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Original Article

Prevalence of nonmedical use of Ritalin among medical students of Mashhad University of Medical Sciences

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Abstract

Introduction: This study aimed to determine the prevalence of nonmedical use of Ritalin among medical students of Mashhad University of Medical Sciences.

Materials and Methods: In this cross-sectional study, 607 students of 645 medical students of Mashhad University of Medical Sciences in 2018-2019, selected through random sampling. They fulfilled a researcher-made questionnaire about the attitude toward Ritalin consumption, the validity of which was confirmed by five psychiatrists. Data were analyzed through the descriptive tests, Chi-square test, and SPSS-16 software.

Results: In the present study 607 students (292 men and 315 women) were participated. Sixty-eight (11.2%) of them had a history of nonmedical use of Ritalin. Other commonly used drugs among students were alcohol (7%), cigarettes (11%), and benzodiazepines (5.2%). Also, there was no significant relationship between gender, educational stage, and marital status with nonmedical use of Ritalin among students (P> 0.05).

Conclusion: Based on the results, the nonmedical use of Ritalin is more common among students than alcohol and cigarettes. Also, some students have a positive view of using Ritalin to increase concentration and improve performance in exams. Due to the possibility of severe dependence on this substance, more awareness and preventive measures are needed among students.

Keywords: Medical student, Prevalence, Ritalin

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Introduction

Ritalin, or methylphenidate, is a derivative of amphetamines and a central nervous system stimulant (1). It is chemically similar to cocaine and belongs to the phenethylamine group (2,3). Ritalin exerts its stimulating effect by increasing dopamine release from the granular stores of nerve terminals and inhibiting the reuptake of dopamine (4). It is widely used to treat attention deficit hyperactivity disorder and narcolepsy and is considered one of the most effective treatments for these disorders (5). If this medication is prescribed with the right indication and dose, the probability of pathological dependence on it is less (6). However, many studies have recently shown that the nonmedical use of this medication by students to increase academic performance has increased significantly in recent years (7-9). Nonmedical use of Ritalin can cause strong stimulant effects and serious health risks (10). Its side effects include cardiovascular problems and neurological, digestive, metabolic, and mental disorders (11). Ritalin will lead to dependence and addiction (12).

Medical students go through grueling courses. For this reason, some use Ritalin to tolerate these conditions and increase productivity and success in exams. Students using Ritalin may experience several side effects, such as hallucinations, anxiety, dry mouth, and visual disturbances (9,13). Ritalin withdrawal symptoms include fatigue, sleep disorders, and depression, and its use in high doses can lead to cardiovascular failure or fatal seizures (9).

Habibzadeh et al. assessed the prevalence and information about Ritalin consumption among 310 medical students of Tabriz University of Medical Sciences. Based on the results, participants' knowledge about Ritalin was very low, and 8.7% of the participants had taken Ritalin at least once in the study (8). In another study conducted by Lashkaripour et al. among 561 students of Zahedan University of Medical Sciences about the nonmedical use of methylphenidate, the highest rate of Ritalin consumption was found among residents (35.6%) and people above 30 years (32.5%) and the prevalence of nonmedical use in women was almost two times higher than in men (26.8% vs. 14.1%) (14). Jain et al. conducted a study in 2013 at the Faculty of Medicine, UFS, among 641 medical students. They reported that approximately 11.0% of the students were using methylphenidate at the time of the study. The majority (67.9%) used it for academic purposes, and 70.6% % received it from a physician (9).

Medical students are potentially at risk of nonmedical using of stimulant drugs (such as Ritalin) related to their academic conditions, such as prolonged wakefulness, exams, and stress. They use Ritalin to increase concentration and improve their academic performance (15,16). In Iran, there are no accurate statistics on Ritalin consumption, but because this medication has the effects of increasing concentration, it is misused by students (8,9). Research on the prevalence of Ritalin in Iran has been limited, so it was decided to investigate the prevalence of nonmedical use of Ritalin among medical students of Mashhad University of Medical Sciences, one of the most populated cities in Iran, in 2018-2019.

Materials and Methods

The sample size of this cross-sectional study was determined using the results of a similar study conducted by Habibzadeh et al. (8). They reported a prevalence of nonmedical use of Ritalin 8.7%. Therefore, considering the 10% probability of drop out, the sample size was calculated as 645 people. The participants were medical students of basic sciences, physiopathology, externships, and internships of Mashhad University of Medical Sciences who were selected by random cluster sampling method. The inclusion criteria included being a medical student and not having a history of attention-deficit hyperactivity disorder. The exclusion criteria included unwillingness to fulfilling the questionnaire and unwillingness to continue cooperation during the research. First, the department of medical school education inquired about the number of medical students who were studying basic sciences, physiopathology, internships, and externships. Then, random sampling was done from each level based on the sample size.

Research instrument

A) The Researcher-Made Questionnaire of Students' Attitudes towards Ritalin Consumption: It was designed based on the research by Khademi et al. (17). This questionnaire includes demographic information and eight items related to, which was based on a five-level Likert rating scale (I strongly disagree, I disagree, I have no opinion, I agree, and I strongly agree). The

questionnaire included eight items: 1- Ritalin has serious and dangerous side effects 2. Ritalin should only be prescribed by a psychiatrist 3. There is no harm in taking a small dose of Ritalin to improve performance and increase concentration without a psychiatrist's prescription 4. Ritalin significantly improves performance in various fields (exams, tests, etc.) 5. It is not necessary to be strict in prescribing and selling Ritalin 6. Without using Ritalin, my performance will not be acceptable 7. The side effects of taking Ritalin without a physician's prescription have been magnified and 8. In the case of non-therapeutic use of Ritalin, I can control the cessation of use. Five psychiatrists confirmed the validity of the questionnaire. The reliability of the questionnaire was obtained through Cronbach's alpha (0.73).

Before the COVID-19 pandemic, the questionnaire inside the envelope was given to several participants respectfully. Due to the start of the corona pandemic in 2019, the study was continued with the help of an online questionnaire on the Google form platform. Finally, 607 questionnaires (258 face-to-face and 349 non-face-to-face samples) were collected. Data were analyzed through the descriptive tests, Chi-square test, and SPSS-16 software.

Results

The results showed that among the 607 students (292 men and 315 women) participating, 535 cases were single, and 72 were married. Also, 127 students were in basic sciences courses, 214 in physiopathology, 218 in externships, and 48 in an internship.

Also, the results showed that 68 people (11.2%) had a history of using Ritalin, and 53% of this population (36 people) had daily use. Other commonly used drugs among students were alcohol (7%), cigarettes (11%), and benzodiazepines (5.2 %). Among the users of Ritalin, 36 people (53%) have used Ritalin during their lifetime. Twenty-seven cases (40.3%) had the most frequency of consumption once or twice a day. Thirty-seven students (54.3%) used the lowest dose, and three students (4.5%) used the highest dose (5 tablets or more). Out of a total of 68 students who took Ritalin, 53 (31.1%) stated that the reason for using Ritalin was to calm down before the exam, and 45 (26.4%) stated that the reason for using Ritalin was to decrease sleep (Table 1).

Table 1. The frequency of Ritalin and other substances

Variables		Frequency	Percent
Use of Ritalin tablets	No	539	88.8
	Yes	68	11.2
	Total	607	100.0
	Use of Ritalin in male	39	57.4
	Use of Ritalin in female	29	42.6
	Total	68	100.0
	In lifetime	36	53
	During the last year	21	31
	During the last month	11	16
	Total	68	100.0
	Almost every day	14	20.8
	Once or twice a day	27	40.3
	Exam time	23	34.5
	sometimes	4	4.5
	Total	68	100.0
Ritalin dosage	Less than one tablet daily	37	54.3
	1 to 2 tablets daily	25	36.7
	3 to 4 tablets daily	3	4.5
	5 tablets or more daily	3	4.5
	Total	68	100.0
Use of other substances	Cigarettes	71	11.6
	Alcohol	46	7.5
	Stimulants	4	0.7
	Hashish	21	3.3
	Hallucinogens	7	1.0
	Opioids	12	2.0
	Benzodiazepines	32	5.2
Reason for taking Ritalin	Calm before the exam	53	31.1

	Sexual performance	3	1.8
	Increase energy	33	19.3
	Performance in shifts	3	1.7
	Mood increase	9	5.3
	Increase motivation	18	10.4
	Decreased sleep	45	26.4
	Recreational	5	2.8
	Other	1	0.6
	Total	68	100.0

It was found that 7.7% of the participants had a negative opinion (disagree and very disagree), and 67.2% had a positive opinion (agree and strongly agree) regarding the serious and dangerous side effects of Ritalin. Also, 6.8% had a negative opinion (disagree and very disagree), and 77.3% had a positive opinion (Agree and strongly agree) on prescribing Ritalin only by the psychiatrists. 21.7% had a negative opinion, and 28% had a positive opinion about increased performance using Ritalin in various fields, such as exams (Table 2).

Table 2. The opinion of the participants about the questions of the Ritalin tendency questionnaire

Questions		I strongly disagree	I disagree	No idea	I agree	I agree very much
1. Ritalin has serious and dangerous side effects.	F	10	37	152	266	142
	Percent	1.6	6.1	25.0	43.8	23.4
2. Ritalin should only be prescribed by a psychiatrist.	F	3	38	97	235	234
	Percent	0.5	6.3	16.3	38.7	38.6
3. There is no harm in using a low dose of Ritalin to improve performance and increase concentration without a psychiatrist's prescription.	F	135	196	176	87	13
	Percent	22.2	32.3	29.0	14.3	2.1
4. Ritalin significantly improves performance in various fields (exams, tests, etc.).	F	44	88	305	144	26
	Percent	7.2	14.5	50.2	23.7	4.3
5. It is not necessary to be strict in prescribing and selling Ritalin.	F	175	241	135	40	16
	Percent	28.8	39.7	22.2	6.6	2.6
6. Without using Ritalin, my performance will not be acceptable.	F	310	178	99	14	6
	Percent	51.1	29.3	16.3	2.3	1.0
7. The side effects of taking Ritalin without a physician's prescription have been magnified.	F	79	198	260	58	12
	Percent	13.0	32.6	42.8	9.6	2.0
8. In case of nonmedical use of Ritalin, I have the ability to control the cessation of use.	F	49	70	350	94	44
	Percent	8.1	11.5	57.7	15.5	7.2

Also, there was no significant relationship between gender, educational level, and marital status with Ritalin consumption among students (*P*> 0.05) (Table 3).

Table 3. Relationship between gender, educational level, and marital status with the use of Ritalin

Variables	Chi-Square	Marital status	Gender	Educational level
Use of Ritalin	Pearson Chi-Square	0.59	2.62	5.01
	P	0.44	0.12	0.17

Discussion

This study aimed to determine the prevalence of nonmedical use of Ritalin among medical students of Mashhad University of Medical Sciences. In our study, 11.2% of medical students used Ritalin. Of these, 42.6% were women, and 57.4% were men. This prevalence rate is consistent with the study of Jain et al., who investigated the prevalence of Ritalin among undergraduate medical students at the University of the Free State and reported it as 11% (18). In another study by Fallah et al., on medical students and residents of Babol University of Medical Sciences, 11% of the participants used Ritalin, which this study also is consistent with our study (19). In these two studies, the most common reason for nonmedical use of Ritalin is to increase concentration and academic goals. In our study, the most common reason is calmness before exams in medical students, and the reasons for the prevalence are in line with the two articles mentioned. The prevalence of nonmedical use of Ritalin in our study was higher among men than women (57.4% vs. 42.6%). However, in the study by Habibzadeh et al., the prevalence rate among men was lower than among women (43.3% vs. 56.7%) (8). One reason for this difference is the less difficult education in the general medicine course compared to the residency course.

The dosage of Ritalin is one of the important points. In our study, the highest consumption rate among students was five tablets (50 mg) or more daily (4.5%), and the lowest consumption rate was less than one tablet (10 mg) daily (54.3%). Twenty-five students used 1 to 2 tablets (10 to 20 mg) daily (36.7%). In this line, Fallah et al. reported that out of 29 Ritalin abusers, 15 (51.7%) subjects started on a daily dose of 5 mg, 2.5 mg/day in 2 (6.9%) individuals; and 9 subjects (31%) recorded a daily dose of more than 10 mg (19). Also, in this study, there was a significant relationship between the consumption of stimulants with gender and education level. However, in our study, there was no significant relationship between the nonmedical use of Ritalin with gender and education level.

Based on the researcher-made questionnaire, 21.7% of the students had a negative opinion, and 28% had a positive opinion regarding the increase in performance by using Ritalin in various fields, such as exams. In line with these results Khademi et al. reported that 20% of medical residents have a positive attitude toward Ritalin consumption (17). The positive attitude, especially among medical students, is one of the risk factors for the higher prevalence of nonmedical use of Ritalin.

Conclusion

The present study shows that the nonmedical use of Ritalin is more common among students than alcohol and cigarettes, and some students have a positive view of using Ritalin to increase concentration and improve performance in exams. Due to the possibility of severe dependence on this substance, more awareness and preventive measures are needed among students.

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