

# Perspectives of Usak University faculty of medicine and dentistry students to biochemistry course

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## Abstract

**Aim:** In this study, it is aimed to learn the opinions and thoughts of Uşak University Faculty of Medicine and Faculty of Dentistry students about biochemistry education and teaching and to contribute to the planning and changes of medical education program.

**Material and Methods:** The volunteers who participated in the study consisted of students of Uşak University Faculty of Medicine and Faculty of Dentistry. The study is descriptive. Fifty students from Faculty of Medicine and 60 students from Faculty of Dentistry were included in this study. In the face-to-face survey, the data were collected by asking a total of 40 questions, including demographic (14 questions) and biochemistry lesson satisfaction survey (26 questions). The feedbacks were structured using a Likert-type scale.

**Results:** The age range of the participating students was determined as 17-23 years. Sixty six of the students who participated in the study were female and 44 were male. It was observed that 58.6% of the students of the Faculty of Medicine and 61% of the students of dentistry found the number and duration of theoretical courses sufficient. The students of the Faculty of Medicine (20%) and the students of Dentistry (25%) gave the answer to the question "I come out of the class with an understanding of the subject". They stated that the biochemistry course was explained by associating it with clinical courses (67%) and although they were indecisive, they did not see their education as a waste of time in 57% of the faculty of medicine and 44% of the dentistry.

**Conclusion:** It was observed that all participants were concerned about the lack of theoretical lecture hours. However, although they said that they had difficulty in learning the biochemistry course, it was surprising that they were described in relation to clinical courses and did not see it as a waste of time. It is planned to make arrangements in the curriculum of both faculties considering the results of our study.

**Keywords:** Biochemistry; student; satisfaction.

## INTRODUCTION

The aim of the education in Medicine and Dentistry before graduation is to train qualified medical doctors and dentists for the needs of the society (1). Both Medicine and Dentistry education is a lifelong education and requires being equipped with knowledge and skills to protect human health and to diagnose and treat their diseases well. The training program is prepared in the light of this information and filled in with the content of curriculum to the extent that the core training program is given in accordance with the legislation. In addition to including basic medical sciences such as biochemistry, biology, anatomy and physiology, it extends its field gradually by including molecular genetics and nano sciences (2).

Creating an education system that is both evidence-based and targeting the human element is an ideal approach for medical education in order to train qualified and empathic physicians. Biochemistry education is a multidisciplinary program and has two important components: theoretical and practical. Within the framework of the European Qualifications Framework and the National Core Education Program, the aim of theoretical and practical biochemistry education is to provide the student with the necessary skills for physical, biological and behavioral knowledge, attitude and biochemistry applications in the classroom and laboratory. The necessity to motivate students and encourage them to learn biochemistry with a participatory learning approach combined with both traditional and

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competitive assessment is also mentioned in the studies (2,3,4). The number of Medicine and Dentistry faculties is increasing rapidly in Turkey and the education given in these faculties show significant differences in terms of student profile, assessment system and the characteristics of the academic staff. It is also unclear how much biochemistry should be given or taught to students of Medicine and Dentistry. In this respect, changes can be made in the biochemistry program by evaluating the feedback collected in order to make the curriculum compatible with the students during and after the education. The application of biochemistry courses and the curriculum content in the faculties of dentistry are not as intensive as the faculties of medicine. The aim of our survey is to collect the feedbacks about biochemistry education among the undergraduate students of the Faculty of Medicine and Dentistry, to analyze these feedbacks and to ensure that changes are made in the curriculum if necessary.

## MATERIAL and METHODS

Students between the ages of 17 and 23 who were studying in Uşak University Faculty of Medicine and Uşak University Faculty of Dentistry between 2017 and 2019 were included in the study. The answers of the students who participated in the survey were accepted as the data of our study without selecting a sample. The criteria for being included in the study were being students of Uşak University Faculty of Medicine and Faculty of Dentistry, taking biochemistry courses and volunteering to participate in the study. Students who did not want to participate in the study and students who had not yet taken the biochemistry course were accepted as exclusion criteria. The questionnaire form did not include any information to reveal personal identity of the students. The students who participated in the study signed a voluntary consent form. The study was approved by the Uşak University Faculty of Medicine, Non-Interventional Clinical Research Ethics Committee (decision number: 2019 / 160-01, decision date: 20.03.2019). In addition, written permission was obtained from the Deanship of Uşak University Faculty of Medicine and Faculty of Dentistry before the survey was conducted. Student Information Form including demographic characteristics created as a result of literature review about the categories to be evaluated in the survey included 14 questions, while the questionnaire form included 26 questions. The survey was conducted by telling the students of Uşak University Faculty of Medicine and Faculty of Dentistry to fill out the questionnaires in the classroom environment in about 20 minutes after explaining the purpose, reason and content of the survey in detail. The participants were asked not to write names so that they did not feel pressured when answering the questionnaires. The data obtained from the questionnaire were evaluated by the researchers to carry out the study in the Department of Biochemistry of Uşak University Faculty of Medicine.

## Forming the survey

Step 1: After the literature review, categories were determined and an archive of questions was created from the questions formed for courses such as anatomy, microbiology, physical therapy (5-11).

Step 2: The questionnaires were formed from the hypotheses chosen from hypothesis archive.

The evaluation of the hypotheses in the questionnaires was structured with a Likert Type scale consisting of five parts (Totally disagree:1- Totally agree:5). The results were evaluated accordingly. Although there are different opinions about the minimum number of samples for confirmatory factor analysis applications, there are studies indicating that the number of samples should be at least 100 (12-15). In our study, the number of participants consisted of 110 individuals from the two faculties. The data collected for the purpose of the study were calculated as numbers and percentages.

## RESULTS

A total of 110 volunteering students, 64 (58.18%) females and 46 (41.81%) males, studying at Uşak University Faculty of Medicine and Faculty of Dentistry were included in the study. Demographic characteristics and information form responses are summarized in Table 1 (Table 1). Evaluation of the questionnaire in terms of general information about Biochemistry course and the duration of the course, educational tools and the teaching of the faculty members are given in Table 2 (Table 2) and whether the biochemistry course is sufficient at graduation and what the students think of the biochemistry course are given in Table 3 (Table 3).

**Table 1. Participants' demographic characteristics and information form responses**

	Faculty of Medicine Students		Faculty of Dentistry Students	
	Yes	No	Yes	No
<b>Gender</b>				
F (66)	27		23	
M (44)	39		21	
<b>Age ranges (Ortalama 20,79)</b>	18-24		19-23	
<b>Anatolian and Science High</b>	% 92		% 91.3	
<b>School</b>	-		% 3.3	
<b>Open Edutacion High School Others</b>	% 8		% 5	
<b>Did you choose the Faculty of Medicine / Dentistry yourself?</b>	%20	%80	%19	% 81
<b>Do you want to specialize?</b>	%10	%90	%12	%88
<b>Do you find it right to consult with you about the course?</b>	%5	%95	%5	%95
<b>Would you prefer biochemistry as a specialty?</b>	%5	%95	%1	%99

While biochemistry course is taught with the classical system in the Faculty of Dentistry (84 hours), it is taught with integrated system (126 hours theoretical and 32 hours practical in the first year, 86 hours theoretical and 26 hours practical in the second year). In terms of the demographic characteristics of the participants, it was found that 92% of the medical faculty students and 91.3% of the dentistry faculty students were graduates of Anatolian High School Science High School and Anatolian Teacher Training High

School, while 8% of the medical faculty students and 5% of the dentistry faculty students were graduates of other high schools. In addition, 2 (3.3%) of the dentistry faculty students were graduates of open high school.

In the questionnaire part, which was prepared in line with structured questionnaires prepared for some courses, while 67% of medical faculty students answered the question about the sufficiency of course content as

**Table 2. General information about biochemistry course and evaluation of the course in terms of the duration of the course, educational tools and teaching staff**

		I strongly disagree %	I do not agree %	Undecided %	I agree %	I strongly agree %
<b>The instructors who come to the class come by making preparations</b>	<b>M</b>		4.25	36.17	57.44	2.12
	<b>D</b>		8.33	13.33	63.33	15
<b>I can communicate comfortably with faculty members</b>	<b>M</b>		12	24	52	12
	<b>D</b>		5.08	16.94	54.23	23.72
<b>At the end of the lesson. I'm getting out of class with understanding</b>	<b>M</b>	6..12	22.44	51.02	18.36	2.04
	<b>D</b>	6..55	27.86	39.34	22.95	3.27
<b>Important points are emphasized in the lessons</b>	<b>M</b>	4..08	14.28	34.69	44.89	2.04
	<b>D</b>		13.33	23.33	53.33	10
<b>Biochemistry course is explained in relation to the courses in itself</b>	<b>M</b>	2..04	6.12	46.93	44.89	
	<b>D</b>	3..33	28.33	25	36.66	6.66
<b>Is the number and duration of theoretical courses sufficient?</b>	<b>M</b>	2..17	13.04	26.08	50	8.69
	<b>D</b>	3..38	13.55	22.03	47.45	13.55
<b>Course content contributes to my professional training</b>	<b>M</b>		14.28	34.69	48.97	2.04
	<b>D</b>	6..77	30.50	38.98	20.33	3.38
<b>The continuation of the course is required for the success of the biochemistry course</b>	<b>M</b>	10..41	18.75	45.83	22.91	2.08
	<b>D</b>	8..47	22.03	40.67	20.33	8.47
<b>It is possible to take notes in the courses</b>	<b>M</b>		12.24	22.44	53.06	12.24
	<b>D</b>		13.55	11.86	61.01	13.55
<b>Audio-visual tools are used in the courses</b>	<b>M</b>	2..12	8.51	38.29	42.55	8.51
	<b>D</b>	1..69	13.55	15.25	59.32	10.16
<b>Lessons start and end time is happening on time</b>	<b>M</b>	10..20	22.44	32.65	32.65	2.04
	<b>D</b>		8.19	11.47	68.85	11.47
<b>The physical conditions of the classrooms are suitable for learning.</b>	<b>M</b>	16..32	28.57	32.65	18.36	4.08
	<b>D</b>	3..33	13.33	20	53.33	10

Table 3. Sufficiency of biochemistry course at graduation and students' opinions

		I strongly disagree	I do not agree	Undecided	I agree	I strongly agree
		%	%	%	%	%
<b>I don't see biochemistry as a waste of time</b>	<b>M</b>	4.16	12.5	27.08	47.91	8.33
	<b>D</b>	4	18	34	36	8
<b>I love biochemistry</b>	<b>M</b>	14.28	24.48	36.73	22.44	2.04
	<b>D</b>	16	32	32	10	10
<b>I find that our biochemistry education is sufficient</b>	<b>M</b>	2.04	18.36	57.14	22.44	
	<b>D</b>	20	30	28.33	16.66	5
<b>I would choose this course even if biochemistry was an elective course</b>	<b>M</b>	20.40	40.81	26.53	12.24	
	<b>D</b>	25.80	25.80	27.41	17.74	3.22
<b>I would like to take biochemistry reminder lessons at the end of the Faculty of Medicine / Dentistry</b>	<b>M</b>	4.08	16.32	46.93	26.53	6.12
	<b>D</b>	17.54	22.80	38.59	17.54	3.5

**M:Medical Faculty Students    D: Dentistry Faculty Students**

sufficient and that they agreed instructors taught what they had to teach, 69% of the dentistry faculty students answered this question as agree-totally agree. 58.6% of medical faculty students and 61% of dentistry faculty students thought that the number and duration of theoretical courses were sufficient. It was found that 65% of medical faculty students and 74.5% of dentistry faculty students answered the question "can you take notes in courses?" as agree-totally agree. 50% of both groups stated that they did not experience any problems about finding reference books and that they could communicate with faculty members. While 51% of the medical faculty students thought that the course content contributed to professional development, most of the dentistry faculty students (68%) answered this question as undecided or disagree. While 73% of the medical faculty students answered the question "are you given the chance to come to classes with preparation?" as undecided or disagree, 53% of dentistry students answered the question as agree-totally agree. While 20% of the students answered the item "I leave the class with an understanding of the course" as agree, 25% of the dentistry faculty students answered as agree.

## DISCUSSION

It is very difficult to fit Medical and Dentistry education in our country and in the world into a complete order and program, such as mathematical problems. The rapidly increasing number of faculties of Medicine and Dentistry in our country has become departments in which education gets more and more difficult as a result of

insufficient educational tools and equipment, insufficient number of teaching staff and limited hospital facilities for practice. Biochemistry is a very difficult course to teach and learn among all the Basic Medical Sciences. There is no definite limit on which subject should be taught more comprehensively and which subject should be taught more simply in the curriculum. Many factors such as forgetting the information learned during training, development of new diseases and their test biomarkers, and biased approaches of students leave instructors teaching biochemistry in a difficult situation. The objective of our study was to prevent these problems about biochemistry course, to express that the students had a say in the education they received as a newly founded university and to see what can be done to make students learn a course because they like it, not because they have to. In the first part where the demographic characteristics were analyzed, it was found that 66 (60%) of the 110 volunteering students were female, while 44 (40%) were male and the average age was 20.79.

It was found that the majority of the participating students graduated from Science and Anatolian high schools, which are considered to be high schools with a good education for our country, 7 participants from other high schools and only 2 students from open high schools. It was found that the majority of the Medical and Dentistry students who participated in the survey did not choose their university and their departments voluntarily (80%). Students of both faculties answered the question of "getting students' ideas related with the biochemistry course" as they found the course necessary with a rate of 95%. For the question



"What is required to succeed in Biochemistry?", students of both faculties emphasized that both book and laboratory studies and personal endeavor were important (85%). Both groups answered the question "Would you like to specialize in biochemistry" as "no" with a rate of 90-99%. The students stated that it would be more appropriate to give biochemistry courses in the 2nd and 3rd years and in the morning hours. According to the results of our study, the answers of medical and dentistry students to questions about the content of the education program they received, the duration of courses, the importance of attending the courses, the methods of teaching, physical conditions under which the courses were taught and the significance of biochemistry in medical education were assessed. Although Biochemistry course is given more hours than all other Medical and Dentistry courses, the content of the course overlaps with the curriculum of all branches. As such, it becomes more difficult to teach and understand the course of biochemistry. The answers to questions coincide with their concerns about the insufficiency of theoretical hours. The students' uncertainty about whether or not the biochemistry education they receive is sufficient despite the fact that they have high education hours in the Faculty of Medicine gives clues about increasing the course hours of the biochemistry course. Although the majority of the participants stated that important points were emphasized in the lessons, visual tools were used and faculty members taught after making preparations, both groups emphasized that they were undecided or they disagreed that the method of teaching of the courses facilitated learning and presentation techniques attracted attention. From this, we can conclude that the students are not affected by the lecture and working techniques in terms of focusing on learning but they enjoy learning visually and learn better. In our study, we could not make any evaluations about the laboratory and its functioning since we could not make the students of Dentistry do practical applications. In questions "are you pleased with the teaching of biochemistry theoretical courses in general" and "I do not think that the biochemistry education we receive is sufficient", there were a great number of undecided students in both faculties. It can be understood from the high rate (82%) of I disagree, I totally disagree and undecided responses to the item "biochemistry is the course that makes me feel like studying in this department most" that biochemistry course is not seen as the lesson that makes the students feel like studying in the department most. In a study conducted for the anatomy course, the rate of making students feel that they were in medical school was 45.5% (16). In our study, the students did not define the biochemistry course as a course that made them feel completely like studying in the Faculty of Medicine and Dentistry. Medical education is defined as a process which is open to innovations while completing development. In a study conducted in England, it was emphasized that although reforms are made in medical education, there is a secret curriculum outside the education process including medicine and dentistry, nursing and home care services, and that there

were pressures and constraints in which there was a hierarchical and competitive environment especially during clinical trainings (17).

The most striking result of the survey questions we prepared for Biochemistry course was that although medical faculty students stated that they had difficulty in learning biochemistry, that the course was associated with clinical courses and they were undecided, 57% of medical faculty students and 44% of dentistry faculty students stated that they did not consider it as a waste of time. However, it is thought-provoking that 15% of both groups do not like the course at all. The students stated that they could reach the faculty members during and outside the course. Based on these answers, we can conclude that the faculty members do not show an oppressive attitude while teaching biochemistry. In a study conducted for the teaching of medical biochemistry, it is stated that problem based education with the use of multiple tools will be one of the strategies that can be used to improve biochemistry education in Medical Faculties (18). The education model used in the present study was integrated system, in which the whole curriculum is grouped in subjects and committee exams are made at specific times, for the medical faculty, while it was an annual curriculum in which classical midterms and finals were made. In the present study, the fact that students learned with a role model and test system that they gained in high school and thus could not adapt the teaching method and they responded to items "I leave class with an understanding of the course" , "biochemistry course is sufficient for the duration of the education and for afterwards" and "I am pleased with the general teaching of theoretical courses" as undecided and that they experienced difficulties in understanding and learning the course and their undecided or negative responses about it would be better to repeat the biochemistry course shows the students' concerns about the TUS (Medical specialty examination) and DUS (Dentistry specialty examination). In a study which evaluated anatomy course in terms of academic staff, the academic staff stated that the duration of education and course hours were sufficient during dentistry education and that especially clinical anatomy was useful (19). Even if the contents of biochemistry and anatomy are different, they are the most intense courses during the education. Both are seen as courses that are difficult to learn. In our study, it was found that because of the fact that both groups are still undergraduate students, it was difficult for them to evaluate whether the duration of education was sufficient. The curriculum of newly opened dentistry and medical faculties each year, insufficient clinical studies and students being more prone to technological learning cause students to consider courses as a barrier due to subjects taught in a classical fashion and especially the exam system. As in all courses, the fact that the biochemistry course teaching is not carried to digital medium sufficiently to attract students' interest and also the fact that each student has a different way of learning can decrease success. This brings out the necessity

to adapt more interesting and more practical teaching methods to integrate media information and biochemistry course to increase student motivation and to keep up with new medical and dentistry faculties.

## CONCLUSION

Although students did not regard biochemistry as unnecessary in medical education, both Medical and Dentistry students were worried about the biochemistry curriculum and their inability to learn. It is recommended that in addition to training models in the form of seminars and presentations, contributions should be made to education by using simple, comprehensible and more applied biochemistry subjects rather than complex learning and by making real and practical case studies with a more practical and interesting interpretation. An education program aiming to direct students to learn by increasing the activities of the consultancy services in universities and eliminating the concerns of Medical and Dentistry students towards passing their class should be implemented. In addition, students should be motivated to continue their education after graduation as physicians and dentists who integrate themselves with technology.

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