

## ***The Knowledge and Attitude of Nursing Students Towards Rational Drug use***

### ***Sağlık Yüksek Okulu Hemşirelik Öğrencilerinin Akılcı İlaç Kullanımına Yönelik Bilgi ve Tutumlarının Değerlendirilmesi***

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**Abstract:** Because nurses play an important role in rational drug use (RDU), education should begin in the school. We aimed to determine the knowledge and attitudes of nursing students about RDU. This descriptive study was carried out on 1590 nursing students. A total of 961 (60.44 %) students filled out a questionnaire form. Of the students, 68.80 % were from University A and 30.90% were at Class III. The students had well knowledge about the administration route but had moderate knowledge about the indication, duration of effect, adverse effects, contraindications, drug interactions and precautions about the drug use. Of the students, 79.4 % have reported the adverse effects with 57.9 % reporting the adverse effects to a nurse. It was determined that 80.50% of the students get no/inadequate education about RDU at the school. Nursing students have moderate knowledge about RDU and get inadequate education about RDU at school.

**Key Words:** nurse, education, rational drug use, university, student

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**Özet:** Akılcı ilaç kullanımında hemşireler oldukça önemli bir rol oynamaktadır. Hemşirelerin akılcı ilaç kullanımı konusundaki eğitimleri okulda başlamalıdır. Biz bu çalışmada hemşirelik öğrencilerinin akılcı ilaç kullanımı ile ilgili bilgi ve tutumlarını değerlendirmeyi amaçladık. Bu tanımlayıcı çalışma 1590 adet hemşirelik öğrencisi üzerinde yürütülmüştür. Toplam 961(%60.44) öğrenci anket formunu doldurmuştur. Öğrencilerin % 68.8' A Üniversitesi'nden ve %30.90'I ise 3. Sınıfı. Öğrenciler ilaç uygulama yolları ile ilgili iyi derecede bilgiye sahipti ancak ilaçların endikasyonları, etki süresi, advers etkileri, kontrendikasyonları, ilaç etkileşimleri, ve kullanım yerleri ile ilgili sınırlı bilgiye sahip oldukları görüldü. Öğrencilerin %79.4 ünün advers etki bildirimini yapmış, bunların % 57.9 u advers etki bildirimini bir hemşireye yapmış olduğu görüldü. Öğrencilerin % 80.50 sinin okulda akılcı ilaç kullanımı konusunda eğitim almadıkları ya da yetersiz eğitim aldıkları tespit edilmiştir. Hemşirelik öğrencileri AİK konusunda ortalama bir bilgiye sahiptir fakat okulda aldıkları eğitim yetersizdir.

**Anahtar Kelimeler:** hemşire, eğitim, akılcı ilaç kullanımı, üniversite, öğrenci

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## 1. Introduction

Rational drug use (RDU) has been defined by World Health Organization as “the set of rules that patients receive medications appropriate to their clinical needs, in doses that meet their own individual requirements, for an adequate period of time, and at the lowest cost to them and their community (1). Medicines are important products that should require the proper management of this process from its production to the disposal of waste. Because nurses are the members of a profession group in close and sustained relation with the patients, they bear great responsibilities particularly in terms of therapeutic applications.

Patient safety includes a complete set of measures taken by the healthcare organizations and healthcare professionals in order to avoid the damage to persons resulting from healthcare services (2). Patient safety is a very important issue in the healthcare services provided by nurses. According to the regulation of nursing services, “Nurses are responsible for providing a safe environment to the individual, family, group and community health while doing their professional competence and responsibilities. (3). Nurses are responsible to satisfy the nursing responsibilities in accordance with the related laws and regulations with providing the healthcare services in an independent, semi-dependent or dependent manner (4,5). Drug administration is among the responsibilities of nurses and is a multidisciplinary process which begins with the physical examination of the patient and ends with the administration of drug. The key role of nurses in this process cannot be discussed. It has been reported in previous studies that the most common type of error affecting the patient safety is drug administration error (5). Although drug-associated errors may be related with the physician, nurse and/or patient, usually nurse is considered to be responsible because drug-associated errors are most commonly seen during the administration of drug (6). Drug-associated errors and damage will be minimized with the nurses having knowledge about the pharmacology and being able to

decide quickly about the measures and necessary interventions and to take on the responsibility. (5). Drugs being necessary for the protection, recovery and maintenance of health may induce many problems when used with no rational drug use principles. Health professionals who do not follow the drug-related developments and have inadequate knowledge about pharmacology may be at high-risk to make administration errors. Nurses with adequate training on RDU may have a key role in generalizing the RDU principles. (7). Therefore, it would be an important step on this topic to examine the behavior about RDU and to change the erroneous knowledge and attitudes in nursing students who will become a member of healthcare team in the future.

For this purpose, this study was planned to evaluate the knowledge and attitudes about RDU in nursing students from two universities from Central Anatolia and to determine if there will be a behavioral change in RDU with advancing classes.

## 2. Material and Method

This cross-sectional descriptive study was carried out with the nursing students from two universities located in Central Anatolia. Data were collected by using the questionnaire form pre-prepared by the researchers after a literature search (8,9,10,11). Questionnaire form consists of 23 items about age, class, gender, high-school graduation, medication errors, knowledge level about medications, adverse effects and reporting, and storage and disposal of medications.

After informing the students about the purpose of the study, verbal consent was obtained from the students before giving the questionnaire form. Students not willing to participate in the study and unavailable at the time of study were excluded. Questionnaire forms were filled out by face-to-face interview method. Study was carried out on a total of 1590 students from the nursing school of two universities. Of these, 961 students (60.44%) were included in the study. The current study was approved by Ethical

Committee for Clinical Research (Application Number: 2016-05/01) and supported by Ahi Evran University Research Fund (Project Number: PYO TIP A3.16.00)

number and mean±standard deviation. P<0.05 was considered as significant.

## 2. 3. Results

### *Statistical analysis*

Data were evaluated by using SPSS 17.00 statistical package program. Chi-square test was used for the statistical analysis and descriptive data were expressed as percentage,

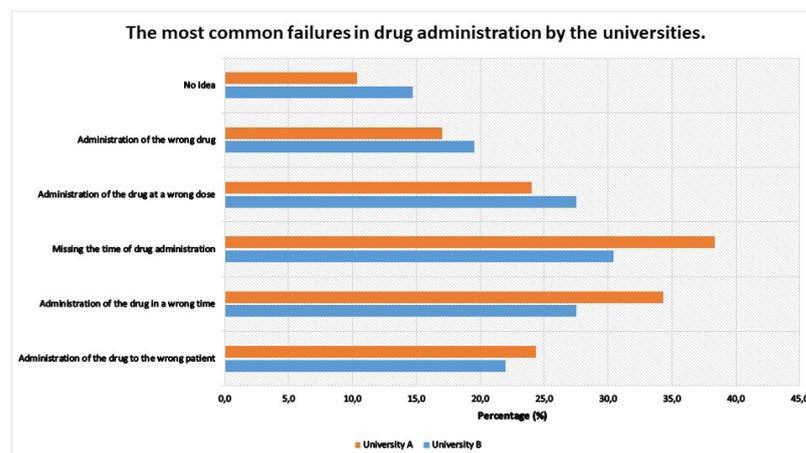
Of the students, 3.80% were female with a mean age of 20.71±1.56 years. Of these students, 14.00% were graduated from vocational school of health and 55.90% reported that they have previously done internship in inpatient services (Table 1).

**Table 1.**  
Identifying information for the students participating in the study (n=961)

|  | Number<br>(n) | Percentage<br>(%) |
|--|---------------|-------------------|
| <b>Health Professional in the family</b> |               |                   |
| Yes                                      | 152           | 15.80             |
| No                                       | 809           | 84.20             |
| <b>Relatives</b>                         |               |                   |
| Parents                                  | 17            | 1.70              |
| Siblings                                 | 43            | 4.50              |
| Other                                    | 92            | 10.00             |
| None                                     | 809           | 83.80             |
| <b>Occupation</b>                        |               |                   |
| Physician                                | 29            | 3.00              |
| Nurse                                    | 71            | 7.50              |
| Health staff/technician                  | 30            | 3.10              |
| Other                                    | 16            | 2.20              |
| None                                     | 809           | 84.20             |
| <b>Internship</b>                        |               |                   |
| Inpatient clinic                         | 537           | 55.90             |
| Outpatient clinic                        | 47            | 4.90              |
| Emergency room                           | 21            | 2.20              |
| Intensive care unit                      | 10            | 1.00              |
| All units                                | 270           | 28.10             |
| Nowhere                                  | 76            | 7.90              |
| <b>Summer Internship</b>                 |               |                   |
| Inpatient clinic                         | 186           | 19.40             |
| Outpatient clinic                        | 21            | 2.20              |
| Emergency room                           | 16            | 1.60              |
| Intensive care unit                      | 29            | 3.00              |
| All units                                | 149           | 15.50             |
| Nowhere                                  | 560           | 58.3              |

The most commonly drug administration errors reported by the students were missing the drug administration time (32.9%), drug administration at a wrong time (29.7%) and drug administration to a wrong patient

(22.7%) (Figure 1). Students were found to have a high level of knowledge about the administration routes of the drugs but a moderate level of knowledge about other parameters (Table 2).



**Figure 1:** The most common failures in drug administration by the universities

**Table 2.**

What do you think about your knowledge level you have about the drugs you are using (n=961)

|   | Very good | Good | Moderate | Poor | Very poor |
|---|-----------|------|----------|------|-----------|
| <b>Intended use</b>                                     | 9.7       | 37.6 | 44.5     | 7.1  | 1.1       |
| <b>Administration route</b>                             | 15.2      | 48.4 | 29.9     | 5.4  | 1.1       |
| <b>Duration of effect</b>                               | 4.7       | 24.8 | 51.3     | 17.2 | 2.1       |
| <b>Adverse effects</b>                                  | 3.1       | 16.4 | 50.6     | 25.6 | 4.3       |
| <b>Contraindication</b>                                 | 3.2       | 17.0 | 50.2     | 25.5 | 4.2       |
| <b>Drug interaction(drug/use)</b>                       | 3.6       | 18.2 | 44.5     | 27.2 | 6.5       |
| <b>Warning, precaution</b>                              | 5.9       | 25.5 | 48.2     | 17.8 | 2.6       |
| <b>Special circumstances (pregnancy, children etc.)</b> | 7.2       | 24.1 | 42.8     | 21.3 | 4.6       |

Of the students, 69.1% stated that they have asked the patient about drug and/or food allergy before the drug administration. On the

other hand, 64.1% of the students stated that patient should be informed about the drug they are using (Table 3).

**Table 3.**  
The attitudes of students about RDU by the two universities

| Attitudes   | University |      |     |      | X <sup>2</sup> | p     |
|---|------------|------|-----|------|----------------|-------|
|   | A          |      | B   |      |                |       |
|   | n          | %    | n   | %    |                |       |
| <b>Do You ask the patient about drug and/or food allergy before the drug administration</b> |            |      |     |      |                |       |
| Always; I think it is a vital situation   | 457        | 69,1 | 208 | 69,3 |                |       |
| I only ask about the drug allergy   | 102        | 15,4 | 41  | 13,7 |                |       |
| No; I consider that the physician have asked about it                                       | 49         | 7,4  | 26  | 8,7  |                |       |
| No; he/she already says if he/she have  | 15         | 2,3  | 11  | 3,7  |                |       |
| No; I don't think that there is a significant problem                                       | 13         | 2    | 1   | 0,3  | 6,275          | 0,280 |
| Currently, I don't administer any medication  | 25         | 3,8  | 13  | 4,3  |                |       |
| <b>Do you inform the patient about the drug he/she is using ?</b>                           |            |      |     |      |                |       |
| Yes; Patient should be informed about the drugs they are using                              | 424        | 64,1 | 211 | 70,3 |                |       |
| I will only give information if the physician asks for or refers to me                      | 93         | 14,1 | 26  | 8,7  |                |       |
| I will only give information if the patient asks for  | 70         | 10,6 | 36  | 12,0 |                |       |
| No; it is not my responsibility to give information about the drugs                         | 16         | 2,4  | 5   | 1,7  |                |       |
| No; I have no time  | 12         | 1,8  | 6   | 2,0  | 7,852          | 0,165 |
| I can not give information about this issue because I have no informatio                    | 46         | 7    | 16  | 5,3  |                |       |

As seen in Table 4, 53.5% and 42.4% of the students from University A and University B had no idea about what will be done to the unused drugs. There was a significant difference in the information about what will be done to the unused drugs between the two universities (p=0.001) (Table 4).

In terms of storage conditions of the drugs, majority of the students from two universities

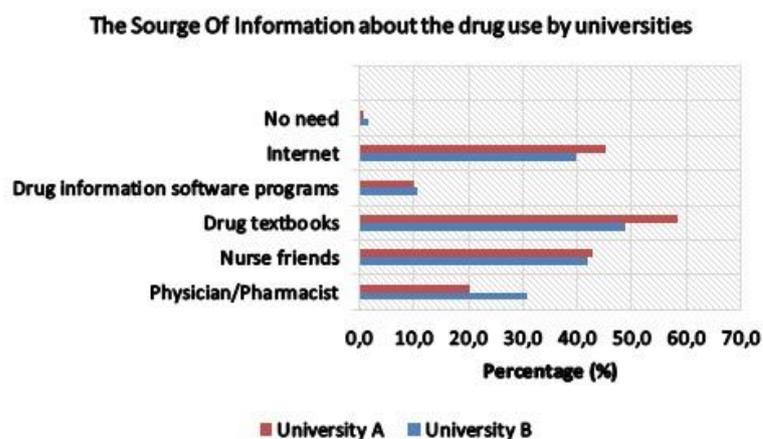
were in agreement that drugs are stored according to recommended storage conditions. Of the participants, 51.6% from University A and 48.3% from University B stated that expiration date of the drugs is monitored. There was a significant difference between two universities in the knowledge level about this issue (p=0.03) (Table 4).

**Table 4.**  
The knowledge level of the students from two universities about the storage, monitorization of expiry date and disposal of drugs

| Attitudes  | University |      |     |      | X <sup>2</sup> | p       |
|--|------------|------|-----|------|----------------|---------|
|  | A          |      | B   |      |                |         |
|  | n          | %    | n   | %    |                |         |
| <b>What will be done to the unused drugs by various reason?</b>          |            |      |     |      |                |         |
| Delivering the pharmacy.   | 121        | 18,3 | 94  | 31,3 |                |         |
| Stored to be used for other patient.                                     | 134        | 20,3 | 67  | 22,3 |                |         |
| Gathering to be destroyed.   | 52         | 7,9  | 12  | 4,0  | 25,913         | 0,001** |
| No idea  | 354        | 53,5 | 126 | 42,4 |                |         |
| <b>Does hiding drugs in accordance with the storage condition?</b>       |            |      |     |      |                |         |
| Yes and all employess act conscious about it.                            | 320        | 48,4 | 146 | 48,7 |                |         |
| Attention is paid only to drugs with special storage conditions.         | 224        | 33,9 | 114 | 38,0 |                |         |
| No, no appropriate environment   | 27         | 4,1  | 10  | 3,3  | 3,458          | 0,326   |
| No idea  | 90         | 13,6 | 30  | 10,0 |                |         |
| <b>Do you follow the expiry date of drugs is done?</b>                   |            |      |     |      |                |         |
| Yes, everytime.  | 341        | 51,6 | 145 | 48,3 |                |         |
| Sometimes; Expiry date of drugs unit on the basis of drugs is listed on. | 148        | 22,4 | 93  | 31,0 |                |         |
| No; I think that is delivered to service controlled way                  | 52         | 7,9  | 19  | 6,3  | 8,965          | 0,03*   |
| No idea  | 120        | 18,2 | 43  | 14,3 |                |         |

(\*)= p<0.05, (\*\*)=p<0,001

The information about drug administration has been reported to be obtained commonly from nurse friends (42.2%), textbooks (51.8%) and internet search (41.6%) (Figure 2).



**Figure 2:** The source of information about the drug use by universities

In the questions related to report of adverse effect, approximately 79.4% of nurse candidates receiving education in the universities of A and B indicated that they report unexpected adverse effect (side-effect), 57.5% of them do not make a report and 79.4% of them indicated that they report to responsible doctor or nurse (Table 5). When the students were asked a question of “Do you know the sanctions on the reporting of adverse effect do you think ? ”, a close-ratio of 77 % was given an answer “No”. When it was

asked that the sanctions related to adverse effects were imposed or not, 80.3% of students in university B thought that they were not imposed and 72.8% of students in university A thought that they were not imposed too. Any statistically significant difference can not be detected between the students in universities A and B in terms of their knowledge and attitude about this issue (p=0.012) (Table 5). In this question, a significant difference was found between both of the universities (p=0,012)(Table 5).

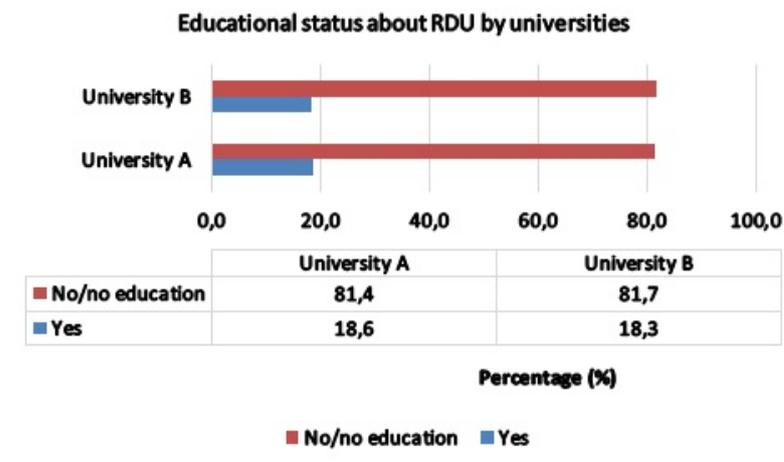
**Table 5.**

The Student participated in the study of adverse (side) effect evaluation of the impact statement according to university level.

| Attitudes  | University |      |     |      | X <sup>2</sup> | p      |
|--|------------|------|-----|------|----------------|--------|
|  | A          |      | B   |      |                |        |
|  | n          | %    | n   | %    |                |        |
| <b>Do you report of adverse effect/ Should you do?</b>                               |            |      |     |      |                |        |
| Yes  | 531        | 80,3 | 234 | 78,0 | 0,692          | 0,406  |
| No   | 130        | 19,7 | 66  | 22,0 |                |        |
| <b>How many did you ever report?</b>   |            |      |     |      |                |        |
| 1-5  | 265        | 40,1 | 68  | 35,7 |                |        |
| More than 6  | 27         | 4,1  | 15  | 5,0  | 1,885          | 0,390  |
| I never report.  | 369        | 55,8 | 178 | 59,3 |                |        |
| <b>To whom did/do you report this kind of reports?</b>                               |            |      |     |      |                |        |
| Responsible Physician/charge nurse   | 520        | 78,7 | 243 | 81,0 |                |        |
| Pharmacovigilance unit of the hospital   | 49         | 7,4  | 30  | 10,0 | 5,852          | 0,054  |
| Other  | 92         | 13,9 | 27  | 9,0  |                |        |
| <b>Do you know the sanctions on the reporting of medication errors do you think?</b> |            |      |     |      |                |        |
| Yes  | 149        | 22,5 | 71  | 23,7 |                |        |
| No   | 512        | 77,5 | 229 | 76,3 | 0,148          | 0,700  |
| <b>Are these sanctions applied in the field?</b>                                     |            |      |     |      |                |        |
| Yes  | 180        | 27,2 | 59  | 19,7 |                |        |
| No   | 481        | 72,8 | 241 | 80,3 | 6,32           | 0,012* |

On the other hand, when the question was “Is the education program in nursing adequate in terms of rational drug use (RDU)?”, 81.4%

and 81.7% of the students from A and B universities reported as being “inadequate” ( Figure 3).



**Figure 3:** Educational status about RDU by universities

In this study, it was also investigated that if there is any difference about knowledge and attitude towards rational use of drugs between the 2nd grade and the 4th grade of the university. However there was not statistically difference between the classes.

#### 4. Discussion

Because nursing profession requires constant communication with the patient, nurses have an important role in monitoring the effect of drugs and treatment response of the patient. As a part of their profession, nurses should read and interpret the medicine prescribed by the physician, should administer the medicine properly and inform the physician in case of any problem (12). In order to achieve all of these, nurses should have adequate pharmacological knowledge. Drug administration is one of the high risk areas for errors in nursing profession which may compromise the safety of patient (13,14).

The role of health professionals in Rational Drug Use is a multidisciplinary process that begins with the choice of physician about the drug that will be used on the patient. Because of administering the drug to the patients, nurse is the last partner in the meeting of the drug with patient. Adequate pharmacological knowledge of a nurse not only prevent the drug administration errors related to her/himself but also allows to recognize the

errors not related her/himself, allowing the early intervention for these errors (13).

Previous studies from Turkey revealed that knowledge level of nurses about RDU is very low. There is no standard for nursing as well as other health professions education programs between the educational institutes. Limitations of resources also constitute a major problem. The content of the pharmacology lessons are usually far from being instructive for nursing and other health professions students in their future working life. Therefore, it would be unfair to expect these individuals to behave in accordance with the RDU principles. In order to gain the adequate knowledge, RDU concept should be learned with the valid educational methods on the basis of basic pharmacology knowledge (11,13,15). In the present study, we evaluated the knowledge level and attitudes of nursing students from all classes studying at the health colleges of two universities in Central Anatolia region about the RDU concept. Data obtained from the study suggest that nursing students largely participated in the study (60.44%). They stated that the most common drug administration errors they have observed during their internship are administration of the drug at a wrong time (29.7%) missing the drug dose (32.9%) and administration of the drug to the wrong patient (23,1%) (Figure 1). In their study, Saygili et al. (16) and Oguz et al. (14) have also reported similar results.

Furthermore, other previous studies have also found similar errors among nurses (17).

Their knowledge level about the drugs they are administering to the patient was reported to be good for administration route and moderate for other parameters (Table 2). The parameters they have a moderate knowledge were the indication, duration of effect, adverse effects, contraindications and drug interactions, all of which are the theoretical pharmacological information. In the study by Saygili et al. (16), nurses were found to have very good or good knowledge about the administration route of the drugs and indications but to have a moderate or poor knowledge about other parameters. The major difference of the present study from that study is that Saygili et al (16) did not include students in their study. Accordingly, Demirtas et al (17) have also reported similar results. It is of important that our and above-mentioned two similar studies found unsatisfactory findings for the parameters about drugs that require pharmacological knowledge, which is same for both nurses in their working life and nursing students studying at two different universities. Therefore, it can be suggested that pharmacology lessons are inadequate in nursing school from past to today. In-service training provided to the already working nurses about commonly used drugs and RDU may overcome this problem. However, this problem existing in nursing students can be eliminated by introducing pharmacology and RDU lessons into the curriculum of the nursing education.

Of the students, 69.1% reported that they have asked the patient about food and/or drug allergy before administering the drug (Table 3). Because food and/or drug allergies can result in serious adverse effects, this parameter is important in terms of RDU. Thus, investigation of the allergies may prevent these unwanted outcomes.

Of the nursing students filled out the questionnaire form, 64.1% from University A and 70.3% from University B stated that patient should be informed about the drug that will be used (Table 3) which includes the dose, duration of usage and administration

route. As seen, nursing students are aware of the fact that patient should be informed about the drug that will be used. Previous studies have found that working nurses also agree that patient should be informed about drugs and give information (14, 18). However, it should be kept in mind that giving information requires adequate knowledge about that topic. It will be an important gain for nurses and nursing students in terms of RDU to give information to the patient about the drug that will be used and to be aware of the necessity of informing the patient.

The question of “what will be done to the unused drugs?” was answered as “no idea” by 47.9% of the students in total from two universities (Table 4). Interestingly, the percentage of students answering as “no idea” was significantly higher in University A compared to University B ( $p=0.001$ ). the management of drug waste is an important process for RDU. Nurses should have knowledge adequate to manage the process of drug disposal (12). The difference found between two universities may be related to the educational differences from the universities. Also, the participants were nursing students and had no professional experience.

Majority of the students from two universities stated that drugs are stored in accordance with their storage conditions (Table 4). On the other hand, nearly half of the students stated that expiry date of the drugs is monitored (Table 4). It is among the duties of nurses working in inpatient services to store the drugs according to the storing conditions and to monitor the expiry date of drugs. With considering the fact that all students participating in the present study had no professional experience out of the internship, these results are promising. Similar previous studies have also reported similar results (16,17).

In the present study, information about drug administration was obtained commonly from nurse friends (42.2%), textbooks (51.8%) and internet search (41.6%) (Figure 2). In the study of Saygili et al (16) on working nurses, of course, the most common source of information was physicians and pharmacists,

followed by textbooks and nurse peers. Although not being carried out on nursing students, the study by Oguz et al (14) also found similar results to ours. In that study, majority of nurses (84%) stated the source of information to be the textbooks. In another study by Sahingoz et al (18), nurses were found to obtain the information mostly from guidelines or package inserts. It is a desired outcome to obtain the drug-related information from textbooks. Using the textbooks is a correct behavior for nursing students in terms of both accessing the most correct information and RDU.

It was found that 79.4% of the students reported the adverse effects, but nearly 80% reported this adverse effect to the charge physician and/or nurse (Table 5). It is obvious that a limited number of students from both universities were aware of that adverse effects should be reported to pharmacovigilance center. Report of adverse effects is an important topic in terms of RDU (19). Hanafi et al (20) have carried out a questionnaire-based study about the appropriate reporting of adverse effects among nurses working in hospitals. The rate of correct answers was 61.3% in the first questionnaire which was increased up to 100% in the second questionnaire administered after an education program. That study was valuable with revealing the lack of knowledge among nurses about the adverse effects and to whom and how these adverse effects will be reported. Accordingly, Oguz et al (14) have found that 58% of the nurses never reported an adverse effect. All these studies were carried out on working nurses. However, to our knowledge, no similar study was carried out on nursing students previously. Results of the present study suggest that majority of the nursing students were aware of that adverse effects should be reported, but they did not know to

whom they will report, suggesting the inadequacy of RDU education in nursing schools. On the other hand, about 78% of the students from both universities were found to have no information about the sanctions related to the report of adverse effects (Table 5). The question of "Are these sanctions applied in the field?" was answered as "no" by 72.8% and 80.3% of the students from universities A and B, respectively (Table 5). The answers given to the questions related to adverse effects suggest that nursing students from both universities have inadequate pharmacovigilance knowledge. Thus, it will be suggested that pharmacovigilance should be included in the undergraduate nursing education programs.

In total, more than 81% of the students stated that the information given about RDU is inadequate in nursing education (Figure 3). The similarity of this high rate between two independent universities reveals the inadequacy of RDU in the undergraduate nursing education programs.

## 5. Conclusion

Present questionnaire-based study evaluated the knowledge level and attitudes about RDU in two universities giving undergraduate nursing education. Results of the study suggest that the education programs are inadequate in terms of RDU but nursing students are aware about the importance of this issue. Thus, it can be suggested that RDU should be included in the education program of nursing schools and in-service training should be provided to the working nurses. With considering the fact that nurses are the major partner in RDU, accurate and timely education will prevent non-rational drug use greatly and will be beneficial in constituting an adequate awareness about RDU.

## KAYNAKLAR

1. World Health Organization (1985) The Rational Use of Drugs. Report of the Conference of Experts. Geneva: WHO.
2. Hemşirelik Hizmetleri Yönetmeliği Resmi gazete. Ankara : Resmi Gazete. 2010; 27515.
3. Aştı T, Acaroğlu R (). Hemşirelikte sık karşılaşılan hatalı uygulamalar. C.Ü. Hemşirelik Yüksekokulu Dergisi,2000;4(2);22-27.  
<http://eskidergi.cumhuriyet.edu.tr/makale/571.pdf>
4. Aygin, D., Cengiz, H. Drug administration errors and the responsibility of a nurse. The Medical Bulletin of Şişli Etfal Hospital, 2011;45(3); 110-114.
5. Uzun, Ş., Aslan, F. Medication errors. Türkiye Klinikleri J Med Sci , 2008;28(2); 217-222.
6. Ulupınar S, Akıcı A. Rational use of medicine in nursing practise. Türkiye Klinikleri J Pharmacol-Special Topics, 2015;3(1): 84-93.
7. Çırpı F., Merih Y D., Kocabay M.Y. Nursing Practices That Are Aims To Patient Safe And Determining The Nurses Point View Of This Topic. Maltepe Üniversitesi Hemşirelik Bilim ve Sanatı Dergisi , 2009; 2: 26-34.
8. Saygılı M, Özer Ö, Uğurluoğlu Ö. An evaluation on levels of knowledge and behavior of nurse about rational drug use in a public hospital. Dokuz Eylül Üniversitesi Hemşirelik Fakültesi Elektronik Dergisi, 2015;8: 3  
<http://www.deuhyoedergi.org/index.php/DEUHYOED/article/view/110>
9. Çelik S, Alacadağ M, Erduran Y, Erduran F, Berberkayar N. The investigation of antibiotic use situations health school student's. Journal Of Human Science,2010; 7:1.
10. Turkey Drug and Medical Devices Agency. <http://akilciilac.gov.tr>
11. Uzuntarla Y. The analysis of relationship between nurses' rational use of drugs and their personal characteristics. TAF Preventive Medicine Bulletin, 2016;15(1): 1-8.
12. Akıcı A, Ulupınar S. Hemşire ve diğer sağlık çalışanları için akılcı ilaç kullanımı. ÇSGB, SGK Yayın No: 2013;104, Ankara.
13. Ünver V, Başak T, Yüksel Ç, Güvenç G, Ayhan H, Köse G, Aslan A, İyigün E, Taştan S, Konukbay D. The effectiveness of the rational use of medication "4th year grade course in scope of patient safety. Dokuz Eylül Üniversitesi Hemşirelik Fakültesi Elektronik Dergisi 2014; 7: 285-290.
14. Oğuz E, Alaşehirli B, Demiryürek AT. Evaluation of the attitudes of the nurses related of the rational drug use in Gaziantep University Sahinbey Research and Practice Hospital in Turkey. Nurse Education Today, 2015;35; 365-401.
15. Page K, Mckinney A. Addressing medication errors — the role of undergraduate nurse education. Nurse Educ.Today, 2007;27; 219–24.
16. Saygılı M, Özer Ö, Uğurluoğlu Ö. An evaluation on levels of knowledge and behavior of nurse about rational drug use in a public hospital. Dokuz Eylül Üniversitesi Hemşirelik Fakültesi Elektronik Dergisi, 2015;8: 3  
<http://www.deuhyoedergi.org/index.php/DEUHYOED/article/view/110>
17. Demirtaş E, Soylu M, Soylu M, Ödevci N. Akılcı ilaç uygulamalarında sağlık çalışanlarının farkındalık düzeyleri (uygulamalı bir örneği Yeşilyurt Hasan Çalık Devlet Hastanesi). IV. Uluslararası Sağlıkta Performans ve Kalite Kongresi (Sözel Bildiriler Kitabı). 1. Cilt, Ankara 02-04 Mayıs 2013, 2015;553-570.
18. Şahingöz M, Balcı E. Rational drug use of nurses. TAF Preventive Medicine Bulletin, 2015;12 (1); 57-64.
19. Edwards IR, Aronson JK (2000). Adverse drug reactions: definitions, diagnosis, and management. Lancet, 2000;356:1255–9.
20. Hanafi S, Torkamandi H, Hayatshahi A, Gholami K, Shahmirzadi NA, and Javadi MR. An educational intervention to improve nurses' knowledge, attitude, and practice toward reporting of adverse drug reactions. Iran J Nurs Midwifery Res, 2014;19(1): 101–106.