Annals of Medical Research
DOI: 10.5455/annalsmedres.2018.12.299 2019;26(4):570-5

Original Article

# Non-prescription drug use in a group of medical students: For success

Rukiye Nalan Tiftik[1], Oya Ogenler[2], Ismail Un[1]

[1]Mersin University, Faculty of Medicine Department of Medical Pharmacology, Mersin, Turkey
[2]Mersin University, Faculty of Medicine Department of Medical History and Ethics , Mersin, Turkey

Copyright © 2019 by authors and Annals of Medical Resarch Publishing Inc.

**Abstract**

**Aim:** Non-prescription drug use is a common problem in the population and also among medical students. Medical education requires great efforts and students may prefer to use non-prescribed drugs during examination periods in order to facilitate the studying lesson.

**Material and Methods:** In the present study non-prescribed drug use among a sample of Mersin University Medical Faculty students was investigated. The study was carried out with 145 respondents in the third year of education. Data were expressed as frequency and mean ± standard deviation, for group comparisons chi-square test was used. $p<0.05$ was considered significant.

**Results:** 85 (58.6%) of the students use non-prescribed drugs. 39 (27%) of the students were using analgesic drugs and 14 (35%) of the students stated that they use psychostimulants directly specifying the trade name of the drugs. Although the majority of the students (66.9%) did not specify where they learned the drug name most of them respond as they learned from their friends (12.4%). Seventy (48.2 %) of the students don't use any drug or herbal product for reducing fatigue because of they will harm their body.

**Conclusion:** The prevalence of non-prescription drug use is quite high and common among medical students. Precautions should be taken to prevent students from using the non-prescription drugs especially psychostimulants.

**Keywords:** Medical students; Non-prescription drug use; Psychostimulants.

## INTRODUCTION

Pharmacology is one of the crucial courses for all medical school students. This course includes teaching basic methods for the treatment of human diseases and usage of drugs. Also, the course emphasizes the importance of using medicines under a physician's control and according to medical indications. (1,2)

Medical education requires great efforts and in order to be successful, generally, students have to force their limits (3). In order to increase their performances, students may prefer to use non-prescription medicines, especially psychostimulant drugs (4,5).

Psychostimulants are sympathomimetic drugs that can be easily transmitted to the central nervous system. Phenylethylamine derivative of amphetamine and active dextro isomer dextroamphetamine, methamphetamine and methylphenidate are drugs with similar pharmacological properties that potentiate the dopaminergic transmission in the cortical, limbic and striatal areas. These drugs potentiate the noradrenergic transmission in the limbic system and noradrenergic pathways. Psychostimulant drugs have some effects such as psychic excitation, euphoria, reducing fatigue and sleep, increasing concentration, initiative and self-confidence. While they increase the functions of memory and learning, also increase the ability of mental calculation, attention, vigilance and physical performance and reduce the need for sleep. As a result, due to the aforementioned reasons, these drugs are often abused on the other hand, many side effects of these agents, especially in acute poisoning, severe excitation and sympathomimetic effects may occur. These drugs are written on a special prescription in Turkey (6-8).

Therefore, the usage of such drugs with serious side effects in terms of educational success is an important point that is needed to be focused on. Medical students use such drugs under the influence of social prejudices

**Received:** 25.12.2018 **Accepted:** 21.01.2019 **Available online:** 24.01.2019
**Corresponding Author:** Rukiye Nalan Tiftik, Mersin University, Faculty of Medicine Department of Medical Pharmacology, Mersin, Turkey, **E-mail:** nalantiftik@yahoo.com

and personal preferences need to be focused on (9). They should give attention to human health and ought to act in accordance with medical principles.

The aim of this study is to determine the opinion of students on using drugs with or without a prescription for success. Also, some sociodemographic factors that might be related to this tendency of students were investigated.

## MATERIAL and METHODS

This study was approved by the Mersin University Clinical Research Ethics Committee and carried in the third year of medical school. Participation in the survey was on a voluntary basis. For this reason, 145 of total 260 students agreed to answer the questionnaire. The questionnaire was given to the participants in 2018 after a prior piloting. Data were collected before the medical pharmacology course in the first month of the third year of education. The questionnaire used to collect data consists of two sections containing totally 22 questions and statements. The first section consists of questions and statements related to age, gender, inhabited city before starting university. Also in this section in order to determine how successful they feel, they were asked to assess themselves by giving points out of 10. The second part is about questions and statements on the case of non-prescription drug use. Data were expressed as frequency and mean ± standard deviation, for group comparisons chi-square test was used. $p<0.05$ was considered statistically significant.

## RESULTS

52.4% of the students who participated in the study were male and the average age was 21.30 ± 1.51. 65.5% of their family was residing in the city center. Students have expressed their school success as 6.21 ± 1.56 over 10 points. There is no difference between students' achievement in terms of gender [male (6.08±1.65), female (6.36±1.48)] (p=0.922) (Table 1).

Eighty-five (58.6%) of the students declared that they use drugs without a prescription for medical indications and other purposes. Non prescribed drug usage was similar among the female [43 (50.6%)] and male [40 (47.06%)]. 48 (33.1%) are using non-prescribed drugs for medical indication and 39 (27%) of the students are using analgesic drugs. Fifty-five (64.7%) of the students who use non prescribed medicine are living in cities. There is no relationship between the use of non-prescribed medication and the place of family residence (Table 2 and Table 3). Fourteen (9.7%) of the students are using drugs in examination periods/days of intensive study to stay awake. 57.1% of the students using the drug are females and 71.4% of these students' family is living in the city center. It is a normal natural behavior for 68 (46.9%) of respondents to use herbal product/drug for reducing fatigue and staying fit. There is no relationship between the gender and the statements 1, 2, 3 and 4 (Table 2). Forty (27.6%) students stated the name of the drug or product that they use in order to facilitate the study during the exam, 22 (55%) of them are females (Table 4).

**Table 1. Demographic data of students (Students only answered questions they want)**

| Gender | The Average of Success Expression | Age Mean ±SD | The Place of Family Residence | | | | Total |
|---|---|---|---|---|---|---|---|
| | | | City (%) | Country (%) | Village (%) | Foreign country n (%) | |
| Female | 6.36±1.48 | 20.94±0.96 | 48 (71.6) | 15 (22.4) | 4 (6) | 0 | 76 (46.2) |
| Male | 6.08±1.65 | 21.62 ±1.82 | 47 (61.6) | 19 (25) | 9 (11.8) | 1 (1.3) | 67 (52.4) |
| Total | 6.21±1.56 | 21.30 ± 1.51 | 95 (65.5) | 35 (24.1) | 14 (9.7) | 1 (0.7) | 145 |

**Table 2. Distribution of the data about the expressions of non-prescription drug use (Students only answered questions they want)**

| | Success | | | Gender | | |
|---|---|---|---|---|---|---|
| | N | Mean | P | Female | Male | Not specified |
| **Statement 1: Have you used drugs without a prescription?** | | | | | | |
| Yes | 85 | 6.36 | | 43 | 40 | 2 |
| No | 58 | 6.00 | p=0350 | 32 | 26 | 0 |
| Not specified | 2 | 6.50 | | 1 | 1 | 0 |
| **Statement 2: Have you use drugs in examination periods/days of intensive study to stay awake?** | | | | | | |
| Yes | 14 | 6.36 | | 6 | 8 | 0 |
| No | 129 | 6.21 | p=0.000 | 69 | 58 | 2 |
| Not specified | 2 | 6.00 | | 1 | 1 | 0 |
| **Statement 3: Do you think herbal product or drug use that reducing fatigue and allow to be more fit is a normal natural behavior?** | | | | | | |
| Yes | 68 | 6.04 | P=0.983 | 33 | 33 | 2 |
| No | 75 | 6.37 | | 42 | 33 | 0 |
| Not specified | 2 | 7.00 | | 1 | 1 | 0 |
| **Statement 4: Do you use the herbal product or drug reducing fatigue and allow to be more fit?** | | | | | | |
| Yes | 29 | 6.07 | P=0.493 | 14 | 15 | 0 |
| No | 110 | 6.24 | | 61 | 48 | 1 |
| Not specified | 6 | 6.50 | | 1 | 4 | 1 |

**Table 3. The type of the drug or product and the causes of using medication without a prescription (Students only answered questions they want)**

| The type of the drug or product (n=57)* | The causes of using medication (n=58)* | | | |
|---|---|---|---|---|
| | Medical indications | Enhancement of attention | Non-medical | Not specified |
| Combination of Multivitamin, Minerals & Ginseng G115 | 1 | 0 | 0 | 0 |
| Morphine | 0 | 0 | 1 | 0 |
| Analgesic & Drugs for Common Cold | 1 | 0 | 1 | 0 |
| Antacid & Antibiotic | 0 | 0 | 0 | 1 |
| Analgesic & Antibiotic | 1 | 0 | 0 | 0 |
| Keratolytic | 1 | 0 | 0 | 0 |
| Drugs for Common Cold | 6 | 0 | 2 | 0 |
| Drugs for Common Cold & Antibiotic | 0 | 0 | 1 | 0 |
| Analgesic | 21 | 0 | 0 | 11 |
| Antibiotic | 1 | 0 | 1 | 0 |
| Analgesic & Proton pump inhibitor | 0 | 0 | 1 | 0 |
| Antidepressant & Analgesic | 1 | 0 | 0 | 1 |
| Psychostimulant | 0 | 1 | 0 | 1 |
| Do not know the drug name | 0 | 0 | 1 | 0 |
| Not specified | 15 | 0 | 0 | 72 |

**Table 4. The type of the drug or product that students stated to use in order to facilitate the study during the exam (Students only answered questions they want)**

| The type of the drug or product Medicine | Female | | | | Male | | | | Total |
|---|---|---|---|---|---|---|---|---|---|
| | City | Country | Village | Foreign Country | City | Country | Village | Foreign country | |
| Psychostimulant | 5 | 3 | 0 | 0 | 5 | 1 | 0 | 0 | 14 |
| Pasiflora extract | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| Combination of Multivitamin, Minerals & Ginseng G115 | 1 | 1 | 0 | 0 | 1 | 1 | 1 | 0 | 5 |
| Zemzem water | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| Vitamin B12 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| Tea | 1 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 3 |
| Combination of Multivitamin, Minerals & Ginseng G115 and other multivitamins | 1 | 0 | 0 | 0 | 2 | 1 | 0 | 0 | 4 |
| Coffee | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| Multivitamin | 1 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 5 |
| Coffee and vitamin | 2 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 3 |
| Not specified | 30 | 14 | 9 | 1 | 35 | 11 | 3 | 0 | 105 |
| Do not know the drug name | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |

The average achievement of students stated the name of the drug or product is 6.23 ± 1.70 while students' who does not write a drug name is 6.21±1.51. There is no significant difference between the two groups (p=0.677) (Table 4).

Fourteen (35%) of the students stated that they use psychostimulants directly specifying the trade name of the drugs. The average achievement of these students is 6.14±2.07 (Table 4). 48 (33.1%) student answered the question of "where did you learn drug" (Table 5) 58 (40%) student answered the question of "where did you buy the drug from"; 9 (15.5%) of these students are supplying the drugs except pharmacies. 56 (38.6%) student answered the question of "are you experiencing side effects of the drugs"; 19 (33.9%) of the students are experiencing side effects of the drugs. 11 (7.6%) students said "yes" to "Are the drugs you use subject to a special prescription?". 24

(16.6%) student said that the drugs are prescribed by a doctor before. 70 (48.2%) student answered the statement of "I don't use herbal product or drug for reducing fatigue because they will harm my body". 54 (77.1%) of these students agreed with this statement. 62 (42.8%) student answered the statement "drug use is contrary to morality and religion". 33 (53.2%) of these students disagreed with this statement (Table 6).

There is a relationship between the use of drugs by the students and the negative statements about the financial situation (p=0.004), the failure to provide (p=0.003), the harm to the body (p=0.000) and the moral contradiction (p =0.001). There is no significant difference between genders about using drugs p>0.05.

**Table 5. The distribution of the answer of the question "Where did you learn the drug from?"**

| | n | % |
|---|---|---|
| **Family** | 9 | 6.2 |
| **Internet** | 8 | 5.5 |
| **School** | 1 | 0.7 |
| **Friend** | 18 | 12.4 |
| **Internet & Friend** | 1 | 0.7 |
| **Research assistants** | 5 | 3.4 |
| **In the lesson** | 1 | 0.7 |
| **In the lesson & Friend & Internet** | 1 | 0.7 |
| **From the doctor** | 1 | 0.7 |
| **Newspaper** | 3 | 2.1 |
| **Not specified** | 97 | 66.9 |
| **Total** | 145 | 100 |

**Table 6. Distribution of data on answers to medication statements (Students only answered questions they want)**

| Statements | Answers | The Average of Success | Gender | | |
|---|---|---|---|---|---|
| | | Mean | Male | Female | Not specified |
| | | | n | n | n |
| **Where did you buy the drug from?** | Pharmacy | 5.98 | 29 | 20 | 0 |
| | Except pharmacy | 6.56 | 7 | 2 | 0 |
| | Not specified | 6.32 | 40 | 45 | 2 |
| **Are you experiencing side effects of the drugs?** | Yes | 6.32 | 15 | 4 | 0 |
| | No | 6.11 | 19 | 18 | 0 |
| | Not specified | 6.24 | 42 | 45 | 2 |
| **Do you feel worse and guilty for using drugs out of physician's recommendation?** | Yes | 5.75 | 7 | 1 | 0 |
| | No | 6.35 | 26 | 19 | 0 |
| | Not specified | 6.20 | 43 | 47 | 2 |
| **Are the drugs you use subject to a special prescription?** | Yes | 5.36 | 8 | 3 | 0 |
| | No | 6.25 | 25 | 20 | 0 |
| | Not specified | 6.31 | 43 | 44 | 2 |
| **Did the drug you used have been prescribed by a physician before?** | Yes | 6.25 | 12 | 12 | 0 |
| | No | 6.00 | 19 | 11 | 0 |
| | Not specified | 6.28 | 45 | 44 | 2 |
| **I don't use herbal product or drug for reducing fatigue cause they will harm my body** | Yes | 6.37 | 32 | 21 | 1 |
| | No | 6.56 | 7 | 9 | 0 |
| | Not specified | 6.04 | 37 | 37 | 1 |
| **I don't use herbal product or drug for reducing fatigue cause it is contrary to morality and religion** | Yes | 6.29 | 11 | 18 | 0 |
| | No | 6.34 | 19 | 13 | 1 |
| | Not specified | 6.5 | 46 | 36 | 1 |

## DISCUSSION

In this study, non-prescription drug use was investigated among a group of medical students in their third year of the faculty. Half of the participants are female and the students' average achievement is 62.

Also half of the participants declared that they use drugs without a prescription and 10% of the students are using drugs in examination periods/days of intensive study to stay awake. Nearly 20% of students use herbal product or drug for reducing fatigue. In this study, factors related to non-prescription drug use were not affected by student's average achievement and gender.

University students are commonly using self-medicated

drugs. Self-medication in fact may lead to problems such as irrational drugs use, increased frequency of adverse effects, side effects and drug interactions. (10,11)

On the other hand, students were asked how they felt about their achievement levels. The mean achievement levels are 62.21 but in fact, it is 62.34. The statements of average achievement level of the students that they felt were similar with overall grade point of average previous years (12). According to the literature higher levels of academic achievement of a medical student are considered as an indicator of adequate professional knowledge/skills (13,14).

In this study, about one-third of the students stated the name of the medicine for increasing the average achievement. There are different studies investigating the relationship between the success of students and the use of drugs or product without a prescription (12,15). Previous studies have reported that academic achievement levels of medical students are affected by intelligence, talent, personality, family characteristics, graduated school, habits, living environment, level of prosperity, basic education, ability to benefit from professional education (16-18).

Medical students who participated in this study have 668 hours of theoretical and 61 hours of practical courses in the third class. In the third class, there are a total of 20 different lectures such as medical pharmacology, medical ethics, medical pathology, nuclear medicine, radiology, medical biochemistry, medical microbiology, surgical and internal medicine. Also, intensive practical professional skill courses are located in the curriculum. Medical training is both longer and intensive than other faculties (19). Medical students have to be in intensely devoted work to be successful (20). Therefore, the probability of drug use of off-label or without a prescription and the requirement of drug usage that increase physical performance and cognitive abilities may increase (4). Due to their central nervous system effects, they can be abused by people who need to stay awake for long periods and to increase cognitive performance (6-8).

It is noteworthy that students rationalize the usage of psychostimulant drugs in order to increase their academic success. About one-third of the students stated that they use psychostimulants directly specifying the trade name of the drugs. 40% of the students who stated drug names said that they have learned this from their friends. However, 70% of the students wrote psychostimulant drug names said they learned from their friends. According to a study basis for using antibiotics without a prescription include advice of a friend/relative (20.2 %) (10).

It has been reported that the success of the students can be affected by the familial properties except for the parent relieving fatigue, effort and willingness (17).

One-third of the students stated the name of the drug or product that they use in order to facilitate the study during the exam, half of them are male. 10% all the students stated that they use psychostimulants directly specifying the trade name of the drugs. Similar to our study it has been reported that psychostimulant drug usage was 15% among medical students (4). Also, most of these students who use non prescribed medicine are living in cities. All of the students who stated the psychostimulant name reported that their families are living in cities and countries. According to this finding, living in the city is thought to be important in terms of the use of psychostimulants.

Although our study did not submit a significant difference between the genders, it has been reported that male students use psychostimulant drugs more than female (4, 21). The psychostimulant drugs used by the students in this study are written on special “red prescription paper” and controlled/monitored by the Ministry of Health in Turkey (22).

The recognition of these drugs by the students who have not get the pharmacology lesson yet, and telling that they have friends using these agents indicates that psychostimulant drugs are popular among medical students. Although the most important limitation of the study is to be conducted on a limited number of medical students, we obtained interesting results. This example represents a group of students in the third year of medical school. Because these responses are only belonging to students who volunteered, in terms of reflecting the reality the data is quite valuable.

Students reported that the majority of drugs (more than 85%) were obtained from the pharmacy. The similar finding is reported for antibiotics' use without a prescription (10).

In this study, non-prescribed drug using is independent of the thought of harming students' body. This situation is not affected by students' religious views or financial situation. In addition, students said that they are not affected by the failure to provide. But on the other hand, eight students said that they feel worse and guilty for using medication without a physician's recommendation.

This study underlines non-prescribed drug use and psychostimulant drug use of the medical students to improve the academic performance and relieve fatigue. Use of psychostimulant drugs or other agents for being successful, improving performance, relieving fatigue besides having deleterious side effects on human physiology also might be a problem of medical education. The situation in question is an important issue to be emphasized in terms of both education and professional skills.

## CONCLUSION

In conclusion; the prevalence of non-prescription drug use is quite high and common among medical students. New studies with larger sample size and studying in all classes of the medical faculty are needed. In addition, some educational programs like workshops, seminars, leaflets should be prepared for non-prescription drug use and also the drawbacks of non-prescribed psychostimulants. In

addition, the prescription of psychostimulants should be further controlled by the health authorities.

*Competing interests: The authors declare that they have no competing interest.*
*Financial Disclosure: There are no financial supports*
*Ethical approval: Mersin University Clinical Research Ethics Committee Approval Received*

*Rukiye Nalan Tiftik ORCID: 0000-0001-7277-3369*
*Oya Ogenler ORCID: 0000-0002-5118-6170*
*Ismail Un ORCID: 0000-0001-6442-4185*

## REFERENCES

1. Rodríguez-Carranza R, Vidrio H, Campos-Sepúlveda E. The teaching of pharmacology in medical schools: current status and future perspectives Gac Med Mex 2008;144:463-72.
2. Kayaalp SO. 2012. Akılcıl Tedavi Yönünden Tıbbi Farmakoloji, Pelikan Yayıncılık, 13.baskı, VI. Bölüm pp 903-17.
3. Elliott DD, May W, Schaff PB, et al. Shaping professionalism in pre-clinical medical students; Professionalism and the practice of medicine. Med Teach 2009:31:e295-302.
4. Webb JR, Valasek MA, North CS. Prevalence of stimulant use in a sample of us medical students. Ann Clin Psychiatry 2013:25:27-32.
5. Carroll BC, McLaughlin TJ, Blake DR. Patterns and knowledge of the nonmedical use of stimulants among college students. Arch Pediatr Adolesc Med 2006:160:481-5.
6. Kayaalp SO. Rasyonel tedavi yönünden tıbbi farmakoloji. Feryal matbaacılık 13. Baskı: 2012;903-917.
7. Brunton LL. eds. The Pharmacological Basis of Therapeutics. Goodman & Gilman's Twelfth edition. 2012. p. 297-300.
8. Dale MM, Ritter J M, Moore PK. Pharmacology. Rang HP eds. Fifth edition. 2003. pp. 585-93.
9. Altıntaş H, Temel F, Benli E, Çınar G, Gelirer Ö,Gün FA, Kernak A, Kundakçı N. Tıp fakültesi birinci sınıf öğrencilerinin madde bağımlılığı ile ilgili bilgi, görüş ve tutumları: Bağımlılık Dergisi. 2004;5:107-14.
10. Civaner M. Uzmanlık eğitiminde tıp etiği. Ann Clin Psychiatry 2013;25:32.
11. Sharif SI, Sharif RS. Antibiotics use with and without a prescription in healthcare students. Am J Pharmacol Sci 2013;5: 96-9.
12. James H, Handu SS, Al Khaja KA,et al. Evaluation of the knowledge, attitude and practice of self-medication among first-year medical students. Med Princ Pract 2006:15:270-5.
13. Ogenler O, Selvi H. Variables affecting medical faculty students' achievement: a Mersin university sample. Iran Red Crescent Med J 2014;16:e14648.
14. Şimşek Cankur N, Ediz B, Sırmalı ŞA. Entegre eğitim sisteminde uygulanan sınavlardaki doğru yanıt seçeneklerinin dağılımı. Uludağ Üniversitesi Tıp Fakültesi Dergisi 2002:28:1-3.
15. Arda B. İş ahlakı açısından tıp: neredeyiz? nereye gidiyoruz? Bilim, Eğitim ve Düşünce Dergisi 2003:3:4.
16. https://www.cdc.gov/healthyyouth/health_and_academics/pdf/alcohol-other-drug.pdf access date 02.12.2018
17. Jung-Sook L, Natasha K. Bowen. Parent involvement, cultural capital, and the achievement gap among elementary school children. Am Edu Res J 2006:43:193-218.
18. Dubow EF, Boxer P, Huesmann LR. Long-term effects of parents' education on children's educational and occupational success: mediation by family interactions, child aggression, and teenage aspirations. Merrill Palmer Q (Wayne State Univ Press). 2009:55:224-49.
19. Keskin G, Sezgin B. Bir grup ergende akademik basarı durumuna etki eden etmenlerin belirlenmesi. Fırat Sağlık Hizmetleri Dergisi 2009:10:3-18.
20. https://www.cdc.gov/healthyyouth/health_and_academics/pdf/alcohol-other-drug.pdf access date 02.12.2018
21. Kusurkar RA, Croiset G, Galindo-Garré F, et al. Motivational profiles of medical students: association with study effort, academic performance and exhaustion. BMC Med Edu 2013;:13:87.
22. Malone S. How Jimmy aced his exam: theoretical explanations for non-medical prescription drug use on college campuses. UW-L J Undergraduate Res 2011;XIV.
23. Kayaalp SO. Türkiye İlaçla tedavi Klavuzu. Pelikan Yayıncılık. 2011.