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Determination of the Opinions about Physiology Education of the Kırıkkale University Faculty of Veterinary Students

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Summary: This study was conducted to determine the attitudes and behaviors of 2-5th grade students who have taken the physiology course at Kırıkkale University Faculty of Veterinary Medicine, towards the course and how they evaluate it in terms of general, teaching method, professional competence and postgraduate education. Some demographic information and opinions of totally 233 students on physiology were gathered voluntarily through questionnaire. Accordingly, most of the students (62.7%) found it appropriate to be given physiology in 2nd grade, while about 53% of them found the theory and practice lecture hours sufficient. Students who considered physiology as necessary for their profession (83.7%) thought that following the lesson (81.1%) in the class and the use of were necessary for learning physiology (90.1%), and it was determined that they allocated fewer than 4 hours per week to physiology while taking the course (89.3%). Although more than half of them (58.4%) stated that they did not have difficulty in learning physiology, the rate of those who really understand the subject was 39.9%. In addition, it was observed that 24% of them could consider specializing in physiology. As a result, it was revealed that most of the students consider the physiology course as one of the basic courses for veterinary education, they prefer visual education, the course meets their expectations, and most of them who want to pursue a doctorate pay attention to postgraduate education in this field. Based on these thoughts of the students, it has been concluded that understanding the importance of the homeostatic mechanisms, given in physiology classes, in preventive and curative medicine practices has been effective.
Key words: Education, student attitude, survey, teaching method, veterinary physiology

Kırıkkale Üniversitesi Veteriner Fakültesi Öğrencilerinin Fizyoloji Eğitimi Hakkındaki Düşüncelerinin Belirlenmesi

Özet: Bu çalışma, Kırıkkale Üniversitesi Veteriner Fakültesi'nde fizyoloji dersini almış olan 2-5. sınıf öğrencilerinin fizyoloji dersine karşı tutum ve davranışlarını ve dersi genel, öğretim yöntemi, mesleki yeterlilik ve lisansüstü eğitim açısından nasıl değerlendirdiklerini belirlemek amacıyla yapıldı. Çalışmaya katılan toplam 233 öğrenciye gönüllülük esasına göre doldurtulan anket formunda bazı demografik bilgiler ve fizyoloji dersi ile ilgili görüşler alındı. Buna göre, öğrencilerin çoğu (%62.7) fizyoloji dersinin 2. sınıfta verilmesini uygun görürken, yaklaşık %53'ü teorik ve uygulama ders saatlerini yeterli buldu. Fizyoloji dersini meslekleri açısından gerekli gören öğrencilerin (%83.7), dersi derste takip etmenin (%81.1) ve anlatımda görselliğin kullanımının fizyoloji öğrenimi açısından gerekli olduğunu (%90.1) düşündükleri, dersi aldıkları süreçte ise fizyolojiye haftada 4 saatten az zaman ayırdıkları (%89.3) belirlendi. Öğrencilerin yarısından fazlası (%58.4) fizyoloji öğreniminde zorlanmadıklarını belirtseler de dersten konuyu anlayarak çıkanlarının oranının %39.9 olduğu gözlendi. Ayrıca, öğrencilerin %24'ünün fizyoloji alanında uzmanlaşmayı düşünebilecekleri görüldü. Sonuç olarak, öğrencilerin çoğunun fizyoloji dersini veteriner hekimlik eğitimi için temel derslerden biri olarak gördükleri ve görsel eğitimi tercih ettikleri, dersin beklentilerini karşıladığı ve doktora yapmak isteyen öğrencilerin çoğunun bu alanda lisansüstü eğitimi tercih edecek kadar önemsedikleri ortaya konuldu. Öğrencilerin bu düşünceleri üzerinde, koruyucu ve tedavi edici hekimlik uygulamalarında fizyoloji dersinde öğrendikleri homeostatik mekanizmaların önemli olduğunu anlamalarının etkili olduğu düşünülmektedir.
Anahtar kelimeler: Anket, eğitim, öğrenci tutumu, öğretim yöntemi, veteriner fizyoloji

Introduction

Physiology is one of the basic courses in all health science departments such as faculty of veterinary medicine. The veterinary physiology course aims to explain and teach how the physiological processes (interaction of cells, organs or systems and all homeostatic mechanisms) occur in the bodies of healthy domestic animals (Diwakar et al., 2007). It takes part in the compulsory courses of the 5-year comprehensive educational processes in faculties of veterinary medicine in Turkey. It makes students ready for forth coming courses that are related to their education. Physiology has also wide and complex topics which are related to each other. For example, to understand the mechanism of renin-angiotensin-aldosterone, it is required to have enough knowledge about few hormones (renin, aldosterone, vasopressin), organs

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(lung, liver, kidney, pituitary gland), and systems (renal, cardiovascular, endocrine) (McFee et al., 2018).

Students take the physiology courses (I and II) in the 3rd and 4th semester in Kırıkkale University Faculty of Veterinary Medicine as a 3h theoretic and 2h practical courses per week. Practical lessons are as essential as theoretic ones. Although the animation, simulation and internet-based application programs used in practical lessons depending on the technological developments provide a number of conveniences; it has been stated that the knowledge learned via practices carried out with live materials, is retained longer by students (Pal et al., 2014; Çevik-Demirkan et al., 2016). Student-centered education programs are very important to train successful and qualified veterinarians. In this context, feedbacks received from students at certain times contribute to revision and development of the education and training process (Boud, 1998; Gözil et al., 2006).

In previous studies, some researchers (Otağ and Otağ, 2013; Kunt, 2014; Ekerbicer et al., 2016) suggested that student feedbacks show how physiology education can be improved. However, there are no studies evaluating the education of physiology course in veterinary faculties. Thus, we aimed to determine the opinions and attitudes of the veterinary students to the physiology course, and competence / necessity of the course in terms of their profession in our university.

Material and Methods

Survey researches reflect or explain the past and current state of a situation (Karasar, 2019). This survey study carried out with the permission (2019/E4042) of Kırıkkale University Faculty of Veterinary Medicine and the approval of the Non-Interventional Research Ethics Committee (Date: 07.08.2019; Decision No: 2019.07.06) in the end of the 2018-2019 academic year.

Totally 233 students from the sophomore to senior, who completed Physiology I and Physiology II courses, joined to the research voluntarily. Survey questions were prepared by utilizing the previous studies (Otağ and Otağ, 2013; Çetkin et al., 2016). According to that, students' demographic information was picked on table 1. Answers of table 2 evaluated the opinions of them on physiology course; table 3 evaluated the attitudes of them; table 4 evaluated the competence/necessity of the course in terms of profession and table 5 evaluated their thoughts for post-graduate education process for physiology course and teaching methods, were prepared according to 3-point Likert scale as "No", "Not Sure" or "Yes". The Cronbach alpha values of each subunits of the questionnaire were between 0.59-0.81.

Data obtained from students' responses were expressed as frequency (n) and percentage (%), while the mean scores of each group, which were generated from answers rated as "No" 1, "Not Sure" 2, "Yes" 3, were compared with demographic data by using student-t test or one-way ANOVA test with SPSS 18.0 package program.

Results

The numbers of male and female students participating in the study were 120 and 113 respectively, and their ages were between 19 and 24 (88.90%) mostly. Almost all of them preferred the veterinary faculty willingly (94.42%) and studied physiology less than 4 hours a week (89.27%). While the 2nd grade students (n=92) were the most participated, 4th grade students

Table 1. Descriptive statistics of the students participating in the research

	Variable	n	%
Gender	Male	120	51.5
	Female	113	48.5
Age	19-21	133	57.1
	22-24	74	31.8
	25≤	26	11.2
Type of faculty preference	Willingly	220	94.4
	Unwillingly	13	5.6
Grade	2nd grade	92	39.5
	3rd grade	84	36.1
	4th grade	27	11.6
	5th grade	30	12.9
Grade point average	≤ 59	54	23.2
	60-79	141	60.5
	80 ≤	38	16.3
Status of course repetition	1 time	168	72.1
	2+ times	65	27.9
Weekly study time to physiology	≤4 hours	208	89.3
	4> hours	25	10.7

Table 2. Students' opinions about physiology course and teaching method

		No		Not Sure		Yes		Mean Score		
		n	%	n	%	n	%	$\bar{X}$	±	SEM
2.1.	Was it appropriate to give the physiology course in the 2nd grade?	50	21.5	37	15.9	146	62.7	2.41	±	0.05
2.2.	Was the theoretical lesson time (3 hours) sufficient for the lesson learning?	55	23.6	53	22.7	125	53.6	2.30	±	0.05
2.3.	Was the practical lesson time (2 hours) sufficient for laboratory applications?	57	24.5	52	22.3	124	53.2	2.29	±	0.05
2.4.	Were the consumables, materials, tools, equipment etc. allocated for the practice lessons sufficient?	35	15.0	36	15.5	162	69.5	2.55	±	0.05
2.5.	Were the number of students in the practice lessons sufficient?	47	20.2	43	18.5	143	61.4	2.41	±	0.05
2.6.	Were the practical lessons explain and supplemented the theoretical lessons?	40	17.2	39	16.7	154	66.1	2.49	±	0.05
2.7.	Was the visuality important for teaching/ learning of the physiology course?	15	6.4	8	3.4	210	90.1	2.84	±	0.03
2.8.	Did you think that the teaching method affects your success in the physiology course?	31	13.3	33	14.2	169	72.5	2.59	±	0.05
2.9.	Could you easily ask a question to the Instructor during the lesson?	28	12.0	28	12.0	177	76.0	2.64	±	0.05
2.10	Could you easily reach the instructor outside of the class?	27	11.6	26	11.2	180	77.3	2.66	±	0.04

(n=27) were the least participated to the research. Grade point average (GPA) of students for the Physiology I and II students was in 60-79 range, and the participants who took the course one time were in majority (72.10%) (Table 1).

According to Table 2, more than half of the students (53%) considered that the durations of both theoretical and practical lessons were sufficient, and the physiology course should be given in the second grade (62.66%). It was observed that most of them (90.13%) thought that the visuality is important for educational process of physiology course, and the teaching method affects their success in physiology (72.53%). Also, they noted that more than 75% of students declared that they could reach or ask a question to the teacher inside or outside of the class.

As shown in Table 3, while most of the students (81.1%) thought that the class participationis a necessity to follow the lesson, fewer of them (47.2%) would attend the course even if attendance were not compulsory. Also, it was determined although most of students (58.4%) noted that they have no difficulties learning physiology, fewer participants (39.9%) declared that they came out of the lesson by understanding of the subject.

More than half of the students thought that theory and practice educations satisfied their expectations. On the other hand, less of them (35.6%) considered that their knowledge of physiology is sufficient. Besides, the proportion of participants who consider physiology is necessary in terms of their profession was higher (83.7%) (Table 4).

Table 3. Attitudes and behaviors of students to the physiology learning-teaching process

		No		Not Sure		Yes		Mean Score		
		n	%	n	%	n	%	$\bar{X}$	±	SEM
3.1.	Did you attend the physiology course regularly?	31	13.3	33	14.2	169	72.5	2.59	±	0.05
3.2.	Was it necessary to follow the lesson in the class in terms of physiology learning?	23	9.9	21	9.0	189	81.1	2.71	±	0.04
3.3.	Would you attend the class even if you did not have to compulsory?	64	27.5	59	25.3	110	47.2	2.20	±	0.06
3.4.	Did you use the textbook or the internet to study physiology?	51	21.9	40	17.2	142	60.9	2.39	±	0.05
3.5.	Did you come out of the physiology lesson with an understanding of the subject?	52	22.3	88	37.8	93	39.9	2.18	±	0.05
3.6.	Did you find the physiology course interesting and enjoyed working?	49	21.0	67	28.8	117	50.2	2.29	±	0.05
3.7.	Did you have difficulty learning the physiology?	136	58.4	40	17.2	57	24.5	1.66	±	0.06
3.8.	Did you think the physiology is based on memorization?	79	33.9	58	24.9	96	41.2	2.07	±	0.06

Table 4. Evaluation on the adequacy of physiology learning-teaching process of the students

		No		Not Sure		Yes		Mean Score	
		n	%	n	%	n	%	X̄	± SEM
4.1.	Do you think the physiology course necessary for your profession?	25	10.7	13	5.6	195	83.7	2.73	± 0.04
4.2.	Do you think your physiology knowledge is sufficient?	67	28.8	83	35.6	83	35.6	2.07	± 0.05
4.3.	Did theoretical physiology education satisfy your expectations?	35	15.0	71	30.5	127	54.5	2.39	± 0.05
4.4.	Did practice physiology education satisfy your expectations?	50	21.5	52	22.3	131	56.2	2.35	± 0.05
4.5.	Was there a conflict between what you learned in the physiology course and your previous knowledge?	153	65.7	42	18.0	38	16.3	1.51	± 0.05

According to the distribution rates of the answers in Table 5, it was seen that the students neither want to specialize in physiology (51.1%), nor they have enough knowledge about postgraduate education of physiology (60.1%).

responses about sufficiency of their physiology knowledge of students in the 5th grade and who took the course more than once were significantly lower than the students in the 2nd grade and who took the course 1 time (P<0.05).

Table 5. Views of students on postgraduate education

		No		Not Sure		Yes		Mean Score	
		n	%	n	%	n	%	X̄	± SEM
5.1.	Do you plan to continue postgraduate education in any department after graduation?	99	42.5	74	31.8	60	25.8	1.83	± 0.05
5.2.	Would you like to specialize in physiology in the future?	119	51.1	58	24.9	56	24.0	1.73	± 0.05
5.3.	Do you have enough information about physiology postgraduate education?	140	60.1	71	30.5	22	9.4	1.49	± 0.04

Attitudes and behaviors of the students towards the physiology course compared with gender, GPA, and status of course repetition given in Table 6. It was determined that female students were pay more attention to follow the lesson and understand more in the classroom in order to find interesting the subjects. Besides, GPA of the students who understood the physiology lesson in the classroom were higher than the 60 and they found the lesson interesting and enjoyed studying, and they did not find difficult to learn the physiology. It was observed that those who took the course more than once would not want to attend the course if it was not compulsory and did not find the course interesting. It was also found that these students, like those with a less GPA than 60, thought that the course was based on memorization.

As shown in Table 7, students thought it was appropriate to be given the physiology course in the 2nd-grade, which did not differ according to gender or GPA or status of course repetition. Also, even if all students have noted that physiology is necessary for their future profession, female students agreed with this opinion more than the male, and similarly, the 2nd grade students agreed more than the 5th grade students (P<0.05). Furthermore, the mean scores of

Discussion and Conclusion

Student feedback is a current and reliable method that has been used continuously from past to present in order to improve the education process. However, it is also important to evaluate the data objectively that is obtained from survey (Otağ and Otağ, 2013; Çetkin et al., 2016). In this study, we have determined the opinions and attitudes/behaviors of the Kırıkkale University Faculty of Veterinary Medicine's students to the physiology course, and competence/necessity of the course in terms of profession for them. The data showed that both male and female students have preferred the veterinary faculty willingly (94.4%). It is known that faculty preferences take shape by the individual's wish, interest and ability, and these can affect the happiness, success and efficiency of the students in education process (Sarikaya and Khorshid, 2009). Also, Küçükaslan and Bulut (2019) have reported that most of the students of Dicle University Faculty of Veterinary Medicine have obtained information about their faculty (59.3%) before they listed university preference(76.9%), which indicates that students have preferred the veterinary faculty willingly and consciously. However, in this study, only 10.7% of the students declared that

Table 6. Alteration of the students' attitudes and behaviors towards physiology lesson according to demographic data

	Gender		Grade point average			Status of course repetition	
	Male	**Female**	**<59**	**60-79**	**80<**	**1 time**	**2+ times**
Did you attend the physiology course regularly?	2.53 ± 0.07	2.65 ± 0.06	2.41 ± 0.11	2.63 ± 0.06	2.71 ± 0.11	2.65 ± 0.05	2.45 ± 0.10
Was it necessary to follow the lesson in the class in terms of physiology learning?	2.60 ± 0.07 ^{b}	2.83 ± 0.04 ^{a}	2.63 ± 0.10	2.78 ± 0.04	2.58 ± 0.13	2.74 ± 0.05	2.65 ± 0.08
Would you attend the class even if you did not have to attend?	2.04 ± 0.08 ^{b}	2.36 ± 0.07 ^{a}	1.96 ± 0.12 ^{b}	2.23 ± 0.07 ^{ab}	2.42 ± 0.12 ^{a}	2.29 ± 0.06 ^{a}	1.95 ± 0.11 ^{b}
Did you use the textbook or the internet to study physiology?	2.33 ± 0.08	2.45 ± 0.08	2.28 ± 0.11	2.43 ± 0.07	2.42 ± 0.13	2.38 ± 0.06	2.43 ± 0.10
Did you come out of the physiology lesson with an understanding of the subject?	2.07 ±0.07 ^{b}	2.29 ± 0.07 ^{a}	1.80 ± 0.10 ^{b}	2.29 ± 0.06 ^{a}	2.29 ± 0.12 ^{a}	2.21 ± 0.06	2.09 ± 0.09
Did you find the physiology course interesting and enjoyed studying?	2.09 ±0.08 ^{b}	2.50 ± 0.06 ^{a}	1.87 ± 0.12 ^{c}	2.44 ± 0.06 ^{ab}	2.34 ± 0.13 ^{b}	2.40 ± 0.06 ^{a}	2.00 ± 0.10 ^{b}
Did you have difficulty learning the physiology?	1.78 ± 0.08 ^{a}	1.53 ± 0.07 ^{b}	2.22 ± 0.12 ^{a}	1.52 ± 0.06 ^{bc}	1.37 ± 0.12 ^{c}	1.62 ± 0.07	1.77 ± 0.10
Did you think the physiology is based on the memorization?	2.14 ± 0.08	2.00 ± 0.08	2.33 ± 0.12 ^{a}	2.04 ± 0.07 ^{ab}	1.84 ± 0.13 ^{b}	1.96 ± 0.07 ^{b}	2.35 ± 0.10 ^{a}

Different letters show statistically significances which mean P<0.05.

Table 7. Alteration of the students' opinions on the importance of physiology lesson according to demographic data

	Gender		Grade				Status of course repetition	
	Male	**Female**	**2nd**	**3rd**	**4th**	**5th**	**1 time**	**2+ times**
Was it appropriate to give the physiology course in the 2nd grade?	2.32 ± 0.08	2.51 ± 0.07	2.59 ± 0.07	2.36 ± 0.10	2.22 ± 0.17	2.20 ± 0.17	2.44 ± 0.06	2.34 ± 0.10
Did you think the physiology course necessary for your profession?	2.64 ± 0.07 ^{b}	2.82 ± 0.05 ^{a}	2.87 ± 0.05 ^{a}	2.71 ± 0.07 ^{ab}	2.70 ± 0.13 ^{abc}	2.37 ± 0.16 ^{cd}	2.78 ± 0.05	2.60 ± 0.09
Did you think your physiology knowledge is sufficient?	2.08 ± 0.07	2.05 ± 0.08	2.21 ± 0.08 ^{a}	2.01 ± 0.09 ^{ab}	2.11 ± 0.17 ^{ab}	1.77 ± 0.15 ^{b}	2.15 ± 0.06 ^{a}	1.86 ± 0.10 ^{b}

Different letters show statistically significances which mean P<0.05.

they studied physiology more than 4 hours a week, and the GPA of only 16.3% of them was 80 ≤. Furthermore, consistent with the fact that almost all the students (89.3%) spent 0-4 hours a week studying physiology course, the GPA of 60.5% of them ranged from 60 to 79. This situation may be related with one of the common problems in today's educational process, as previously reported by Tümkaya and Bal (2006), that students do not have effective/sufficient study habits.

In some previous studies (Gözil et al., 2006; Sindel et al., 2008; Çetkin et al., 2016), the students stated that the teaching method of anatomy made the course easier and affected their success. Also, students of faculty of education, who took the course in anatomy and physiology, declared that the course time was sufficient (80%) and they stated that it was important to care visuality in teaching/learning process (87%) (Otağ and Otağ, 2013). Besides, Sefton (2005) considered the future of physiology education in a global sense by emphasizing the necessity of visuality us-

age in the teaching/learning process like the internet and computer actively. In addition, Lewis (2003) reported that the students, who received anatomy and physiology courses by computer-assisted learning methods, took higher marks than those subjected to conventional methods. According to Ekerbicer et al. (2016), faculty of medicine students informed that usage of simulation was effective in the physiology laboratory (mean score = 4.15±1.18). Similarly, in our study, students, who thought the course should be given in the 2nd grade (62.7%) and the hours of the course is sufficient (53%), thought that the visuality was important in the teaching/learning of the physiology course (90.1%) because they thought the teaching method affects their success in the physiology course (72.5%).

The students stating that they did not have difficulty learning physiology (58.4%) thought that it was necessary to follow the lesson in the classroom (81.1%). Even though most of the students (72.5%) attended the lesson, the 47.2% of them declared that they would not attend the class if it were not compulsory. This may indicate that they have attended the lesson unwillingly. But, in this finding, it should be considered that approximately 30% of the students took the physiology course more than twice. Also, 41.1 % of them thought that this course is based on the memorization, which may account for the low percentage (39.9%) of the students coming out of the physiology class with the satisfaction of understanding the subject. According to Razon (2020) people learn the issues of their interest and needing easily and quickly with having fun. Similarly, Brandt (1998) suggested that people learn what is personally meaningful for them. However, only half of the students in this study stated that they were interested in or enjoyed studying physiology. Thus, their interest in the course may affect their attendance at class and success in physiology course.

It is really worrying that most of students in this study plan to continue postgraduate education neither in physiology nor in any department. Our findings are compatible with the results of Küçükaslan and Bulut (2019) in which they reported that only 22.8% of veterinary students wanted to be an academician, and Çetkin et al. (2016) in which they showed that only 6.5% of medical students wanted to continue postgraduate study in basic sciences. In the present study, while ¼ of the students would like to do doctorate in physiology, the number of students who have sufficient knowledge about postgraduate physiology education is very low. It is thought that this situation may be solved by meeting the deficit of existing specialists and academic staff, especially in basic sciences. Therefore, we believe that it is necessary to raise awareness, in the students, of postgraduate veterinary physiology education through activities such as seminars.

As understandable from Table 6, some attitudes and behaviors of students towards the physiology course differed according to gender, GPA and the status of course repetition. Students who are female or have higher GPA or have taken the course one time were more interested and enjoyed in studying physiology, and they have less difficulties learning physiology than the others in terms of the mean scores of responses. They have also stated that they would attend the class even if it were optional. The effect of gender may be related to the fact that women are better than men in verbal memory/ability (Karaçay, 2013) and regular studying habits (Batyra, 2017). Additionally, hardworking students have generally high GPA and can complete the courses successfully at once. On the other hand, the students who had low GPA or taken the course more than once thought that physiology was based on memorization. Students, in some previous studies reported by Michael (2007) and Kunt (2014), have also declared that "physiology" and "anatomy and physiology" courses, respectively, was based on memorization, so they have had difficulties learning them. Therefore, it is clearly understood that it is necessary to employ different educational methods which enable students to learn, by understanding rather than memorization, and enjoy physiology.

According to the 83.7% of the students, the physiology course is necessary for the education of veterinary medicine. Besides, more than half of them declared that theoretical and practical issues satisfied their expectations. On the other hand, the rate of students, who consider their physiology knowledge is sufficient (35.6%) or unsure of their physiology knowledge (35.6%), indicated that students forget what they learned after passing the course. To solve this problem, students may be advised to devote a little more time to study physiology, and instructors may be advised to use new teaching techniques such as "concept maps" (Diwakar et al., 2007) and "case-based or guided practices" (García-Vázquez et al., 2018; McFee et al., 2018) in the education process for knowledge to be permanent.

In conclusion, in this study, it was revealed that most of the students considered the physiology course as one of the basic courses required for veterinary medicine education. Also, they preferred visual education for this course which satisfied the expectations of them and few of them cared about the course that would prefer postgraduate education. Since physiology provides information about homeostatic mechanism, we thought that the students become aware of the course how it is essential for veterinary medicine. Because they realized that disruption of homeostatic balance causes diseases as they take vocational courses. Furthermore, Students' preference for graduate education in physiology can be related with finding the course interesting and enjoyable for the same

reason. Considering that homeostatic mechanisms are protected by the cooperation of many physiological systems, it is also expected that the relations between systems are more understandable when they teach visual techniques and practices. These findings showed that it may be beneficial to add different teaching techniques to veterinary physiology education in order to increase interest in physiology course and to ensure permanent learning so that interest in postgraduate education should be increased.

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