunda düzenlemeler yapılması uygulama verimliliğinin artırılması açısından önemlidir. Programın zenginleştirilmesi, eğitici etkisinin artırılabilmesi amacıyla tüm komponentlerinin değerlendirilmesine yönelik çalışmalar yapılması uygun olacaktır.

ANAHTAR KELİMELER
Eleştirel değer biçme, eğitici geri bildirimi, kanıta dayalı tıp, tıp eğitimi, öğrenci geri bildirimi

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Healthcare services provided without the use evidence-based practices may result in missed opportunities to benefit patients and could potentially cause harm. The five steps of evidence-based medical practice were first described in 1992 (1). One of these steps the critical appraisal of evidence for validity, clinical relevance, and applicability (2).

For the critical appraisal process to be effective, health care providers must be able to acquire, evaluate, integrate and use new information in their decisions to meet current needs. However, the rapid production of new knowledge in the field of medicine today presents challenges. Access to the rapidly evolving literature has become increasingly difficult for users due to time constraints, inadequate in the presentation of findings, and the wide dispersion of the literature across numerous publications.

To address these challenges, many studies on effective reading and the critical appraisal of medical research literature have been conducted and discussed since the 1980's (3-4). Numerous guides have been published to assist in reading and critical appraisal of articles. The literature highlights the importance of organizing educational activities to develop the ability to critically assess evidence for validity and clinical significance (2).

Critical evaluation and evidence-based medicine are now widely incorporated into the curricula of undergraduate and postgraduate medical education programmes around the world. However, there are differing views in the literature about the impact of these programmes, which vary in implementation and level (5–11).

The aim of this study is to determine the opinions of training facilitators and students regarding the application of the Critical Appraisal Special Study Module (CA-SSM). This module is implemented as a structured programme at Dokuz Eylül University Faculty of Medicine (DEUFM) and conducted as a small group study.

Materials and Methods

CA-SSM is an educational programme that has been implemented in our faculty since the 2019–2020 academic year. It aims to equip students with the skills to research scientific literature and critically analyze the accessed literature in terms of design and methodology. Initially conducted online during the COVID-19 pandemic, the CA-SSM has resumed as a face to face programme after the pandemic.

Throughout the spring semester, second-year students receive various theoretical presentations within the CA-SSM. These presentations cover topics such as the concept of scientific research, types of research, and statistical analysis (Table 1).

Table 1. CA-SSM theoretical presentation titles

Basic concepts in scientific research
Data, information, and knowledge management in health
Types of research
Scan engines
Case control studies
Cohort studies
Research, technology, and publication ethics
Hypothesis tests
Types of articles and critical article reading
Introducing the critical article reading app
Basic biostatistics concepts
Biosafety training
Clinical studies
Sample size and sampling methods
CA-SSM application

Upon completion of the theoretical sessions, students are divided into groups of 11–12 and participate in two practical sessions. In these sessions, two research articles—one epidemiological and one experimental—are critically evaluated under the guidance of training facilitators.

Prior to the practical sessions, participants are provided with articles and evaluation guides prepared according to international guidelines to facilitate their evaluations. In addition, an introductory session is organized for the training facilitators to familiarize them with the articles and evaluation guides used during the sessions.

During the practical sessions, the groups are expected to discuss and critically evaluate the research articles based on the evaluation criteria provided, guided by the facilitators.

The assessment of the CA-SSM is conducted through an exam consisting of multiple-choice questions, held immediately following the practical sessions. The score of this exam contributes 5% to the student's overall grade at the end of the year.

The study population consisted of 417 students enrolled in Term 2 at Dokuz Eylül University Faculty of

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Medicine during the 2023–2024 academic year, all of whom participated in the Critical Appraisal Special Study Module (CA-SSM), and 32 training facilitators who provided guidance during the CA-SSM sessions. No sampling was used; data were collected from all students and facilitators who voluntarily agreed to participate in the study. Only data from participants who completed the data collection forms completely and accurately were included in the analysis, and incomplete forms were excluded.

Two separate data collection forms were developed using Survey Monkey: one for the students and another for the training facilitators. These forms were distributed immediately after the second implementation session using QR codes and link-sharing methods. Data was collected anonymously in an electronic format.

For the students, data were collected on gender and their views on small group work, including the importance of acquiring critical appraisal skills for the medical profession, the compatibility of group work with theoretical courses within the CA-SSM framework, the adequacy of the application period, the appropriateness of the articles used for the purpose of the application, the trainers' level of preparation for the application, and the level of participation of the students in the group during the application. The students were asked to rate these aspects on a Likert-type scale: 0 for no opinion, 1 for very bad, 2 for bad, 3 for neither good nor bad, 4 for good, and 5 for very good. They were also asked an open-ended question to about their general opinions of the application.

For training facilitators, data were collected specialty, gender, training onin evidence-based medicine, institution where training in evidence-based medicine was received, experience with critical appraisal training, and their views on small group work. These views included the suitability of the articles used the appropriateness of appraisal forms the adequacy of the time allocated for the application, the students' preparation for the application, and the general level of student participation during the appraisal. Facilitators were also asked to ate these aspects on a Likert-type scale: 0 for no opinion, 1 for very bad, 2 for bad, 3 for neither good nor bad, 4 for good, and 5 for very good. They were also asked to give open-ended feedback on the application.

Statistical analysis

Frequency and percentage distributions, means, and standard deviations were calculated separately for both groups. The Mann-Whitney U Test was applied for comparisons between students and training facilitators. A p-value of < 0.05 was considered the threshold for statistical significance.

For the qualitative data collected through open-ended questions in both groups, theme analysis was conducted independently by two researchers from the research team. A consensus on the themes and theme expressions was reached through comparative evaluations performed collaboratively. All analyses were conducted using SPSS version 24.0 (IBM, Armonk, NY, United States).

Ethical approval

The study was conducted after receiving approval from the Dokuz Eylül University Faculty of Medicine Non-Interventional Studies Ethics Committee (DEÜ GOAEK, Decision No: 2024/18-16, Date: 22.05.2024).

Results

Student feedback

A total of 235 students completed the student questionnaire. However, 19 questionnaires were excluded from the analysis due to incomplete data, leaving 216 completed questionnaires for analysis. The student response rate was 51.8% (216/417). Of the respondents, 56.0% (121 students) were male.

The average group score for each item evaluating the application was above three points. The highest average score was for the item "Trainer's level of preparedness for application," with an average of 4.56 (Table 2). Additionally, 70.4% of the students (152 individuals) rated the trainers' level of preparedness for practice as "very good." The lowest mean score, 3.55, was for the item "Group study is compatible with the theoretical courses I have taken within the scope of CA-SSM" (Table 2).

For this item, 49.1% of the students (106 individuals) chose the "I agree" option (Table 3).

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Table 2. Average scores of the items for the evaluation of the application by the students (N=216)

	Average	SD
Acquiring critical appraisal skills is important for the medical profession*	3.91	1.16
Group study is compatible with the theoretical courses I have taken within the scope of CA-SSM*	3.55	1.21
Trainer's level of preparation for application **	4.56	.87
Participation of students in the group in the application**	4.01	1.02
The suitability of the articles used in the application for the purpose of the application**	3.86	1.08
Adequacy of time allocated for application **	3.81	1.22

Table 3. Distribution of student responses for the item 'Group work is compatible with the theoretical courses I have taken within the scope of the CA-SSM' (N=216)

	Number	%
No opinion	4	1.9
I totally disagree	14	6.5
I disagree	26	12.0
I neither agree nor disagree	27	12.5
I agree	106	49.1
I totally agree	39	18.1
Total	216	100.0

When the mean scores of the students were compared based by gender, no statistically significant difference was found between the scores of female and male students for any of the items ($p > 0.05$ for all items).

A total of 36.6% of the students (79 individuals) provided written feedback. Theme analysis of the written feedback identified 11 main themes. The most common theme was that the CA-SSM was an instructive and useful practice, as expressed by 46.8% (37 students). The second most common theme was criticism of scheduling of the practical on the same day as the theoretical exam for the CA-SSM, which was noted to have negative impact on participation in terms of both quantity and quality (Table 4).

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Table 4. Themes in student written feedback (N=79)

	Number	%
The order should be arranged with other SMs.	1	1.3
The physical environment is not suitable	1	1.3
Not practical	1	1.3
Statements related to theoretical presentations of the CA-SSM, not aimed at practice	2	2.5
Implementing applications that include methods to ensure more active participation of students in the application process.	2	2.5
The duration of the application is long	2	2.5
An unnecessary application	5	6.3
The number of applications should be increased	5	6.3
Good group harmony with the training facilitator and related satisfaction	6	7.6
Having the CA-SSM theoretical exam and the practical exam on the same day reduces participation both qualitatively and quantitatively.	17	21.5
CA-SSM application is an instructive and useful application.	37	46.8

Training facilitator feedback

Feedback from training facilitators showed a reach rate of 62.5% (20/32). Of the training facilitators who provided feedback, 65.0% were female, and 65.0% were employed in basic sciences (Table 5). In addition, 40% (8/20) of the facilitators were participating in this practice as trainers for the first time.

Table 5. Distribution of lecturers who gave feedback in the CA-SSM application according to their scientific fields and gender

		Number	%
Fields of science	Basic Sciences	13	65.0
	Internal Sciences	5	25.0
	Surgical Sciences	2	10.0
	Total	20	100.0
Gender	Woman	13	65.0
	Male	7	35.0
	Total	20	100.0

Of the training facilitators who responded to the survey, 75% (15/20) had previously received training in critical appraisal, and 66.7% of these 15 facilitators received their training at our faculty. The group average for each item scored for the evaluation of the application was above three points. The highest average score was for the item "Sufficiency of time allocated for application," with an average of 4.55 (Table 6). The lowest average score was for the item "Students' level of preparation for application," with an average of 3.55 (Table 6)

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Table 6. Average scores of the items for the evaluation of the application by the training facilitators (N=20)

	Average	SD
The suitability of the articles used in the application for the purpose of the application*	4.25	.786
Suitability of evaluation forms for purpose*	4.50	.607
Adequacy of time allocated for application*	4.55	.686
Students' level of preparedness for practice*	3.55	.945
Participation of students in the group in the application*	4.00	1.076

Half of the training facilitators (50.0%, 10/20 individuals) provided written feedback. Theme analysis of this feedback revealed 5 main themes. The most common theme, cited by 40.0% (4/10) of the facilitators, was the low number and quality of participation due to the scheduling of the practice on the same day as the theoretical exam for the CA-SSM. The second most common theme, expressed by 30.0% (3/10) of the facilitators, was that the CA-SSM application is an instructive and useful practice (Table 7).

Table 7. Themes included in the written feedback from the training facilitator (N=10)

	Number	%
The application should be structured by presenting sample article referees.	1	10.0
The number of applications should be increased	1	10.0
The student's performance in the application should be reflected in the SM grade.	1	10.0
CA-SSM application is an instructive and useful application.	3	30.0
Having the CA-SSM theoretical exam and the practical exam on the same day reduces participation both qualitatively and quantitatively.	4	40.0

Among the parameters evaluated by the students and training facilitators, the student's participation in the practice, the appropriateness of the articles used in the practice for the purpose and the appropriateness of the duration of the practice were common parameters. When the scores given by the students and the training facilitators on these items were compared, no statistically significant difference was found between the groups in the evaluation of the appropriateness of the articles for the purpose. However, there is a statistically significant difference between the groups in terms of student participation and the assessment of the adequacy of the time allocated for implementation (M-W U=1532.000 p=.023 and M-W U=1342.000 p=.003, respectively).

Discusion

In our study, the coverage rate was 51.8% for students and 62.5% for training facilitators. The highest average score in the students' evaluations was for the item "The level of preparation of the trainer for the application," with a score of 4.56. In the evaluations by the training facilitators, the highest average score was for the item "Sufficiency of the time allocated for application," with a score of 4.55. When comparing the opinions on the parameters common to both groups, a statistically significant difference was found between the groups regarding student participation and the adequacy of the time allocated for the practice.

The thematic analysis revealed that the themes identified in both groups were similar, emphasizing the benefits of the implementation and the importance of proper time planning in the programme. Students have no prior knowledge or skills in critical appraisal from their previous educational experiences. For this reason, it is crucial that they

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receive structured training in critical appraisal and reinforce it through practice, as noted by Gupta (12). CAS training activities are implemented in different ways worldwide (13–15). Introducing this practice at an early stage of training and structuring it throughout the curriculum is considered valuable.

Students who complete the CA-SSM develop the ability to plan, conduct, and report research as a team in the Research Skills SM programme, which is part of the third year curriculum. To be successful in this programme, students must demonstrate skills in literature review and critical appraisal. Inadequate training in the critical appraisal of scientific literature presents a significant barrier to the delivery of conducting the Research Skills SM programme (16).

Both training facilitators, and students, find the CA-SSM valuable. However, critical factor in the program success is its duration, an issue highlighted by both groups. The inclusion of the CA-SSM theoretical exam in the programme immediately after the second implementation session was found to have reduced participation both quantitatively and qualitatively. Nevertheless, the application provides an opportunity for a quick review of topics covered in the exam, such as type of research types, sample size, and research direction.

Low participation in the application process and exam anxiety among participants are likely to have affected the reach rate among students. In addition, although receiving feedback is often a challenging process (17), this alone does not fully explain the low response rate among training facilitators. Investigating the reasons for the low participation of faculty members in research processes and their reluctance to provide feedback could be a topic for future research.

When the responses to the common items were compared, a significant difference was observed between the training facilitators and students in terms of student participation and the assessment of the appropriateness of the time allocated for practice. This difference may be due to the fact that trainers tend to expect higher levels of student participation and may feel more pressure to use time due to multitasking.

Special Study Module (SM) programmes are important components that strengthen and enrich medical education curricula. However, this study did not aim to evaluate the CA-SSM programme as a whole. Instead, it focused solely on the application within the programme. To further improve the programme and maximize its educational impact, it would be beneficial to conduct comprehensive studies that evaluate all components together.

Although the student and training facilitators feedback on CAS practices generally scored three or above, it is important to make adjustments based on the findings of this research to improve the effectiveness of the practice in the next academic year. These improvements will help to ensure that the programme continues to meet its educational objectives effectively.

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