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Evaluation of e-Problem-Based Learning (e-PBL) Sessions in the Faculty of Medicine During the Pandemic Period

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ABSTRACT

Abstract: In our research, we aimed to evaluate the opinions of students and academicians about PBL carried out with distance practice(e-PBL) in a medical faculty during the pandemic period.

Methods: Class 1, 2 and 3 students who participated in the e-PBL sessions at Sivas Cumhuriyet University Faculty of Medicine(SCÜTF) in the 2020-2021 academic year and faculty members who served as Educational Guides(EG) in these sessions participated in our descriptive cross-sectional study. After each PBL session, the Department of Medical Education(AD) routinely applies a PBL feedback questionnaire to the entire student population and an EG evaluation form consisting of 6 statements for them to evaluate the educational guides. This year, additional questions about online education were added to the feedback surveys in distance education. The data of the study were analyzed in SPSS 25.0 program and descriptive statistics, chi-square and Student-t were used.

Results: A total of 509 students and 32 faculty members participated in our research. There was a significant difference between the PBL education guide(EG) scores of the students in the face-to-face education period in 2019-2020 and the PBL education guide scores given by distance education this year ($p<0.05$). 59.4% (n=19) of the academicians stated that they felt more comfortable in the face-to-face PBL session. 90.6% (n=29) of the academicians said that the students were more active in the face-to-face PBL session. 87.5%(n=28) thought that the opportunities for discussion were more in face-to-face education. In e-PBL, all of the students expressed themselves verbally only. They did not prefer to use different computer programs such as graphics and presentation preparation. 46.9% (n=15) of the faculty members stated that distance PBL training was productive, 28.1% (n=9) were undecided on this issue, and 25.0% (n=8) found it inefficient.

Conclusion: The sessions, which were implemented as e-PBL under pandemic conditions, were met positively by the majority of the students and the education guides, despite their shortcomings.

Keywords: Problem-based learning, pandemic, medical education

Pandemi Döneminde Tıp Fakültesindeki e-Probleme Dayalı Öğrenme (e-PDÖ) Oturumlarının Değerlendirilmesi

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ÖZ

Amaç: Araştırmamızda bir tıp fakültesinde pandemi döneminde uzaktan uygulama(e-PDÖ) ile yürütülen PDÖ hakkında öğrencilerin ve akademisyenlerin görüşlerini değerlendirmeyi amaçladık.

Yöntem: Tanımlayıcı kesitsel tipte olan araştırmamıza 2020-2021 eğitim öğretim yılında Sivas Cumhuriyet Üniversitesi Tıp Fakültesinde(SCÜTF) e-PDÖ oturumlarına katılan dönem 1, 2 ve 3 öğrencileri ve bu oturumlarda Eğitim Yönlendiricisi (EY) olarak görev alan öğretim üyeleri katıldı. Tüm öğrenci evrenine her bir PDÖ oturumundan sonra Tıp Eğitimi Anabilim Dalı(AD) tarafından rutin olarak PDÖ geri bildirim anketi ve eğitim yönlendiricilerini değerlendirmeleri için 6 ifadeden oluşan bir EY değerlendirme formu uygulanmaktadır. Bu yıl uzaktan eğitimde geri bildirim anketlerine çevrimiçi eğitimle ilgili ek sorular eklenmiştir. Çalışmanın verileri SPSS 25.0 programında analiz edilmiş olup tanımlayıcı istatistikler, ki-kare ve Student-t kullanıldı.

Bulgular: Araştırmamıza toplamda 509 öğrenci, 32 öğretim üyesi katıldı. Öğrencilerin 2019-2020 yılında yüz yüze eğitim döneminde gerçekleştirilen PDÖ eğitim yönlendiricisi(EY) puanları ile bu yıl uzaktan eğitimle verilen PDÖ eğitim yönlendiricisi puanları arasında anlamlı bir farklılık vardı ($p<0,05$). Akademisyenlerin %59,4(n=19)'ü yüz yüze PDÖ oturumunda kendisini daha rahat hissettiğini belirtti. Akademisyenlerin %90,6(n=29)'sı öğrencilerin yüz yüze PDÖ oturumunda daha aktif olduğunu söyledi. %87,5(n=28)'i tartışma olanaklarının yüz yüze eğitimde daha fazla olduğunu düşünüyordu. e-PDÖ' de öğrencilerin tamamı kendini sadece sözel olarak ifade etti. Grafik, sunum hazırlama gibi farklı bilgisayar programlarını kullanmayı tercih etmemişlerdir. Öğretim üyelerinin %46,9(n=15)'i uzaktan PDÖ eğitimlerinin verimli olduğunu,%28,1(n=9)'u bu konuda kararsız olduğunu, %25,0(n=8) verimsiz bulduğunu ifade etti.

Sonuç: Pandemi şartlarında e-PDÖ şeklinde uygulanan oturumlar öğrencilerin çoğunluğu ve eğitim yönlendiricileri tarafından eksikleri olmakla beraber olumlu şekilde karşılanmıştır.

Anahtar sözcükler: Probleme dayalı öğrenme, Pandemi, Tıp Eğitimi

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Introduction

The Covid-19 pandemic, which has been affecting the whole world since the end of 2019, has negatively affected life in every field. Education is one of the areas that are most affected by this situation and that may lead to irreparable results. It is estimated that 1.5 billion students in the world are affected by this situation. Many education systems continue to struggle with the current situation. In many educational institutions, the distance education process was started quickly with internet-based methods. However, the search for solutions to negative situations such as the inability of some of the students to access education due to lack of internet access, the adaptation problem of schools and educators to the process, the decrease in the socialization of students, their ineffectiveness in developing skills and attitudes, and the problems experienced in practice-oriented courses still continue [1,2]. The most important problems in this regard in medical education are the inability to practice skills and the continuation of interactive learning techniques such as problem-based learning (PBL), TASK-based learning, and teamwork-based learning. It is necessary to design digital environments in which these techniques can be applied, to provide trainers with the skills to manage the process in the online environment, and to cooperate more with students than in a face-to-face environment [3, 4].

PBL is a student-centered approach that has been implemented in many health education programs around the world for over 50 years, since it was first introduced in the program at McMaster University in 1969. With this method, it is aimed to develop students' communication, cooperation, critical thinking, clinical decision-making, and problem-solving skills [5,6]. The transfer of problem-based learning to the digital environment is not a new situation, it is being used more and more in health professions education. According to the results of a recent meta-analysis, digital PBL is as effective as traditional PBL and can be more effective than traditional learning in improving knowledge. However, for these applications, program development methods and appropriate preparation processes are followed [7]. After the pandemic, most medical faculties had to move their existing education programs suitable for face-to-face application to the digital environment without adequate arrangements. In this research, our aim is to evaluate the opinions of students and academicians about PBL, which is carried out remotely during the pandemic period in a medical faculty.

Methods

Research type

This study is a descriptive/cross-sectional research.

Design

The research population consists of the students who participated in the PBL sessions with distance education at Sivas Cumhuriyet University Faculty of Medicine (SCÜTF) in the 2020-2021 academic year, and the faculty members who served as Educational Guides (EG) in these sessions. The total number of students studying at SCÜTF during the specified academic year is 773. There are 236 students in class one, 289 students in class two, and 248 students in class third. The number of faculty members serving as EY in PBL sessions this academic year is 59.

After each PBL session, the Department of Medical Education routinely applies a PBL feedback questionnaire to the entire student population and an EG evaluation form consisting of 6 statements for them to evaluate the educational facilitators. Students give a score between 1 and 5 to their EG for each statement here. This year, additional questions about online education were added to the feedback surveys in distance education. These feedback surveys are communicated to students through a closed online communication program they use to communicate among themselves. There are no feedback surveys routinely administered to academics. The frequency of answering the questionnaire is shown in Table 1.

In the faculty where the research was conducted, in the 2020-2021 academic year, the courses were given synchronously with distance education. PBL sessions were held with the Microsoft Teams program provided by the university free of charge to students. PBL sessions were held in the 2020-2021 academic year with the same number of students in groups as in the face-to-face education program in the 2019-2020 academic year.

The feedback received from the academicians has not been received before, and has been taken to measure their views on distance education under the conditions of the pandemic.

After obtaining the necessary ethics committee permission for the research, the PBL EG feedback questionnaires for the year 2019-2020 and 2020-2021 filled by the students from the archive of the medical education department and the PBL feedback results of the academicians for the year 2020-2021 were taken and evaluated with the statistical program.

Statistical methods used

Data were analyzed using SPSS (Statistical Package for Social Sciences) for Windows Version 25 program. The normality analysis of the numerical data was analyzed with the Shapiro-Wilk test. First, descriptive statistical analyzes of the data were made**.** Frequencies for categorical data and measures of central distribution (Mean ± Standard Deviation) for numerical data were calculated. Chi-square test was used to compare categorical data. Student's T test was used to compare numerical data between two categorical variables. The results were evaluated at the 95% confidence interval and the significance level of $p<0.05$.

Permissions

Ethics committee approval for the study was obtained from Cumhuriyet University Non-Invasive Clinical Research Ethics Committee (2021/10-30).

Results

A total of 5 Problem-Based Learning (PBL) sessions were held in the 2020-2021 academic year. There is one PBL session in the fall semester in Class 1 Education Program (EP), 2 PBL sessions in the fall and spring semesters in Class 2 EP, and 2 PBL sessions in the fall and spring semesters in Class 3 EP. 59 faculty members took part in 5 PBL sessions. In total, 509 students and 32 faculty members responded to the feedback survey. The information of students and faculty members is given in Table 1.

Table 1. Information of students and faculty members

	n	%	Total Universe Number *
Students			
Class 1	113	22.2	236 (47.8)**
Class 2 Fall	88	17.3	289 (30.4)**
Class 2 Spring	61	12.0	289 (21.1)**
Class 3 Fall	114	22.4	248 (45.9)**
Class 3 Spring	133	26.1	248 (53.6)**
Education Guide			
Place of duty			
Basic	17	53.1	37 (45.9)**
Clinic	15	46.9	22 (68.1)**
Average number of e-PBL (O±SS) (min-maks)	1.8±1.0 (min:1-maks:4)		
* Class size of 1,2,3 students; Number of academicians working in PBL during the year			
**Percentage of participation in online survey			

The PBL education guide (EG) scores of the students in the face-to-face education period in 2019-2020 and the PBL education guide scores given by distance education this year are given in Table 2.

Table 2. Educational guide mean scores in e-PBL and Face-to-face PBL sessions

	e-PBL EG Scores	Face-to-face PBL EG Scores	p
Contribution to the Learning Process	4.7±0.6	4.9±0.3	**<0.001**
Contribution to the Development of Critical Thinking	4.7±0.6	4.9±0.3	**<0.001**
Contribution to the Development of Independent Learning Skills	4.7±0.6	4.9±0.3	**<0.001**
Contribution to the Development of Assessment Skills	4.7±0.6	4.9±0.3	**<0.001**
Contribution to the Development of Communication Skills	4.5±0.7	4.9±0.3	**<0.001**
Motivation Activity	4.7±0.6	4.9±0.3	**<0.001**
EG: Education guide			
e-PBL EG Scores: e-PBL applied in the 2020-2021 pandemic education period			
Face-to-face PBL EG Scores: PBL applied face-to-face in the 2019-2020 academic year			

The answers given by the students and faculty members to the statements given about the e-PBL sessions held during the distance education period are given in Table 3.

Tablo 3. Evaluation of e-PBL sessions held in the distance education period from the perspective of students and faculty members

	Student	Education Guide	p
Student feels more comfortable			
Face to face PBL	230 (45.2%)	14 (43.8%)	**0.005**
e-PBL	93 (18.3%)	13 (40.6%)	
Both equal	186 (36.5%)	5 (15.6%)	
It is more effective in improving students' problem-solving skills			
Face to face PBL	239 (47.0%)	26 (81.3%)	**<0.001**
e-PBL	72 (14.1%)	1 (3.1%)	
Both equal	198 (38.9%)	5 (15.6%)	
More effective in helping students achieve their learning goals			
Face to face PBL	198 (38.9%)	25 (78.1%)	**<0.001**
e-PBL	109 (21.4%)	1 (3.1%)	
Both equal	202 (39.7%)	6 (18.8%)	
Session time is more convenient			
Face to face PBL	112 (22.0%)	16 (50.0%)	**0.002**
e-PBL	176 (34.6%)	5 (15.6%)	
Both equal	221 (43.4%)	11 (34.4%)	
It is easier to reach the session			
Face to face PBL	86 (16.9%)	11 (34.4%)	**0.049**
e-PBL	264 (51.9%)	15 (46.9%)	
Both equal	159 (31.2%)	6 (18.8%)	
Supports teamwork more			
Face to face PBL	315 (61.9%)	29 (90.6%)	**0.001**
e-PBL	45 (8.8%)	1 (3.1%)	
Both equal	149 (29.3%)	2 (6.3%)	
Total	509 (100%)	32 (100%)	

In addition to the statements in Table 3, additional questions were asked to the faculty members. The answers they gave were as follows. 59.4% (n=19) of the academicians stated that they felt more comfortable in the face-to-face PBL session. 90.6% (n=29) of the academicians said that the students were more active in the face-to-face PBL session. 87.5% (n=28) thought that the opportunities for discussion were more in face-to-face education. 65.6% (n=21) of the faculty members stated that the rate of students attending the course was higher in face-to-face PBL sessions.

The answers given by the academicians to the questions about the system they used while conducting the PBL session remotely are shown in Table 4.

Table 4. Opinions of the academicians about the system they use while conducting the e-PBL session

	n	%
Attendance status of students with camera and microphone		
Mostly	11	34.4
Partially	16	50.0
Very little	5	15.6
Benefiting from additional platforms outside the university's program		
Yes	2	6.3
No	30	93.8
Benefiting from additional presentations and videos other than the scenario slides provided		
Yes	3	9.4
No	29	90.6
Utilization of additional tools (whiteboard, meeting notes, etc.) in the program used by the university		
Yes	15	46.9
No	17	53.1
Methods students use when presenting their work		
Verbal expression	32	100
Preparing a presentation	4	12.5
Using graphs, tables and drawings	5	15.6

46.9% (n=15) of the faculty members stated that distance PBL training was productive, 28.1% (n=9) were undecided on this issue, and 25.0% (n=8) found it inefficient.

In e-PBL, all of the students expressed themselves verbally only. They did not prefer to use different computer programs such as graphics and presentation preparation.

Discussion

Under the pandemic conditions, medical faculties in the world and in our country have reorganized their education systems and tried to continue their education processes thanks to electronic information sharing programs. PBLs, which have an important place in medical education, were also done remotely in this process[8]. In this study, the feedback of faculty members and students for e-PBL, which was applied for the first time due to the pandemic, was evaluated.

In a study by Coşkun et al. on the readiness level of medical faculty faculty members for e-learning; the rate of reaching the universe created by the researchers was found to be 0.29(106/363) [9]. In our study, the rate of reaching the universe in terms of faculty members was 0.5(32/59), while the participation rate of students was 0.65 (509/773). This result suggests that the faculty members and students participating in our study are also volunteers to both learn and contribute to the subject.

According to our research, the majority of students and academicians stated that they found e-PBL to be efficient and effective, even though it had deficiencies compared to face-to-face application. In their meta-analysis study, Car et al. stated that digital PBL is as effective as traditional PBL and even more effective in improving knowledge [7]. Again, similar to our study; In a study conducted on students in ophthalmology internships in China, they found that e-PBL aroused more interest in students and was more effective in improving their problem-solving skills [10]. In the study of Rahman et al. in which they evaluated the perspectives of students and EG on e-PBL sessions, they obtained results very similar to those in our study, and the majority evaluated them as productive [11].

In the study in which Ankara Yıldırım Beyazıt University (AYBU) Faculty of Medicine faculty members evaluated their views on distance education methods, they stated that the majority of faculty members did not contribute to students' lifelong learning skills due to the lack of mutual interactions in distance education compared to formal education, and they eliminated the mechanism of giving feedback to students [12].In the study conducted by Foo et al., published in 2021, it was reported that participants in e-PBL sessions performed lower than face-to-face PBL [13].

In our faculty, the PBL method has been applied once in class 1 and twice in classes 2 and 3 since 2007. It was done digitally for the first time in the 2020-2021 academic year. In the study of Ağadayı et al., they found that the scores given to the EGs decreased significantly when they received EG feedback from the students via an online questionnaire for the PBLs performed face-to-face for the first time [14]. Similarly, in our study, we found that EG score averages decreased significantly in e-PBL compared to face-to-face PBL. The reason for this may be that students score more easily without showing personal information, or there may be a decrease in the performance of EGs in the online environment.

In different studies in the literature, similar to our research, students stated that it is easier to reach the course in distance education and e-PBL. Again, they determined that the lessons can be watched again and the suitability of the lesson session durations are advantages in terms of education in the digital environment [15-17].

Conclusion

PBLs, which are small group activities that support case-based learning and teamwork, have a very important place in medical education. Even making it as e-PBL instead of completely removing it from the program due to pandemic conditions has been found productive for faculty members and students. However, there are important points that need to be developed for future applications for e-PBL.

Limitations of the study

The results cannot be generalized since our study was conducted in a single center. There is a need for studies with broad participation in which this process is evaluated together in terms of both educators and students.

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