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Review

Forensic Medicine Education in Problem Based Learning: The Case of Pamukkale University

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Abstract: As a result of the health system and legal regulations in our country, primary care physicians have a great number of responsibilities related to forensic medicine services, but it is a known fact that our physicians describe forensic medicine as the most feared task because of the insufficiency of undergraduate forensic medical education.

A horizontal and vertical integration, spiral structured training program is implemented at Pamukkale University Faculty of Medicine. While they learn the basic concepts in the first years, in the fifth grade they take active education methods through the two-week task. In this forensic medicine education, it will enable the students to develop their interest in forensic medicine and to achieve the objectives of gaining knowledge, skills, and attitude in the core program. In this study, the undergraduate forensic medicine education model of Pamukkale University Faculty of Medicine is presented in detail.

Keywords: Forensic Medicine Education, Task-Based Learning, Problem-Based Learning

Öz Ülkemizdeki sağlık sistemi ve yasal düzenlemeler sonucunda birinci basamak hekimlerine, adli tıp hizmetleri ile ilişkili çok sayıda sorumluluk yüklenmiş olmakla birlikte mezuniyet öncesi adli tıp eğitiminin yetersizliği nedeniyle hekimlerimizin adli hekimlik görevini en çok korkulan görev olarak nitelendirdikleri bilinen bir gerçektir.

Pamukkale Üniversitesi Tıp Fakültesi'nde (PÜTF) yatay ve dikey entegrasyonu sağlanmış, spiral yapılanma gösteren bir eğitim programı uygulanmaktadır. PÜTF'deki adli tıp eğitim programında öğrenciler adli tıp konularıyla birinci sınıftan itibaren karşılaşmaktadırlar. İlk yıllarda temel kavramları öğrenirken, 5. sınıfta ise iki haftalık task boyunca aktif öğrenme yöntemlerinin kullanıldığı bir eğitim almaktadırlar. Adli tıp eğitiminde bu şekilde yıllara yayılmış, interaktif yöntemlerin uygulandığı, yapılandırılmış beceri eğitimi etkinliklerinin yer aldığı eğitim programlarının öğrencilerin adli tıp konularına ilgilerini artıracak, çekirdek programda yer alan bilgi, beceri ve tutum kazanma hedeflerine ulaşmalarını sağlayacaktır. Bu çalışmada PÜTF adli tıp eğitim modeli ayrıntılı olarak sunulmuştur.

Anahtar Kelimeler: Adli Tıp Eğitimi, Taska Dayalı Öğrenim, Probleme Dayalı Öğrenim

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Ethical Declaration

Permission letter dated 07.02.2019 and number 9245 was obtained from Pamukkale University non-interventional clinical research ethics committee for our study.

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1. Introduction

Primary care physicians have been assigned numerous responsibilities related to forensic medicine services as a result of the health system and legislative regulations. It is a known fact that our physicians describe forensic medicine as the most feared task because of the insufficiency of undergraduate forensic medical education. In various studies and meetings, the lack of forensic medicine education in medical schools has been stated as the beginning of the problems faced by physicians in conducting forensic medicine services (1, 2). In the meetings of the Deans Council by Medicine Faculty of Higher Education Council, it is observed that decisions have been made regarding the review of forensic medicine education programs before graduation.

On the other hand, in parallel with the developments in the world, medical education programs are changing in our country. Pamukkale University Faculty of Medicine (PAUMF) has been using the active training method in student education since 1999. This training has been conducted in the first three years under the name of active problem-based training and under the name of task-based training in the next two years. In the active education process, unlike traditional medical education, our students encounter forensic medicine subjects from the first year of medical school. Forensic Medicine Faculty members are also engaged in pre-graduation medical education from the early years. This article is aimed to present PAUMF as an example of pre-graduation forensic medicine education as a medical school using the active training method.

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2. Development of Forensic Medicine Education Program in PAUMF

As a department, our pre-graduation education program at the Faculty of Medicine was first established in 1997. The contents of the first program were prepared by taking into consideration the needs of other medical schools in our country and forensic medicine programs. In subsequent years it has also been reviewed twice according to the national core program (3). At the end of each education period, both the content and the educational strategies are constantly shaped according to the observations of the faculty members and the feedback of the students.

3. Period of Study

In the first three years of the PAUMF training program, active problem-based training is implemented, and task-based learning is implemented in grades 4 and 5. The method mentioned is a training program with horizontal and vertical integration, showing spiral structure (4, 5). In the first, second and third grades, the students' encounters with forensic subjects begin with the learning objectives in problem-based learning sessions and presentations made in these modules. In grade 1 "forensic approach to cases", in grade 2 "approach to trauma patient" and "the child criminal responsibility", in grade 3, "medical malpractice", "forced treatment in schizophrenia", "the responsibility of the emergency physician", "about end of life ethical issues", "legal and ethical issues in the process of termination of pregnancy" is one of the titles within the module.

In addition, in the first three-semester education period of PAUMF students, Forensic Medicine faculty members are also employed in special study modules (SSM). SSM is educational activities that provide students with opportunities to learn in depth in a field, to establish and develop the foundations of scientific method, to learn self, to reach knowledge, to develop the skills to present the results of the study in written, oral and visual form, and etc. (6). With these practices, the students who choose the SSM opened by the Forensic Medicine faculty members, meet both forensic and forensic faculty members in the first years of medical education and do projects under the guidance of the faculty members. Independent practices such as the SSM make it a good option for students to meet Forensic Medicine in the early years of their medical education. Our students are successful in this field. Our students who prepared the SSM study titled "A look at the theme of death in Turkish Folk Music" which was opened by our department received the poster award at the National Medical Education Symposium 2017 (7) and the presentation made by the students organized by Faculty of Medicine, Dokuz Eylül University. It was met with interest at the 10th SSM Symposium.

Students who pass grade 5, a two-week forensic medicine task in a block called multisystem-II block which consists of tasks belonging to five different disciplines that are not directly related to each other. This task is repeated 4 times during the school year with different groups of students. The forensic medicine task program includes task presentation, task sessions, clinical skill practices, examination of deceased, autopsy and outpatient practices, presentations, independent learning processes and academic activities of the department. This task program is presented in Table 1.

Table 1. The Task Program of Forensic Medicine

(1. WEEK)								
	Monday	Tuesday	Wednesday	Thursday	Friday			
08:00-08:45		Autonomous Learning	Autonomous Learning	Autonomous Learning	Autonomous Learning			
08:55-09:40	Introduction of Task 1st. Task session	Presentation <i>Death and Postmortem Interval</i>	Practice	Practice	Practice			
09:50-10:35	Presentation <i>Approach to forensic cases and forensic reports</i>							
10:45-11:30								
11:40-12:25	Presentation <i>Wounds</i>	<i>Forensic Autopsy G1/ Policlinic G2</i>	<i>Forensic Autopsy G2/ Policlinic G3</i>	<i>Forensic Autopsy G3/ Policlinic G1</i>				
12:25-13:30	Lunch Break	Lunch Break	Lunch Break	Lunch Break	Lunch Break			
13:30-14:15	Practice	Presentation <i>Firearm Injuries</i>	Presentation <i>Crime Scene Investigation</i>	Presentation <i>Traffic Accidents and Forensics</i>	Presentation <i>Forensic Psychiatry</i>			
14:25-15:10			Conference <i>Asphyxia Deaths</i>	Presentation <i>Child Deaths</i>	Presentation <i>Sudden deaths from natural causes</i>			
15:20-16:05	Preparing of Forensic Report	Presentation <i>Laboratory and Paternity in Forensic Medicine</i>	Department Event <i>Bodies Removed From Water</i>	Department Event Child Abuse	Department Event			
16:10-16:55			Autonomous Learning	Autonomous Learning	Autonomous Learning	Juvenile Delinquency		
(2. HAFTA)								
	Monday	Tuesday	Wednesday	Thursday	Friday			
08:00-08:45	Autonomous Learning	Autonomous Learning	Autonomous Learning	Autonomous Learning	Autonomous Learning			
08:55-09:40	Practice	Practice	Practice	Presentation <i>Alcohol and Forensics</i>	Presentation <i>Identification in Forensics</i>			
09:50-10:35				Forensic Autopsy G1/ <i>Policlinic G2</i>	<i>Forensic Autopsy G2/ Policlinic G3</i>	Presentation <i>Expertness</i>	Presentation	
10:45-11:30								
11:40-12:25								Legal Responsibilities Of The Physician
12:25-13:30	Lunch Break	Lunch Break	Lunch Break	Lunch Break	Lunch Break			
13:30-14:15	Practice	Presentation <i>Human Rights and forensics</i>	Presentation <i>Pregnancy-birth and forensics</i>	Practice <i>Forensic Examination of Deceased</i>	Task Evaluation			
14:25-15:10						Presentation <i>Sexual Assaults</i>	Presentation <i>Domestic Violence</i>	
15:20-16:05						Department Event <i>Drug Addiction</i>	Department Event <i>Forensic View Of Community Gender Inequality</i>	Presentation <i>Poisonings</i>
16:10-16:55						Autonomous Learning	Autonomous Learning	Autonomous Learning

The first session, held on the first day of the task, is the process in which the task program is introduced, information about the program such as practices, presentations, academic activities of the department, as well as routine functioning and expectations of the students are explained. After the introduction part of the task, students are divided into 3 groups as 'autopsy group' who will attend autopsy during practice hours, 'polyclinic group' who will be trained at forensic medicine clinic and 'free group' who is expected to do autonomous learning.

Throughout the task, all students are expected to follow at least two postmortem procedures from beginning to end and perform the examination of deceased process in person, accompanied by a medical examiner. The students in the forensic medicine outpatient clinic are divided into smaller groups and observe the evaluation processes of the patients consulted to clinic and discuss them with the faculty members.

Presentations not only consist of lecture presentations but also are enriched with case discussions. Our program also includes structured skills training for students to acquire the skills that they will use in their medical life. It is aimed that every student who finishes the forensic medicine task, will be able to write a proper forensic report. "Practice of Judicial Report Editing" has been developed for this purpose. On the first day of this two-day practice, students are divided into 4 groups and organize the "general forensic examination form" through 4 different forensic case samples, present these reports to the whole group and discuss the reports together with the faculty member who is the executor of the practice. In the second practice, 'general forensic examination form' is distributed to all students. It is asked to fill out the forms appropriately through projected case example on the board and wound photos. Completed forms are collected and evaluated at the end of the practice, feedbacks are provided to the students. Besides, the scores from this practice contribute to the students for their in-task activity evaluation note.

The second structured skill activity in the task is a dead examination. It is aimed that every student who finishes the forensic medicine task will be able to carry out a proper forensic dead examination. In the practice of forensic dead examination, students gather in the training skills laboratory. Divided into two groups, they move into two different halls. Groups are distributed in two different scenarios similar to those in problem-based learning sessions. In these scenarios, the preparations to be made before moving to the scene and what needs to be considered while at the scene are discussed and at the end of the discussion, the skill application step is taken to perform the dead examination. At this step, students are presented

with mannequins dressed according to the script and with wound photographs placed on them. Students perform the dead examination steps to these mannequins accompanied by a practical guide prepared for them. Finally, the two groups combine to present the forms they have filled out throughout the practice and discuss them with the faculty members (8).

With the department events, it is tried to be reached some learning goals by discussing about current events with edited reports and experienced cases. For instance, while mentioned 'Crimes against sexual inviolability', in this regard, a phenomenon that has recently cost society through the media, is addressed in all aspects. The missing forensic reports about this case are reviewed and the students reach the correct conclusion.

Independent learning times are processes in which students meet their learning needs under the guidance of faculty members or from a variety of sources.

4. Assessment and Evaluation Process

Measurement and evaluation is not done with a single exam as in traditional educational processes. All activities of the student during the task are evaluated. Students have 'Study Record Cards' that contain the assignments they need to do during the program. Each student is obliged to complete the activities included in the report card throughout the task. In this way, the regular participation of students in the in-task activities is also provided.

Students' absentee status in the task, "general forensic examination form" organized in the forensic report practice, mini written exam results made by faculty members in the task and active participations in practices are evaluated. An in-task activity grade is given for the forensic medicine task by the instructor in charge of the task. At the end of the block, a written exam consisting of multiple-choice questions and a structured oral exam are conducted. In the structured oral exam, students are asked questions about cases they may encounter in real life, accompanied by short scenarios and photographs. In all these assessment and evaluation results, it is observed that our students have achieved their learning goals.

5. Feedbacks of Students

Students receive written and oral feedback at the end of each task. In the directions of these feedback, the task program can be reorganized.

Examples of feedback from 154 students who participated in the forensic medicine task in the 2017 - 2018 academic year were presented in order to show students' reactions to the applied program.

- The majority of students stated that they were satisfied with the task process and the interest of the faculty members in general and that they had an efficient task.

"I think the applications and courses are very efficient, beautiful, instructive and educational. Our teachers and assistants have also been very helpful."

"It was a planned, instructive and very useful task. We conducted one-to-one examinations and autopsies with active training."

"Both the lectures and the narration were very interesting."

"The forensics task was one of the most productive weeks in medical school, where we evaluated every minute of it so well."

- There have been students who have indicated a change in attitudes towards forensic medicine and forensic medicine expertise.

"My perspective on forensics has changed. I understood that I needed to learn my rights and responsibilities."

"Normally I would think of the law as boring, but I loved forensics, and I think our teachers played a big part in it."

"Now, when I see an unpleasant death, my first reaction is not to be shocked, I will think about the technical details we learned to clarify the incident. Now forensics has risen to the top of the list of branches that I seriously intend to specialize in."

"There was an awareness of what a profession we were doing in association with law."

- Some of the students stated that they felt more adequate and secure against future problems related to forensic medicine.

"I learned what problems I could face and what I had to do."

"I'm sure It'll be very useful in my career."

"I feel like we've had our responsibilities, the situations we'll face when we graduate. Seeing these things in advance will add a lot to us."

"I learned important information for my future medical life, and with that information I learned well in this task what I can do in difficult situations."

- Students stated that participation in forensic case assessments and forensic report applications in outpatient clinic were reinforcing to learn about the approach to forensic cases; and, their participation in the autopsy and the practice of the dead examination contributed to the process of learning about this issue;

even, they have learned permanently by being given the chance to practice what is told theoretically.

"The practice of autopsy in particular was very instructive. It was one of the most productive tasks I've ever had."

"The faculty was one of the most diverse tasks I've ever taken on in my life. It was quite interesting to be involved in the practices and the fact that the issues were different."

"It was one of the most instructive and active passing tasks of the fifth grade."

"In polyclinic, we examined patients together, talked about the cases, discussed them, and it was productive."

"It was really instructive and catchy to reinforce the subjects with practices."

"It was very helpful to fill out a forensic case report in class."

- They stated that they learned by doing group work on their practices during the Task, completing each other's deficiencies.

"Our practices in the form of group work were very enjoyable."

- Some of the students suggested that groups consist of fewer people, that more autopsies be performed, that the number and duration of theoretical presentations be shortened.

"The lessons were sufficient but the classes of autopsies could be increased."

"Some of the lessons were exhausting to take long."

"Applications could be made with smaller groups."

When the attendance status of the students was examined, it was seen that the participation rate of the forensic medicine task of 156 students who enrolled in grade 5, was 95.2% in the 2017-2018 academic year.

6. Conclusion

One of the most important differences and advantages of PAUMF forensic medicine education is the beginning of the early years of Education. In accordance with the spiral structured training program, students encounter forensic subjects through patient scenarios in the first years and prepare for clinical training in the following periods (4).

In the early years of medical education, special study modules can also be an opportunity for students to become acquainted with forensic subjects. Special study modules are an increasingly common practice in medical schools in our country. It is recommended that forensic

faculty members take this opportunity and take an active role in the SSM.

The importance of forensic medicine education before graduation in medical faculties is great in order to ensure that physicians do not have problems with the forensic medicine services that are responsible in accordance with the legal regulations in our country. The positive effects of applied skills training on the learning process such as forensic report writing and forensic dead examination have been shown in the studies (8, 9). Forensic report writing and dead examination practices in the task is one of the most important features of our training. These two activities must be carried out in laboratory conditions, as we do, until full learning is achieved in the students. When viewed by the student, it is observed from task feedback that students participate in forensics-related activities with great enthusiasm and give positive feedback. It is seen that they develop a positive attitude towards Forensic Medicine, understand the relationship between medicine and law, and understand that what they learn in the task will be useful in their professional lives. They also found the applications educational and wanted to increase application times. The 95% complete attendance of the task can also be interpreted in favor of students' interest in the forensics task.

The most important problem we face in the education process is the increasing number of students. Due to the increase in the number of students in recent years, it is known that there are problems especially in the theoretical and outpatient applications of the patient, that large groups force the system and that there is a decrease in the motivations of the faculty members (10). Besides to study in our department, the large increase in the number of students has led to a lack of situations made in previous years such as "attending the hearing in person in court", "application of addictive substances in narcotics branch" and "crime scene investigation branch visit". The forensic medicine task process applied in our department has also adversely affected.

In the Forensic Medicine Education Program in PAUMF, students encounter forensic medicine subjects from the first year onwards. While they learn basic concepts in the early years, in the fifth grade they receive

an education that uses active learning methods during the two-week task. This will increase the interest of the students in forensic medicine subjects and enable them to achieve the objectives of gaining knowledge, skills and attitudes in the core program. It is recommended to develop similar student-centered training programs in order to train physicians with the expected proficiency in Forensic Medicine Education and the success of Forensic Medicine Education.

References

1. Balcı Y. (ed.) Adli tıp hizmet modeli ve insan gücü planlaması, 2007, Adana, https://www.atud.org.tr/wp-content/uploads/2016/07/hizmet_modeli.pdf, (ATUD web sitesi), Access Date: 06.02.2019
2. Kumral B, Ozdes T. Assessment of physicians' approaches to the applications of forensic medicine in Tekirdag province. *J. For. Med.* 2014;28(2):141-53. doi:10.5505/adlitip.2014.76376
3. Mezuniyet Öncesi Tıp Eğitimi Ulusal Çekirdek Eğitim Programı - 2014
4. Kara CO, Aybek H. Pamukkale Üniversitesi tıp fakültesi eğitim programı. E Gürpınar, editör. Düünden bugüne Türkiye'de uygulanan tıp eğitim program örnekleri. Ankara: Türkiye klinikleri. 2018; 57-60
5. Pamukkale Üniversitesi Eğitim Bilgi Sistemi. <http://ebs.pau.edu.tr/BilgiGoster/BolumBilgi.aspx?Ing=1&dzy=3&br=23&bl=7893>
6. General Medical Council (2015) Outcomes for graduates (Tomorrow's Doctors) available from: https://www.gmc-uk.org/static/documents/content/Outcomes_for_graduates_Dec_16.pdf
7. Ulusal Tıp Eğitimi Sempozyumu UTES'17 2017 Bildiri Kitapçığı
8. Zeybek V, Acar K, Kurtuluş Dereli A, Kara CO. Yapılandırılmış Senaryo Eşliğinde Maket Üzerinde Adli Ölü Muayenesi Eğitiminin Değerlendirilmesi. *Adli Tıp Bülteni*, 2018; 23(1): 6-12
9. Demirci Ş, Günaydın G, Doğan KH, Aynacı Y, Deniz İ. Adli rapor düzenlemede uygulamalı eğitimin önemi. *Adli Tıp Dergisi* 2007; 21(1): 10-14
10. Musal B, Kılınç O, Çapa Kaya G. Dokuz Eylül Üniversitesi Tıp Fakültesi klinik eğitim programı ve işleyişine ilişkin eğitici ve öğrenci görüşleri. *DEÜ Tıp Fakültesi Dergisi*, 2016; 30(3): 125-130