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Frequency of the Benzodiazepines and Serotonin-Specific Reuptake Inhibitors Use in Medical Students: A Mixed Method Study

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Abstract

Research has shown that the prevalence of psychiatric drug use in students, especially in developing countries is increasing. Therefore, in this study, we studied the frequency and reasons for the use of benzodiazepines and and serotonin reuptake inhibitors (SSRIs) in medical students and their relationship with health indicators. In this consecutive combined study, 160 students were selected by available sampling. Data collection tools included the student demographic information Questionnaire, General Health Questionnaire (GHQ_28), and ASSIST questionnaire. After collecting the data, they were entered into SPSS-20 software and P <0.05 was used to declare association. In the qualitative section, by conducting interviews causes and extent of drug use were explained. After the interviews, MAXQDA software was used for coding and analysis. Findings showed that out of 160 participants in the study, 32 (20%) used benzodiazepines and 44 (27.5%) used SSRIs. Significance was found between students' anxiety status with the use of SSRIs during their lifetime (P = 0.0001). The results of the qualitative section on the causes of drug use in students showed that the elimination of anxiety, drug use following the start of the internship, drug use before comprehensive exams, drug use, the feeling of calm, and the presence of certain areas were the main causes of drug use in students. According to the results of the study, it seems that to prevent the use of drugs and manage students' anxiety and stress during the academic period.

Keywords: *Benzodiazepines, Serotonin Inhibitors, Health Index, Medical Students, A Mixed Method study*

Introduction

The goal of medicine is to maintain and promote community health and restore it among the patients. This is realized by a chain of factors where medicine has one of the major roles (1). Since long ago, human beings have used medicine to relieve their pain. Based on historical citations, there has been abuse involved as well. In the statistics of developed countries like the United States, using painkillers and stimulants is more common among medical professionals. One of the reasons for this is the ease of access to this group to medicines relative to other educated groups (2).

Sedatives are considered among the medicines used for different reasons, with or without a doctor's prescription. Depression is of the reasons for using sedatives. Studies reveal that the prevalence of depression among the students taking sedatives was way higher than other students (3,4).

The prevalence of the use of psychotropic medicines among the students is seen because of greater familiarity and the problems ahead. The sedative and hypnotic medicines widely used in Iran do not contain any of the addictive substances, and even quitting them because they might be accompanied by seizures may be more varied and dangerous than quitting the addictive substances (5,6).

Medicine abuse might interfere with a person's ability to learn and develop technical skills and thus affect their life quality (7). The use and abuse of substances such as alcohol, cigarettes, and neuropsychiatric medicines are the most serious human problems in recent years and one of the most critical problems countries face today, especially among students (8).

Depression is of the most prevalent mental disorders in the world. Mixed antidepressants and psychotherapy are used to treat major depression. Tricyclic antidepressants (TCAs) are the most common medicines for the treatment of depression, with many known side effects, especially anticholinergics, postural hypotension, sleep disorders, and sexual disorders after their use (9). Clomipramine, citalopram, fluoxetine, fluvoxamine, paroxetine, and sertraline have proven effective in treating the symptoms of many mental illnesses like depression, obsession, and compulsion independent of their antidepressant properties. Specific serotonin reuptake inhibitors are the most effective medicines for the treatment of the obsessive-compulsive disorder (OCD) (10).

Various studies have revealed that the prevalence of using neuropsychiatric medications among students is increasing, especially in developing countries. Although there are no accurate statistics on the prevalence of alcohol, cigarettes, and neuropsychiatric medications in Iran, studies indicate a high prevalence of these substances among the student population (11).

A group of neuropsychiatric medications used by individuals, especially students, are antidepressants such as selective serotonin reuptake inhibitors (SSRIs), used to treat depression and some types of anxiety and personality disorders (12).

The main application of SSRIs is in the treatment of clinical depression. SSRIs are usually prescribed for anxiety disorders, such as social anxiety, panic disorders, OCD, eating disorders, chronic pain, and sometimes post-traumatic stress disorder. Moreover, they are usually used to treat depersonalization disorder. However, it usually leads to poor results. SSRIs are effective in treating irritable bowel syndrome with symptoms of pain and constipation. Four to 6 weeks are needed to assess the effectiveness of SSRIs in treating depression. Serotonin reuptake inhibitors deter the reabsorption of serotonin in the synaptic space and increase the value of this neurotransmitter (13,14).

Benzodiazepines could be effective in relieving or preventing a panic attack in high-risk situations. However, there are alternatives to them. SSRIs such as sertraline (Zoloft) and escitalopram (Lexapro) are the options for managing chronic general anxiety in people in need of medication. Continuation of use reduces the sensitivity of the brain, and not only more medication is needed to get the same result as before over time, but also anxiety becomes worse without medication. It becomes difficult to stop taking benzodiazepines once started to use, and stopping the medicine can be accompanied by serious symptoms. Insomnia, irritability, increased anxiety, fear, and restlessness are considered some of these symptoms (15).

According to the studies carried out, medicines such as benzodiazepines and SSRIs, commonly used to control or reduce anxiety, are more common among single-home students or students with lower GPAs and those smoking cigarettes and other medicines. Furthermore, the students with a history of visiting a psychiatrist increase or decrease the amount of medication with their information instead of going back to a specialist. This is more prevalent among medical and paramedical students. Furthermore, the level of student's awareness about the adverse side effects of neuropsychiatric medicines has to be increased. Benzodiazepines could reduce the ability to think, impair memory, and result in reduced ability to respond to emergencies. It could diminish the learning abilities of students. These side effects could be experienced even at the lowest doses of these medicines (16).

In the studies carried out in Iran and the world, using these medicines among these students is relatively high. Furthermore, the self-administration of anti-anxiety medicines and their etiology are of great significance. Students with low interest in the field of study, medical students, and those with a history of visiting a psychiatrist are at greater risk of excessive use of these medicines (17).

Medicine abuse in students could lead to different educational, economic, personal, and social harms and result in changes in the life quality of the students, and could affect their overall health (18).

Given the significance of this issue, its study in a mixed study seems necessary to understand the effective factors of the use of benzodiazepines and SSRIs among medical students. In this sequential mixed study, firstly, the frequency of consumption of benzodiazepines and SSRIs in medical students of Guilan University of Medical Sciences and its relationship with health indicators will be measured in the quantitative section and then qualitative research will be used to validate the findings in the quantitative section. Thus, the participants of the qualitative section will be selected after conducting a small section from among those students answering positively to the questions related to medicine use, and students' opinions about the causes and extent of drug use will be explained by conducting interviews.

Using both types of data allow researchers to gain a deeper understanding of the phenomenon. In sequential mixed studies, the qualitative phase of the study is carried out to understand the findings of the quantitative part better and the unusual results obtained in the quantitative part (19).

Medical students have a relatively harder time in their studies compared to other disciplines, along with long and difficult shifts, distance from family in many cases, and environmental pressures during their studies, all of which can be the factors making some students take sedatives. The studies revealed that few studies in Iran have examined the extent and prevalence of serotonin-specific sedatives and SSRIs among students. Thus, this study intended to examine the frequency and causes of benzodiazepine and SSRIs among medical students of Guilan University of Medical Sciences and their relationship with Raderick's health indices in a mixed study.

Materials and methods

The study was sequential-mixed in terms of implementation method where qualitative research was used to validate the research findings in the quantitative part. The quantitative part of the study was cross-sectional analytical as follows. The population of the study was medical students of Guilan University of Medical Sciences in 2021, selected according to inclusion and exclusion criteria reported from the population according to the report of the Deputy Minister of Education, about 450 people.

Inclusion and exclusion criteria

The students had to be studying medicine at Guilan University of Medical Sciences during the period in question. Among the cases leading to exclusion of medical students was the unwillingness to participate in the study and answering less than 30% of the questions in the questionnaires.

Sampling

Purposive sampling was used in the study. In this method, the participants in the quantitative section were selected based on the answers to the questions they were asked about the use of medicines and the specific knowledge and information they had about the medicine used for sharing this information. Sampling in the qualitative section continued until information saturation. As already stated, in this study, we further examined general health (based on good, moderate, and poor general health) and tried to include as many samples as possible in the qualitative section selected for the interview from all groups to examine a more complete range. Ultimately, after the final examinations, among the students taking the medicines, seven students were further analyzed for benzodiazepines and 10 for SSRIs. After contacting these people and explaining the title and method of work and mentioning the qualitative section as a complement to the study, they were invited and finally, 11 people (7 SSRIs and 4 benzodiazepines, of whom three were using both) accepted to be interviewed and participated in it.

Quantitative data collection

After communicating with the students, the following questionnaires were sent to them through cyberspace if they wished to enter the project.

Data collection was done by the following three questionnaires in this study:

* Student Demographic Information Questionnaire including age, gender, marital status, level of education, place of residence

General Health Questionnaire (GHQ_28): The questionnaire, which is developed by Goldberg, is of the most famous screening tools for mental disorders, available as 12, 28, 30, and 60 question forms. Here, a 28-question form was presented whose questions included four subscales, each of which has 7 questions. Questions 1-7 have to do with physical symptoms and general health status (20).

Screening test for alcohol, cigarettes, and drugs based on ASSIST questionnaire: Consumption of sedatives and SSRI in the last three months and throughout the life are determined based on questions 1 and 2 of this questionnaire (21).

Qualitative data collection

This part of the study was thematic content analysis. Recorded interviews with students were about medicine use experiences and reasons for using it. The data collection method in this study was a semi-structured interview. The interview place is a quiet room on the research site. The interviews were recorded on a small tape recorder and implemented at the earliest opportunity and analyzed simultaneously.

Data analysis

The collected data was descriptive and inferential and methods such as percentage, mean, frequency, and standard deviation were used. K^2 statistical method and logistic regression were used to analyze the data. The software used was SPSS-20. $P < 0.05$ was used to declare association.

Qualitative data analysis: Data analysis called for the researchers to live with the data or be immersed in the data; therefore, all interviews were typed after listening, and the interview texts were reviewed. Then according to Merill & Wests model, thematic analysis was used to analyze the data (Merill & Wests, 2009). The interview text was coded using MAXQDA 20 software, the classes were formed and finally,

the themes were extracted after organizing and comparing the codes.

Quantitative section results:

Table 1 is the personal characteristics of students studying in the medical field under study.

Results

Table 1. Examining the personal characteristics of medical students

Variables	Status	Whole population		Benzodiazepine consumers		SSRI consumers		Consumer of both	
		Frequency	Percent	Frequency	Percent	Frequency	Percent	Frequency	Percent
Gender	Man	71	44.4	15	46.9	19	43.2	8	38.1
	Female	89	55.6	17	53.1	25	56.8	13	61.9
Age (year)	Less than or equal to 23	86	53.8	15	46.9	19	43.2	8	38.1
	More than 23	74	46.2	17	53.1	25	56.8	13	61.9
Age (year) Mean ± SD		23.15± 2.5		23.78± 2.18		66.23±2.25		24.14±2.17	
Marital status	Single	151	94.4	29	90.6	40	90.9	18	85.7
	Married	9	5.6	3	9.4	4	9.1	3	14.3
Grade	Science	54	33.8	3	9.4	9	20.5	1	4.8
	Physiopathology	18	11.2	8	25	6	13.6	5	23.8
	Internship	35	21.9	8	25	14	31.8	6	28.9
	Workmanship	53	33.1	13	40.6	15	34.1	9	42.9
Address	With family	85	53.1	10	31.2	19	43.2	6	28.6
	Dormitory	32	20	11	34.4	14	31.8	9	42.9
	Single	36	22.5	10	31.2	8	18.2	5	23.8
	With friends	7	4.4	1	3.1	3	6.8	1	4.8

Chi-square test showed no statistically significant relationship between gender, age groups, and marital status of the studied students with the status of benzodiazepine use during their lifetime. However, there is a difference between the educational level of the studied students (P = 0.002) and the address of the studied students with the status of benzodiazepine use during their lifetime (P = 0.026), so the use of this medicine in interns and students in the dormitory was more, lived alone or with family. The Chi-square test revealed no statistically significant relationship between gender, age groups, marital status, and educational level, as well as the residence of the studied students and the status of SSRI use during their lifetime.

Use, reasons for consuming arbitrarily and getting to know them

The Chi-square test showed a statistically significant relationship between the lifetime use of benzodiazepines and SSRIs with its use (P = 0.0001). Fifty students did not answer the question about taking benzodiazepines and 47 students did not answer the question about how to take SSRIs (Table 2).

Table 2. Evaluating the consumption status of benzodiazepines by students studying medicine according to the method of consumption

Consumption type	Had		Did not have		Statistical estimation
	Frequency	Percent	Frequency	Percent	
Lifetime use of benzodiazepines					
With a doctor's prescription	16	18.2	72	81.8	P=0.0001
Arbitrary use without a doctor's prescription	13	72.2	5	27.8	
Consumption after a doctor's prescription	3	75	1	25	
Total	32	29.1	78	70.9	
Lifetime use of SSRI					
With a doctor's prescription	27	28.1	69	71.9	P=0.0001

Arbitrary use without a doctor's prescription	10	83.3	2	16.7	
Consumption after a doctor's prescription	3	60	2	40	
Total	40	35.4	73	64.6	

Using the Chi-square test showed a statistically significant relationship between lifetime use of benzodiazepines with the causes of consumption “repeated doctor's prescription” and “relief of muscle pain”, “improvement of mood” and “elimination of insomnia” among the students (P = 0.042 = P = 0.029, P = 0.023 and P = 0.021). However, such a significant relationship was not observed regarding the possibility of over-the-counter medication, reducing exam stress, increasing exam focus, increasing confidence, and increasing learning ability. Additionally, the Chi-square test showed a statistically significant relationship between lifetime use of SSRIs with the causes of “repeating the doctor's prescription”, “improving mood” and “increasing learning ability” among the students studied (P = 0.002, P = 0.001 and P = 0.045). However, such a significant relationship was not observed in relieving muscle pain, the possibility of over-the-counter medication, reducing test stress, relieving insomnia, increasing test focus, and increasing learning ability.

Chi-square test showed a statistically significant relationship between the lifetime use of benzodiazepines and how familiarity with the medicine (P = 0.012), so that in people consuming this medicine familiarity in 12.5% was by friends and relatives, 28.6% by reading books or the Internet, 60% by repeating a doctor's previous prescription, 57.1% by visiting and asking the doctor indirectly, and 22% by a doctor's prescription. Moreover, 42 people did not answer the question of how they got acquainted with the medicine. Chi-square test showed a statistically significant relationship between the lifetime of SSRIs and how they got familiar with the medicine so that in people using the medicine, familiarity in 21.9% was by friends and relatives, 17.9% by reading books or the Internet, 60% by repeating the doctor's previous prescription, 71.4% by visiting doctor indirect and asking questions and 51.2% by doctor's prescription. Moreover, 42 people did not answer the question of how they got acquainted with the medicine. (P = 0.002) 42 people did not answer the question of how they got acquainted with the medicine.

Physical health status, anxiety, social functioning, depression, general health

Chi-square and Fisher's Exact test indicated no statistically significant relationships between physical health status, anxiety, social functioning, depression, and general health of the students examined using benzodiazepine during their lifetime. Chi-square and Fisher’s Exact tests showed no statistically significant relationship between physical health status, social functioning, depression, and general health of the studied students with benzodiazepine use status in the last months. Fisher's Exact test indicated a statistically significant relationship between the anxiety status of the students and the consumption of benzodiazepines in the last months (P = 0.001) (Table 3). Chi-square and Fisher's Exact tests revealed no statistically significant relationship between anxiety, social functioning, depression, and general health of the studied students with the status of benzodiazepines consumption monthly (one to three times a month). Fisher's Exact tests showed a statistically significant relationship between the physical health status of the studied students and the status of benzodiazepine use monthly (one to three times a month) (P = 0.01) (Table 3). Using Chi-square and Fisher's Exact tests, it was found that there was no statistically significant relationship between physical health status, anxiety, social functioning, depression, and general health of the studied students with the status of benzodiazepine use weekly (one to 4 times a week). Chi-square and Fisher's Exact tests found a statistically significant relationship between the anxiety status of the studied students and the status of benzodiazepine use weekly (one to 4 times a week) (P = 0.029) (Table 3).

Table 3. The relationship between physical health status, anxiety, social functioning, depression, general health, and benzodiazepine use

Variable	**Status**					**Statistical estimation**
		Had		**Did not have**		
		Frequency	Percent	Frequency	Percent	
Consumption of benzodiazepines in the last quarter						
Anxiety (status)	Lowest (0-4 points)	0	0	7	100	P=0.001
	Mild (5-10 points)	7	25.9	20	74.1	

	Medium (11-16 points)	1	1.5	66	98.5	
	Intense (17-21 points)	5	8.5	54	91.5	
Monthly consumption (one to three times a month) of benzodiazepines						
Physical health status	Lowest (0-4 points)	2	3.1	63	96.9	P=0.01
	Mild (5-10 points)	1	1.4	73	98.6	
	Medium (11-16 points)	4	20	16	80	
	Intense (17-21 points)	0	0	1	100	
Weekly consumption of benzodiazepines (one to four times a week)						
Anxiety status	Lowest (0-4 points)	0	0	7	100	P=0.029
	Mild (5-10 points)	3	11.1	24	88.9	
	Medium (11-16 points)	0	0	67	100	
	Intense (17-21 points)	1	1.7	58	98.3	

Chi-square and Fisher's Exact tests showed no statistically significant relationship between physical health status, social functioning, depression, and general health of the students using SSRIs during their lifetime. However, a statistically significant relationship was seen between the anxiety status of the students using SSRIs during their lifetime (P = 0.0001) (Table 4). Chi-square and Fisher's Exact tests showed no statistically significant relationship between physical health status, the social function of the students examined and the status of SSRIs in the last three months. However, there were no statistically significant relationships between the state of anxiety, depression, and general health of students in the study with the use of SSRI in the last three months (P = 0.024, P = 0.014, and P=0.04) (Table 4). Chi-square and Fisher's Exact tests showed a statistically significant relationship between physical health status, anxiety, social functioning, and general health of students using SSRIs monthly (one to three times a month). Fisher's Exact test showed a statistically significant relationship between the depression status of the students examined and the status of using SSRIs monthly (one to three times a month) (P = 0.009). (Table 4). Chi-square and Fisher's Exact tests showed a statistically significant relationship between physical health status, social functioning, depression, and general health of the studied students with the status of using SSRIs weekly (one to four times) as well as daily consumption (5 to 7 days per week). However, there was a statistically significant relationship between the depression status of the students and using SSRIs weekly (one to 4 times a week) as well as daily consumption (5 to 7 days a week) (P = 0.036) (Table 4).

Table 4. The relationship between physical health status, anxiety, social functioning, depression, general health, and consumption of SSRIs

Variable	**Status**					**Statistical estimation**
		Had		**Did not have**		
		Frequency	Percent	Frequency	Percent	
Lifetime use of SSRIs						
Anxiety status	Lowest (0-4 points)	4	57.1	3	42.9	P=0.001
	Mild (5-10 points)	17	63	10	37	

	Medium (11-16 points)	11	16.4	54	83.6	
	Intense (17-21 points)	12	20.3	47	79.7	
Using SSRIs in the last month						
Anxiety status	Lowest (0-4 points)	1	14.3	6	85.7	P=0.024
	Mild (5-10 points)	8	29.6	19	70.4	
	Medium (11-16 points)	4	6	63	94	
	Intense (17-21 points)	8	13.6	51	86.4	
Depression status	Lowest (0-4 points)	9	9.2	89	90.8	P=0.014
	Mild (5-10 points)	6	12.8	41	87.2	
	Medium (11-16 points)	4	40	6	60	
	Intense (17-21 points)	2	40	3	60	
General Health	Lowest (0-4 points)	1	3/33	2	66.7	P=0.04
	Mild (5-10 points)	16	11	129	89	
	Medium (11-16 points)	4	33.3	8	66.7	
	Intense (17-21 points)	0	0	0	0	
Taking SSRIs monthly (one to three times a month)						
Depression status	Lowest (0-4 points)	8	8.2	90	91.8	P=0.009
	Mild (5-10 points)	6	12.8	41	87.2	
	Medium (11-16 points)	4	40	6	60	
	Intense (17-21 points)	2	40	3	60	
Taking SSRIs weekly (one to four times a week) as well as daily (5 to 7 days a week)						
Depression status	Lowest (0-4 points)	8	8.2	90	91.8	P=0.036
	Mild (5-10 points)	6	12.8	41	87.2	
	Medium (11-16 points)	3	30	7	70	
	Intense (17-21 points)	2	40	3	60	

Quality section results:

In the second stage of the study, after analyzing the quantitative data and answering the question of the qualitative part of the

study (explaining the understanding of medical students of Guilan University of Medical Sciences about the use of benzodiazepines and SSRIs), the students reported medicine use in questionnaires were invited to an interview - 11 students. The statements of the students participating in the study are given as codes and classes in the table above. The categories obtained from the analysis of student interviews are:

1. Factors facilitating anxiety among the students:

Students' statements indicate the return of anxiety states following mental stress, passing the university entrance exam, the transition from face-to-face training to virtual training in the corona and virtual exams, perfectionism in students, and the return of anxiety states with the start of new courses (tenancy, internship, and so on), and the stress of attending the hospital are of the factors that facilitate the students' anxiety. One of the students stated: “It was almost a year before I passed the university entrance exam. I failed the entrance exam for a year and at one point I was in a state of extreme anxiety and panic, and then I went to a psychiatrist for that reason and he prescribed it for me.” (p1).

2. Negative social function among the students:

“The analysis of the statements of students taking medicines shows lack of good social functions, less importance to relationships with friends and colleagues, little interaction with others, and lack of socialization among the problems of these students.” One of the students stated: “Others think I am gentle. That I do want to get acquainted with someone quickly is not the case.” (p2).

3. Problems in the general health of students:

Sleep disturbances, changes in appetite and mood swings, and physical symptoms of anxiety were among the general health problems of the students interviewed.

One of the students, taking medication for sleep disorders, pointed out: “I was very sleep deprived during the shifts, and I use these medicines to have better sleep on non-awake days, for example, from 8-9 pm to 6 am” (p8).

4. Causes of medicine use by students:

Students' statements indicate that the main reasons for students turning to medicines are relieving anxiety, taking medicines after the start of the internship, taking medicines before comprehensive exams such as basic science exams, arbitrary medicine taking, feeling calm after taking medicines, attending special units, good relationships after taking medicine, etc. One of the students in this field says: “Following the corona epidemic and the first semester exams, I was not a cheater and I only cheated in the general course exams. I always wanted to study myself,” said one student. I had some perfectionism in me. Moreover, the fact that I wanted to study on my own, and caused my stress in the first semester exams to manifest itself in the form of gastrointestinal symptoms. I wrote a program for myself and if I did not do it. I was stressed. I talked to the doctor ... and he prescribed me citalopram and alprazolam.” (p10).

5. Feeling depressed:

The statements of the students participating in the study show that these students suffered from depression states, hopelessness about the future, the insignificance of affairs, feelings of emptiness in the world, and the onset of depression from the beginning of school were examples of this class in analyzing student interviews. One of the students said: “I had a very severe depression from the beginning, so I cried when I talked to anyone.” (p7).

Mixing quantitative and qualitative results

The results obtained from the qualitative stage were compared in the following to increase the validity obtained from the results of the quantitative stage.

Mixing results

The main reason for the tendency to use medicines among medical students

The results of the qualitative section brought about a deeper understanding of the causes of medicine use in medical students in addition to the items mentioned in the quantitative section. One of the things that came out of the quantitative results was a better mood. After examining the codes obtained in the quality section, feeling relaxed after taking the medicine and improving relationships with friends and acquaintances after taking the medicine is the points that students experience in improving their mood after taking the medicine.

Anxiety status

The quantitative results indicated moderate anxiety in students taking benzodiazepines, and mild anxiety in students taking SSRIs and taking both medicines together, whereas the results of the qualitative section led to a deeper understanding of the causes of anxiety among the students. Identifying the causes of anxiety in this section helps determine effective measures to eliminate it in various stages of medical students' education.

Social functioning

The quantitative results showed mild social functioning in consumers of benzodiazepine, SSRI, and those using both. While the results of qualitative analysis of students taking the

medicine showed that students had positive and negative social functions. The results of the qualitative study revealed that some students had poor and negative social functioning and were not sociable in the eyes of others and had less interaction with others. While some other students in this study had a positive social function and had a good interaction with others.

Depressive condition

Quantitative results showed minimal depression in students taking benzodiazepines, SSRIs, and co-users. The results of the qualitative part of the study confirm the results of the quantitative part of the study.

Physical symptoms and general health status

The results of the quantitative section showed poor physical health in benzodiazepine, SSRI, and users of both of them. Additionally, mild general health was observed in benzodiazepine and SSRI users and general health was the lowest for users of both medicines. The results of the qualitative part of the study led to the identification of factors that disrupt students' health, and the physical problems that students suffer during their studies.

Discussion

The results indicated that 55.6% of the students examined were women. There are no statistically significant relationships between gender and using benzodiazepine and SSRI during their lifetime. Even though girls had a higher frequency, the number of consumers in both genders was almost equal compared to the total population of respondents. Thus, the analysis showed that gender did not affect consumption. In Rostami et al. (19), 59.5% of the participants were female students. As in our study, in Dehdashti et al. (22), more than half of the students were female; however, the results indicated that gender was significantly related to the use of neuropsychiatric medicines, which was not in line with our study. Again, as in our study, by Ansari et al. (17), most of the participants were girls. Nonetheless, their results showed that the number of boys taking medicines was more than girls, and as in the present study, there were no significant relationships between gender and medicine use. Zia al-Dini et al. (18) indicated that the gender of individuals was directly associated with the value and motivation of neuropsychiatric medicines and sedatives, which was not in line with our study. George et al. (23) showed the gender of the participants as an effective factor in their general health status and direct relation to the use of neuropsychiatric medicines. Furthermore, in George et al. (23), using benzodiazepines was much higher in girls than boys. Perhaps one of the reasons for this, stated in some studies, is that girls are more dependent on their families, in which the prevalence of anxiety and depression is higher than boys.

Moreover, 53.8% of the students were younger than 23 years of age. There are no statistically significant relationships between students' age and benzodiazepine and SSRI use during their lifetime. In contrast to our study, Zia al-Dini et al. (18) indicated that the age of individuals was directly associated with the value and motivation of neuropsychiatric medicines and sedatives. In Dehdashti et al. (22), the mean age of the students was 22 years, and age was significantly associated with the use of neuropsychiatric medicines. George et al. (23) showed that the age of the participants was directly associated with the use of neuropsychiatric medicines such as benzodiazepines. According to George et al. (23), with an increase in the age of participants, the consumption of benzodiazepines increased and the age of the people was directly associated with the consumption of these medicines, which was in line with our study. Perhaps one of the reasons is that with the increase in age and entering a higher stage, educational tasks and anxiety and so on increase that leads to more consumption.

Furthermore, 94.4% of students were single and there were no statistically significant relationships between marital status and benzodiazepine and SSRI use during their lifetime. As our result, Ansari et al. (17) found no significant relationships between students' marital status and the use of sedatives and neuropsychiatric medicines. Dehdashti et al. (22) found a significant relationship between students' marital status and the use of neuropsychiatric medicines that was inconsistent with our results in the study.

Regarding studies, 33.8% of students were studying basic sciences, 11.2% in physiopathology, 21.9% in an internship, and 33.1% in an internship. The results showed a statistically significant relationship between the educational level of the students and the status of benzodiazepine use during their lifetime ($P = 0.002$). Ansari et al. (17) students' educational level had a significant relationship with the use of sedatives and neuropsychiatric medicines, in line with our study. Like the present study, Zia al-Dini et al. (18) indicated that the educational background of individuals was directly associated with the value and motivation of using neuropsychiatric medicines and sedatives. Dehdashti et al. (22) found a significant relationship between the level of education and the use of neuropsychiatric medicines, which was similar to our results. The high use of these medicines in medicine seems to be due to the long academic years, and the closer the students get to the senior years, the more anxiety and work pressure they suffer, these factors can be one of the reasons for the effectiveness of the degree with the use of neuropsychiatric medicines.

Moreover, 53.1% of the students examined lived with their families, 22.5% lived alone, 20% lived in dormitories and 4.4% lived with friends. There was no statistically significant relationship between students' residence and SSRI use status during their lifetime, but there was a statistically significant relationship between students' residence status and benzodiazepine use status during their lifetime (P = 0.026). As in the present study, Dehdashti et al. (22) found a significant relationship between the residence of students with the use of neuropsychiatric medicines. Living with the family seems to bring peace of mind to the students they have more supervision over the children and the people who live with the family use fewer neuropsychiatric medicines. According to a study by Kinderman et al. (24), students away from their families reported more symptoms of anxiety and depression, and this is one of the reasons why students use more neuropsychiatric medicines and sometimes medical students use them arbitrarily.

Among the 160 students examined, 20% used benzodiazepines in their lifetime. Among students taking benzodiazepines, 50% of benzodiazepines were prescribed by a doctor. Among 160 students, 27.5% used SSRIs during their lifetime. Among SSRI students, 65.9% had SSRIs based on a doctor's prescription and 27.3% had an arbitrary use without a doctor's prescription. Analyses show a statistically significant relationship between the lifetime use of benzodiazepines and how it is used (P = 0.0001). In Ansari et al. (17), the history of visiting a psychiatrist was directly related to the use of neuropsychiatric medicines. One reason for this could be work stress and being away from family, which has led students to use more neuropsychiatric medicines.

Of the 160 people who participated in the study, 121 students expressed their views, and 266 reasons for the arbitrary use of serotonin reuptake inhibitors (SSRIs) were cited as “improving mood” by 23.3% and then “reducing test stress” by 16.9%. Then “repetition of the doctor's prescription” was reported with 12.4% of cases for arbitrary use of SSRIs. Parades et al. (25) showed that 10.5% of the students used benzodiazepines arbitrarily once in their lifetime. Of these, 6.1% used benzodiazepines last year and 3.9% are using them now. Diazepam was the most widely used BZD without a prescription and pharmacies were more accessible. Among the main reasons for taking benzodiazepines were insomnia, anxiety, stress, depression, and family and economic problems. Using benzodiazepines for non-pharmacological purposes is associated with problems such as sedation.

Among the students expressing their opinions, the highest percentage was associated with familiarity with medicines through doctor's prescription (34.7%), followed by “acquaintance through friends and relatives” with 27.1%, followed by “reading books or the Internet” with 23.7% of the cases. Analyses reveal a statistically significant relationship between the lifetime use of SSRIs with the way of getting familiar with this medicine (P = 0.002) and using it (P = 0.0001). In George et al. (23), benzodiazepines were mainly prescribed by a physician and a direct relationship existed between the use and the method of preparation of this medicine as in the present study.

According to the results of this study, there was a statistically significant relationship between the use of benzodiazepines with the causes of “repeated prescription” and “relief of muscle pain” and “improvement of mood” and “elimination of insomnia” in the studied students (P = 0.042, P = 0.023 and P = 0.021). Moreover, there was a statistically significant relationship between the use of SSRIs and the causes of “repeated prescription”, “improvement of mood” and “increased learning ability” among the students (P = 0.002, P = 0.001, and P = 0.045).

There was no statistically significant relationship between physical health status, social functioning, depression as well as the general health of the studied students with the status of benzodiazepines and SSRIs during their lifetime. However, a statistically significant relationship was found between the anxiety status of the students and using SSRIs during their lifetime (P = 0.0001), whereas anxiety had no relationship with benzodiazepines. Contrary to the results of the present study, in Rostami et al. (19), there was a statistically significant difference between the mean scores of social functioning anxiety symptoms and depression in different disciplines and between the mean scores of general health and social functioning in the studied variables. In George et al. (23), anxiety was stated as the most important factor in the use of neuropsychiatric medicines, which was in line with our study. According to Castadelli et al. (26), stress and depression are seen as effective factors in the use of addictive medicines. As the level of anxiety caused by studying and working students increased, so did the use of neuropsychiatric medicines. Thus, the components of burnout, anxiety, and depression can affect the rate of consumption of these medicines. According to Dunlop et al. (27), benzodiazepines and SSRIs were widely used to treat anxiety and depression as one of the key factors for the use of these medicines was the anxiety of students and adults.

Qualitative research was used to validate the findings of the quantitative study. Using both types of databases in a study brings about a better understanding of the phenomenon examined. The same method was used in Harizchi et al. (28) - qualitative information was recorded using a semi-structured interview for 10-20 minutes. It was then read to the students once more and confirmed after recording. Besides the interviewer, the observer witnessed the interview and confirmed the validity of the data (validity, reliability) as well.

The analysis of the interviews with students revealed that the main reason for the tendency to use medicines among medical students was the pressure of university studies. Anxiety and insomnia were the key predictors of the declining general health of students with substance abuse. Furthermore, their results indicated that the prevalence of substance abuse among medical students was unexpected.

Another study by Barry et al. (29) on doctoral students in Australia to understand mental health and the challenges associated with the study period through a mixed study showed that in the quantitative part of the study, these students had high levels of anxiety, depression, and stress compared to the normal population of the same age. In the qualitative section of the study, the most challenging issues in the mental health of students were the development of general skills, and self-management, especially maintaining motivation during the study period.

Conclusion

Based on the findings, the highest percentage was related to familiarity with medicines through a doctor's prescription; nonetheless, some students reported arbitrary use without a doctor's prescription, where reduced stress and increased learning ability were among the issues stated by them. Examination of the study indicated that the main reason for the tendency to use neuropsychiatric medicines among medical students was the pressure of university studies. Anxiety and insomnia were among the key predictors of the decreased general health of students. The study revealed that medical students voluntarily participating in the study suffered only from minor stress. However, many students showed clear signs of stress after the examinations. Students should also be evaluated before starting the study to evaluate the true effect of these drugs on depressive symptoms and anxiety disorders.

Limitations

As the study was carried out during the Covid 19 pandemic, it was impossible to reach all students, and some students did not complete the questionnaires well, and some of the data could not be used and were excluded.

This sequential mixed study was conducted in the population of medical students of Guilan University of Medical Sciences in 2021 with ethics code 1400.405 IR.GUMS.REC.

Ethical Considerations

All ethical principles are observed.

Authors' contributions

All three authors were involved in the design and formulation of the argument.

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Conflict of interest

There is no conflict of interest.

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