ISSN: 2687–4393

SBED-2024 : 7(1)

Sağlık Bilimlerinde Eğitim Dergisi

DETERMINATION OF KNOWLEDGE ABOUT RATIONAL DRUG USE OF 4TH GRADE DENTISTRY STUDENTS

A. Sencer YURTSEVER*, R. Nalan TİFTİK[1]

Abstract

Purpose: Irrational drug use cause important problems in dentistry such as treatment failure, drug resistance, and an increase in adverse effects. Rational use of medicine (RUM) training in dentistry should be given effectively. Firstly, the knowledge of dentistry students related to RUM should be known. We aimed to determine the knowledge level of dentistry faculty students about RUM.

Method: In this cross-sectional/descriptive study, a 32-question online questionnaire was applied to students in 4th-grade at Mersin University Faculty of Dentistry.

Results: Almost all the students think that patients should be informed about their diseases/their treatments, while 28.6% are undecided regarding prescribing the drugs requested by patients, and 5.7% of them were indecisive about the prescribing to the patient without being examined. Almost all have sufficient knowledge regarding informing the patient about the use of the treatment. Nonetheless, 20% of students are undecided informing the patient about side-effects and possible food/drug interactions with the prescribed medications. Students have sufficient knowledge about the rational drug selection criteria of effectiveness, safety, and suitability. However, their knowledge about the importance of treatment costs is lower because 28.6% are undecided about taking the drug cost into consideration, and 5.7% stated that it should not be considered. 28.6% of the students are undecided about prescribing drugs, considering the purchasing power of the patients. Our findings show that dentistry students have sufficient knowledge about RUM. However, the importance of informing patients about the drugs and considering the cost of treatment should be emphasized more in the RUM training.

Keywords: Rational Use Of Medicine, Rational Drug Use Education, Dentistry Student

DİŞ HEKİMLİĞİ 4. SINIF ÖĞRENCİLERİNİN AKILCI İLAÇ KULLANIMI HAKKINDAKİ BİLGİLERİNİN BELİRLENMESİ

Öz

Amaç: Akılcı olmayan ilaç kullanımı diş hekimliğinde tedavi başarısızlığı, ilaç direnci ve yan etkilerin artması gibi önemli sorunlara neden olmaktadır. Çözüm için diş hekimliğinde akılcı ilaç kullanımı (AİK) eğitimi etkin bir şekilde verilmelidir. Öncelikle diş hekimliği öğrencilerinin AİK ile ilgili bilgi düzeylerinin bilinmesi gerekmektedir. Diş hekimliği fakültesi öğrencilerinin AİK ile ilgili bilgilerinin belirlenmesini amaçladık.

Yöntem: Kesitsel/tanımlayıcı tipte olan bu çalışmada Mersin Üniversitesi Diş Hekimliği Fakültesi 4. sınıfta öğrenim gören öğrencilere 32 soruluk online anket uygulanmıştır.

[1] A.Sencer YURTSEVER, Mersin Üniversitesi, Mersin, Türkiye, drasencer@gmail.com, https://orcid.org/0000-0002-6690-119X

R. Nalan TİFTİK, Mersin Üniversitesi, Mersin, Türkiye, nalantiftik@yahoo.com, https://orcid.org/0000-0001-7277-3369

Bulgular: Öğrencilerin tamamına yakını, hastaların hastalıkları ve tedavileri hakkında bilgilendirilmesi gerektiğini düşünürken, %28,6'sı hastanın istediği ilaçları reçete etme konusunda, %5,7'si ise hastaya muayene etmeden reçete yazma konusunda kararsız kalmaktadır. Tamamına yakını tedavi hakkında hastayı bilgilendirme konusunda yeterli bilgiye sahiptir. Bununla birlikte öğrencilerin %20'si reçete edilen ilaçların yan etkileri ve olası gıda/ilaç etkileşimleri hakkında hastayı bilgilendirmek konusunda kararsızdır. Öğrenciler, rasyonel ilaç seçim kriterleri olan etkinlik, güvenlik ve uygunluk hakkında yeterli bilgiye sahiptir. Ancak ilaç maliyetini dikkate alma konusunda kararsız olanların %28,6'sı ve dikkate alınmaması gerektiğini belirtenlerin oranı ise %5,7 olduğundan tedavi maliyetlerinin önemine ilişkin bilgileri daha düşüktür. Hastaların satın alım gücünü göz önüne alarak reçete yazılması konusunda öğrencilerin %28,6'sı kararsızdır.

Bulgularımız diş hekimliği öğrencilerinin AİK hakkında yeterli bilgiye sahip olduklarını göstermektedir. Ancak hastaların ilaçlar hakkında bilgilendirilmesinin ve tedavi maliyetinin göz önünde bulundurulmasının önemi AİK eğitiminde daha fazla vurgulanmalıdır.

Anahtar Kelimeler: Akılcı ilaç kullanımı, akılcı ilaç kullanımı eğitimi, diş hekimliği öğrencisi

Geliş Tarihi: 11/11/2024 Kabul Tarihi: 28/11/2024

INTRODUCTION

World Health Organization (WHO) defined the RUM (Rational use of medicine) as the use of drugs suitable for the clinical needs of patients for the prevention, diagnosis, and treatment of diseases at the lowest cost. RUM, which is an important approach to the health of individuals and the welfare of society, could not become widespread enough despite the training. In addition to the difficulties caused by irrational approaches in terms of medical practices, it causes unnecessary and exaggerated diagnostic costs of patients' diseases, leading to use of the limited budget allocated to health far from effective, especially in developing countries. Besides, treatment resistance constitutes an important public health problem globally due to the rise in the frequency of drug-related adverse effects and the increase in treatment-related morbidity and mortality rates. Global healthcare spending reached $7.8 trillion in 2017. Every year spending on health increases faster than the gross domestic product of countries. The rate of increase of spending on health care between the years 2000-2017 (7.8% annually) is more than the crude domestic product's growth rate in particular developing countries, including Turkey (6.3% annually). One of the most important items in health expenditures is the money spent on pharmaceuticals. The size of the global pharmaceutical market was $1.2 trillion in 2018. Turkey ranks 17th worldwide in terms of market size. The money paid for pharmaceuticals in Turkey was 13.4 billion TL in 2000 and reached 40.7 billion TL in 2019. Parallel to this, while 1.62 billion boxes of medicine were sold in 2000, this number reached 2.37 billion boxes in 2019 (2). According to WHO's calculations, more than 50% of all drugs were prescribed, distributed, and sold inappropriately globally (1, 3). Similarly, in approximately 50% of the prescriptions in Turkey, medicines are incompatible with the diagnoses or comprise drugs that are not indicated for use (4).

The most common types of IRUM are considered by WHO as practices such as polypharmacy, prescribing drugs that do not comply with clinical guidelines, prescribing antibiotics in inappropriate doses or in non-bacterial infections (5). IRUM is of great importance, especially when evaluated in terms of antibiotics. The use of irrational antibiotics is perhaps the most crucial reason for the resistance of microorganisms to antibiotics. When evaluated in terms of antibiotic consumption between the years 2010-2018, Turkey is taking first place among OECD (Organisation for Economic Co-Operation and Development / Ekonomik İş Birliği ve Kalkınma Örgütü) countries (6). This value, which is almost twice the drug consumption of other countries, suggests that the use of inappropriate antibiotics in Turkey is serious. It was found that 39% of the prescriptions comprise antibiotics and 42% contain non-steroidal anti-inflammatory drugs (4). The importance of the approach of the physicians to RUM will be understood when the findings considered in conjunction with being Turkey's non-steroidal anti-inflammatory drug consumption 7th among the 36 OECD countries (6). In a study on dentists, it was found that 82% of the prescriptions contain antibiotics. The results of the study showed that dentists prefer spiramycin as the second most prescribed antibiotic, although there is little evidence regarding the effectiveness in the treatment of dental infections. Besides, it has been found that metronidazole, which has strong effectiveness in the treatment of dental infections, is not in the top 10 drugs according to the frequency of prescriptions, and clindamycin is also preferred with a very low percentage. Moreover, it was seen that 34.7% of the prescriptions comprise antibiotics, although there was no diagnosis related to infection (7). Considering these findings, it can be said that effective training on RUM of the physicians and dentists is one of the critical points in preventing the IRUM, which is seen to be of significant size in Turkey. To provide adequate education for dentists, primarily it is necessary to determine the knowledge level of dentistry students about RUM. There is no study on the determination of the level of knowledge about the use of rational drug dental students in Turkey. Therefore, we aimed to determine the knowledge of the dental school students regarding RUM.

METHOD

This cross-sectional and descriptive study was conducted between 25.01.2021-25.02.3021 via Google forms application. The universe of the study consisted of all students (n=35) studying in the 4th-grade of Mersin University Faculty of Dentistry. Students received RUM training as part of their pharmacology course in the 4th year of their education. Ethical approval was obtained from the Mersin University clinical research ethics Committee (01/06/2021-01/32). The students were informed

regarding the aims of the study. Informed consent of the students was obtained. In the study, it was aimed to reach the entire population using no sample selection method. The questionnaire comprising 32 closed-ended questions prepared through the Google forms application was sent to the students via e-mail; after the students had answered online, the collected forms were analyzed. All students who attended the medical pharmacology course with content related to RUM, who attended the Mersin University Faculty of Dentistry Term 4 and accepted to fill in the questionnaire online, were included in the study. All the participants (35 students) answered the questions in the questionnaire in a way that gives one answer to each question (response rate 100%). The questionnaire with 32 questions in total consists of four parts. In the first part, there were questions about the participants informing the patient and their relatives about their illnesses and their treatment. The second part was aimed to determine participants' knowledge regarding questioning the information about the patient. The questions in the third part were prepared to evaluate the students' knowledge level regarding informing the patient about drug therapy. In the fourth part, there were questions prepared to evaluate the knowledge level of the students about the rational drug selection criteria. The answers to the questions have been arranged to be one option of "yes", "no", "indecisive" and each question was given a single answer. All the questions were answered by all the participants. Descriptive statistics were used to evaluate the data.

FINDINGS

12 of the students participating in the study were female (34.3%), 23 of them were male (65.7%). The average age of the participants was 22.43±0.19. Considering the answers about the knowledge level regarding informing the patient about the disease and its treatment, it was seen that all the participants thought that the patient should be informed about the disease and its causes. Consistent with this, they stated that the reason for the need for treatment and the information about the prescribed drugs should be conveyed. Besides, all students think that the complications that may arise due to the patient's illness should be told. However, 2 students (5.7%) stated that they were hesitant about dentists' ability to prescribe medication without examining patients. 10 (28.6%) of the students stated that they were unsure about prescribing the drugs that the patient requested to be prescribed. The number of students who answered no to this question is 25 (71.4%) (Table 1).

Table 1: Questions for Measuring the Level of Knowledge Regarding Informing the Patient About the Disease and Its Treatment.

Survey Questions	Yes	No	Indecisive
The dentist should tell the patient about the illness and its causes.	35 (100%)		
The patient should be informed why treatment is required.	35 (100%)		
Dentists can prescribe medication without examining patients.		33 (94.3%)	2 (5.7%)
If the patient has requested medications, they can be prescribed.		25 (71.4%)	10 (28.6%)
The dentist should give the patient information about the medications that have been prescribed	35 (100%)		
Whether the patient understands the information regarding the treatment that has been given should be checked.	31 (88.6%)		4 (11.4%)
Treatments other than drugs may also be recommended to patients.	33 (94.3%)	1 (2.9%)	1 (2.9%)
It is necessary to evaluate the results of all treatments with or without medication.	34 (97.1%)	1 (2.9%)	
It is necessary to tell the patient the complications that may arise due to the disease.	35 (100%)		
How and in what way the disease might respond to treatment should be explained.	34 (97.1%)	1 (2.9%)	

When the answers about the questioning of the patient's information were evaluated, it was seen that all the students thought the drugs used before and chronic diseases of the patient should be questioned. Besides, all students think that the age of the patient should be considered, and liver-kidney disease should be questioned when prescribing medication. However, the number of students who consider the gender of the patient to be taken into account when prescribing medication is 28 (80%). Three (8.6) of

the students answered that gender is not required to be considered when prescribing drugs, and four students (11.4%) stated that were undecided about this issue. However, it was observed that all the students stated that the pregnancy status of the patient should be questioned while prescribing medication, and almost all of them (34 students, 97.1%) thought that breastfeeding status should be questioned (Table 2).

Table 2: Questions for Measuring the Level of Knowledge Regarding Questioning the Patient's Information

Survey Questions	Yes	No	Indecisive
When prescribing drugs, the dentist should ask about the medications the patient used.	35 (100%)		
When prescribing medication, the dentist should ask whether the patient has a chronic illness.	35 (100%)		
When prescribing medication, it is necessary to take into account the age of the patient.	35 (100%)		
The dentist should ask if the patient to whom the drug will be prescribed has liver and kidney disease.	35 (100%)		
The gender of the patient for whom the drug will be prescribed should be taken into account.	28 (80%)	3 (8.6%)	4 (11.4%)
The dentist should ask whether the patient to be prescribed is pregnant or not.	35 (100%)		
The dentist should ask whether the patient to be prescribed is breastfeeding or not.	34 (97.1%)	1 (2.9%)	

When the answers about informing the patient about drug therapy were evaluated, it was seen that all the students thought that the patient should be informed about the use of drugs and the duration of the treatment. On the other hand, one of the students (2.9%) expressed a negative opinion. In comparison, 4 students (11.4%) were undecided about telling the patient in which pharmaceutical form of the drug will be administered. The number of students who said that the patient should be told about the side effects that may be seen due to the drug was 28 (80%), while were undecided on this issue was 7 (20%).In parallel with this, 20% of the students (7 people) are undecided about telling the patient about other drugs or food interactions of the drugs prescribed to the patient, while 80% (28) thought that it should be said.26 people (74.3%) thought that the dentist should tell the patient the name of the prescribed medicine, while 7 students (20%) were undecided about this issue (Table 3).

Table 3: Questions to Measure the Level of Knowledge About Informing the Patient About Drug Therapy

Survey Questions	Yes	No	Indecisive
Patients should be informed how to use the drugs.	35(100%)		
It has to be said how long the treatment should take.	35(100%)		
The dentist should tell the patient in what dosage the drugs will be used.	34 (97.1%)	1 (2.9%)	
The pharmaceutical form in which the drugs will be administered should be told to the patient.	30 (85.7%)	1 (2.9%)	4 (11.4%)
The side effects that may be seen due to drugs should be told to the patient.	28 (80%)		7 (20%)
The dentist should tell the patient the name of the medicine that has been prescribed.	26 (74.3%)	4 (11.4%)	5 (14.3 %)
The patient should be told what the effect of the drug is.	32 (91.4%)	1 (2.9%)	2 (5.7%)
The dentist should tell the patient if the prescribed medicine has interactions with other drugs or foods.	28 (80%)		7 (20%)

When the answers about the rational drug selection criteria were evaluated, it was seen that all students thought that the efficacy and safety profile of the drug should be considered in drug selection. On the other hand, 23 students (65.7%) thought that the price of the drug should be considered in the selection of the drug, while 10 students (28.6%) were undecided. Besides, 2 students (5.7%) thought negatively. Consistent with this, 68.6% of the participants (24 students) thought that the purchasing power of the patients should be taken into consideration while prescribing drugs. In comparison, 28.6% (10 students) were undecided on this issue, and 2.9% (1 student) thought negatively.

Interestingly, the rate of students who think that the presentations made by the representatives of the pharmaceutical industry may affect their drug selection decision was 14.3% (5 students). While 37.1% of the students (13 students) were undecided about this issue, 48.6% (17 students) stated that they would not be affected (Table 4).

Table 4: Questions to Measure the Level of Knowledge About the Rational Drug Selection Criteria

Survey Questions	Yes	No	Indecisive
When choosing drugs, dentists should take into account the effectiveness of the medicine.	35 (100%)		
When choosing drugs, dentists should take into account the price of the medicine.	23 (65.7%)	2 (5.7%)	10 (28.6%)
When choosing drugs, dentists should consider the safety profile of the medication.	35 (100%)		
Dentists should pay attention to the suitability of the medicine when choosing a drug.	34 (97.1%)	1 (2.9%)	
The dentist should have information about the prices of the medicines that have been prescribed.	33 (94.3%)	1(2.9%)	1 (2.9%)
Medication should be prescribed to patients, taking into account their purchasing power.	24 (68.6%)	1 (2.9%)	10 (28.6%)
Presentations of employees who advertise medicines affect the decision of dentists in drug selection.	5 (14.3%)	17 (48.6%)	13 (37.1%)

DISCUSSION AND INTERPRETATION

The concept of RUM, which is expressed as the ability to obtain the most appropriate drug according to the individual characteristics and clinical findings of the patients, at the most appropriate doses and at the appropriate time, at the lowest cost to themselves and the society, was first introduced in 1985 at a conference organized by the WHO (8). Drug use that does not comply with the content of this definition is defined as IRUM (1, 5). IRUM is an important health problem globally. However, its negative effects on the limited budget allocated to health in developing countries and less developed countries are felt more clearly. Antibiotic resistance costs 4-5 billion dollars a year only in the United States. This additional expense is calculated to reach 35 billion dollars annually in labor loss and others, together with the indirect losses. (5, 9, 10). According to the estimates made by the Centers for Disease Control and Prevention, every year, 2 million people in the USA get infections caused by microorganisms with developed antibiotic resistance, and at least 23 thousand people die due to these infections (9). Most crucial factor leading to the development of antibiotic resistance is the frequent use of antibiotics, even in cases where they are not necessary. It is estimated that at least 50% of antibiotics are prescribed even though they are unnecessary or in insufficient doses. According to a study conducted in India, 37% of dentists believe that antibiotics are effective against viral infections (11).

In addition, and perhaps more importantly, IRUM poses a significant risk to the health of the patient by causing a decrease in treatment efficacy, an increase in the frequency of drug-related adverse effects, and the incidence of treatment-related morbidity and mortality. Deaths due to adverse drug effects rank 4th among the major causes of death in the USA after cancer, heart diseases, and stroke. According to the results of a meta-analysis study in which 39 out of 153 clinical studies conducted between 1966-1996 were evaluated, it is calculated that approximately 106,000 of the individuals hospitalized each year die because of adverse drug effects (12). It has been estimated that deaths due to medical errors in the USA in 2000 are between 44.000-98,000 per year. Approximately 7000 of these deaths have been reported to be due to adverse drug effects (13). It has been shown that there is a correlation between the incidence and severity of fatal adverse reactions and polypharmacy (13, 14). Especially in older people with more than one chronic disease, drugs prescribed by different physicians for their conditions stand out among the causes of polypharmacy. In a study, it was observed that 65% of older people used one or more drugs that were not suitable for diseases, and 57% were using drugs that were ineffective, not indicated, or had the same effect as another drug used (14). More strikingly, in a study in Sweden examining the prescriptions written to 511.843 individuals over

65 years of age who died between 2007 and 2013 during the 12 months before they died, it was found that more than 10 drugs were prescribed for 30-47.2% of these individuals (15). Similar results have been obtained in studies on elderly individuals in Turkey (16, 17). In the light of these findings, it is seen that it is crucial to question the drugs they used before while giving treatment to patients. In our study, all participants stated that they would question the patient's age, chronic disease, and previous medications while prescribing medication. Similarly, all participants stated that they would question special situations such as pregnancy and breastfeeding in female patients. When evaluated in this respect, it is seen that the rational use of medicine training given during dental education is effective.

RUM is defined as "the whole of the principles of using the right medicine in the right amount, with the right application, with the right timing, with sufficient information and taking into account the cost-effectiveness" (18). Considering this definition, it is seen that informing the patient by the physician is one of the important factors among the principles of RUM. Treatment compliance of the patients who are adequately informed about the disease and its treatment by the physician will increase, the probability of terminating the treatment with insufficient dose or time will decrease, and the awareness level regarding the adverse effects that may occur will be higher. As a result of all these, both IRUM will decrease, and adverse effects that may occur will be noticed in a timely manner, and precautions will be taken. For this reason, emphasizing the importance of informing the patient during the RUM training to be given to physicians and dentists throughout their education will contribute to the increase of the effectiveness of the education.

When the answers about informing the patient about the disease and treatment are evaluated, it is seen that all the participants think that the patient should be told about the disease and its causes. All participants think that the reason for the treatment should be explained, information should be given about the prescribed medications, and the complications that may occur due to their disease should be informed. In a study conducted with dentists, it was determined that 83.8% gave information to the patient about the drug they had prescribed, while 16.2% stated that they did not give information (19). In a recent study, it was stated that 75% of dentists informed the patient (20). When the results of our study are evaluated together with the results of these studies, it is seen that the knowledge and awareness level of dentistry 3rd-grade students about informing the patient is quite high. It can be thought that the reason for this difference is that the in-service vocational trainings are not provided at a sufficient level during the continuation of the dentistry profession, or the dentists do not participate in these trainings at an adequate level. Indeed, a study found that 55% of dentists did not receive any training on RUM (21). This finding seems to explain the high level of knowledge of the participants in our study compared to actively working dentists.

In the questionnaire, it was observed that 80% of the students answered positively to the question about the interaction of the prescribed drugs with other drugs or foods, while 20% were undecided. When these answers are evaluated, it is seen that the knowledge level of most of the students about the need to inform the patient is very good. However, the fact that the rate of those who said they were indecisive reached the level of 20% indicates that the importance of informing patients about the interaction of drugs prescribed for them with other drugs or foods should be emphasized while training on RUM. The interaction of drugs with other drugs or foods poses a risk in terms of the emergence of adverse effects, especially in elderly people with a high rate of multiple drug use. For this reason, it seems necessary to review the education given about RUM during the education of students in this respect. Similarly, 80% of the students thought that the side effects that may be seen due to the drug should be told to the patient, while 20% stated that they were undecided about this issue. Informing the patients about the prescribed medication for them is important for developing RUM behavior. When the answers given to these two questions are evaluated together, it is seen that the RUM training given during dentistry education should be supported to highlight patient information.

When the questions about effectiveness, suitability, and safety among the RUM criteria were evaluated, it was seen that all the participants stated that the effectiveness, safety, and suitability of the drug should be taken into account when choosing drugs. This situation shows that RUM education has a positive effect on students' levels of knowledge. However, evaluating the answers given to the questions aiming to reveal the effect of treatment cost on drug choice revealed an important point:

28.6% of the participants stated they were undecided about considering the purchasing power of the patient while prescribing. Consistent with this, 28.6% of the students declared they were undecided about the drug price in drug selection, and 5.7% stated it was unnecessary to take the drug price into consideration. When these responses are evaluated together, it is thought it should be emphasized the cost of treatment should be taken into consideration while training on RUM. A crucial parameter that should be considered together with efficacy, suitability, and safety in the drug's selection to be prescribed is the treatment cost. This concept, which can be summarized as providing treatment with the least cost to the patient and society, is an essential pillar of RUM. Money paid for medicine constitutes a significant part of health expenditures, especially in underdeveloped and developing countries. It is calculated that this rate reaches up to 60% (22, 23). This finding shows how important it is to emphasize the necessity of considering the cost of the drug in RUM education.

When evaluated the answers given whether the presentations of the medical sales representatives influence the decision of the participants in drug selection, it was seen that 37.1% were undecided and 14.3% thought that they were affected. The rate of those who said they were not affected was 48.6%.It is perceived that the number of participants who can consider the presentations of pharmaceutical industry employees, which can contain biased information about the drug they promote, as a source of information is high. This situation seems to have a negative effect on the attitude toward RUM. However, in a study conducted on physicians, it was demonstrated that 78.9% of family physicians and 74.3% of specialist physicians considered the presentations of medical sales representatives (20). When evaluated together with the results of this study, it is concluded that the RUM education given during the period of dentistry education has a positive effect on the choice of the source related to drug selection. However, the importance of resource selection in determining drug preferences in education should be emphasized.

The students participating in our study received training on RUM in the "Pharmacological Approaches in Dentistry" course in the 4th year of dentistry education. In the light of the results of this study, it was seen that RUM education in general significantly increased the knowledge level of the students. However, it was seen that this training should be given more effectively by emphasizing the points such as informing the patient, considering the cost of treatment and the patient's purchasing power, as well as other criteria in drug selection. Nonetheless, our study has some limitations. All 4^{th}-grade students of the faculty of dentistry selected as the universe of the study were reached, and all of them answered the questionnaire. However, because the class contains 35 students, the result of this study is far from adequately demonstrating the level of knowledge of dental students all in Turkey about the rational use of drugs. Nonetheless, it is important because it is the first study regarding the knowledge level of dentistry students about RUM in Turkey. Furthermore, it is as well significant in terms of showing the knowledge level of the students who were educated about RUM during the education period.

Dentists, like physicians, are in a central position in RUM. Including the training of RUM in dental practice in the formal education curriculum of the faculties of dentistry will make a significant contribution to the reduction of IRUM in Turkey.

CONCLUSIONS AND RECOMMENDATIONS:

Results of the study show that dentistry students possess sufficient knowledge about RUM. However, the importance of informing patients related to drugs and considering the cost of treatment should be highlighted more in the RUM training.

ACKNOWLEDGEMENTS:

This study was not supported by any institution or organization.

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