Acta Scientiarum
http://periodicos.uem.br/ojs/acta
ISSN on-line: 1807-8648
Doi: 10.4025/actascihealthsci.v46i1.65548

Prevalence of anxiety and self-medication in medical students

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ABSTRACT. Anxiety is a natural and fundamental reaction of self-preservation. But in excessive amounts, to the point of significantly affecting the individual's life, it is pathological and may lead to the practice of self-medication, which, in turn, may represent damage to health. Due to some reasons, such as intense stress, and long study hours, many medical students are more likely to develop psychiatric disorders, such as anxiety. The present study aimed to analyze the prevalence of anxiety and self-medication in medical students at a higher education institution. The study was carried out in a higher education institution in Teresina, state of Piauí, in April and May 2022. The target audience was a group of medical students from the first to the twelfth period. They were given electronic forms via instant messaging application, containing the Beck Anxiety Inventory, sociodemographic (with reports of self-medication), and academic questionnaires. The responses were processed by the statistical software 'Statistical Package for the Social Sciences' (SPSS) 20.0 to run a chi-square correlation. The results showed that 86% students were aged 16 – 26 and were in the basic cycle. The female participants showed a greater correlation with cases of anxiety, which may be related to hormonal factors that usually start at puberty. As for self-medication, 64% students answered that they do not practice it, which differs from several studies. Therefore, women had a greater correlation with anxiety, probably due to physiological and environmental stimuli. Self-medication did not influence a correlation with cases of anxiety.

Keywords: anxiety; self-medication; medical students.

Received on February27, 2022.
Accepted on March14, 2023

Introduction

Anxiety is a human emotion considered normal, and generates feelings of apprehension and unpleasant physical manifestations, being considered a fundamental reaction of self-preservation (Leão, Gomes, Ferreira, & Cavalcanti, 2018). When anxiety is at a pathological level, it represents one of the most common psychiatric disorders and is considered one of the most underdiagnosed pathologies, since it is rare for the individual to seek care (Zuardi, 2017).

This disorder affects the population of the most varied socioeconomic categories. However, its higher prevalence is in women and is associated with genetic and environmental factors, low socioeconomic status, history of chronic diseases, and lived experiences, such as inappropriate use of licit substances, such as alcohol, tobacco, and illicit substances during personality development (Costa, Branco, Vieira, Souza, & Silva, 2019).

This pathology has two aspects, the cognitive, in which it is represented by subjective feelings, such as apprehension, fear, undefined tremors, and tension, among others. And the somatic aspect is manifested by physiological changes such as tachycardia, vomiting, diarrhea, insomnia, and others (Araújo, Mello, & Leite, 2007).

Students, especially in the health area, when they experience the classroom, the job market, study time, and academic work time, have a higher score of psychological disorders, such as anxiety, due to daily stress (Souza & Menezes, 2005). Due to this, for therapeutic intervention, there is self-medication mainly anxiolytics among students, which becomes a public health problem (Gras, Champel, Masmoudi, & Liabeuf, 2020).

Self-medication is a common practice in different cultures and consists of the use of any type of drug without a prescription from a trained professional, the user spontaneously selects the drug in order to solve a health problem. This inappropriate attitude can cause damage such as drug interaction, antimicrobial resistance, and adverse drug reactions, in addition to masking the risk of evolutionary diseases (Gama & Secoli, 2017).

Among the reasons that lead to this recurrent practice in students, the following stand out: media exposure, increase in drug advertising, advice from family or friends, health problems considered trivial, time savings, unavailability of transportation, convenience, self-management of symptoms, the urgency of the problem, a physician who was not available or with enough information. In this way, self-medication is seen as the best solution for the user (Helal & Abou-Elwafa, 2017).

Bearing in mind that the undergraduate degree in Medicine is a period of intense stress, due to the high competitiveness, the high academic workload, and the increase in study time, among others, it is possible to perceive, over time, a greater number of students with psychiatric disorders, such as anxiety, which can influence self-medication levels (Moraes, Bernardina, Andriato, Dalvi, & Loyola, 2018; Neponuceno, Souza, & Neves 2019). Thus, the present study aimed to identify the prevalence of anxiety and self-medication in medical students from a higher education institution in Teresina, state of Piauí, throughout the course.

Methods

Study location and type of study

This was a descriptive, exploratory, quantitative study. The research was carried out in a private higher education institution, located in the municipality of Teresina, state of Piauí, from April to May 2022. The University Center was accredited by Ordinance MEC 1130 of 11/09/2012 and on July 9th, 2004 obtained authorization to offer the Medical program. In addition, the Institution also offered courses in nursing, dentistry, physical therapy, speech therapy, law, nutrition, biomedicine, physical education, bachelor's degree in business administration, and technological degree in fashion design.

Population and sample

The population consisted of 1,445 medical students from the aforementioned institution. According to a finite sample calculation made with a 5% margin of error and 95% confidence level, it was found that the sample consisted of 304 students. To obtain this result, the formula below was used to define the sample:

$$n = N.Z^2.p.(1-p)/Z^2.p.(1-p)+e^2.(N-1)$$

where:
n = calculated sample
N =population
Z = standardized normal variable associated with the confidence level
p = true probability of the event
e = sampling error

The study was carried out with medical students, from the first to the twelfth period of the program, duly enrolled in the aforementioned higher education institution in the municipality of Teresina, state of Piauí. Participants who did not return with fully completed questionnaires were excluded.

Data collection: instruments and procedures

As shown in Figure 1, after selecting and preparing the questionnaires to be analyzed, we incorporated the Informed Consent into them, which guarantees the dignity and protection of people who agree to participate in the research. Subsequently, data were collected using an electronic form, which was sent via an instant messaging application (social networks) and disseminated in the institution. Participants answered standardized and validated questionnaires to analyze the anxiety index in medical students.

Anxiety-related data were analyzed using the Beck Anxiety Inventory, a multiple-choice questionnaire that measures the level of anxiety symptoms, including numbness, palpitation, sweating, anguish, and others. From the question, the psychic condition can be inferred. The answers correspond to numbers and can be quantified later, among them: no - 0, slightly - 1 (it didn't bother me much), moderately - 2 (it was unpleasant, but I endured it), and severely - 3 (almost I couldn't stand it).

When subsequently quantified, people who had scores $\leqslant 10$ have a minimal level of anxiety, those 11 – 19 have mild anxiety, those whose sum has a result of 20 – 30 show a moderate level, while people with scores $\geqslant$ 31 have a severe level.

Sociodemographic data concerned age, sex, marital status, monthly family income, education, and religion. In addition, academic characteristics such as the period of the program, daily study hours, link with

the institution, work, domestic and family aspects, self-medication (frequency of some medication), and some mental disorders were analyzed.

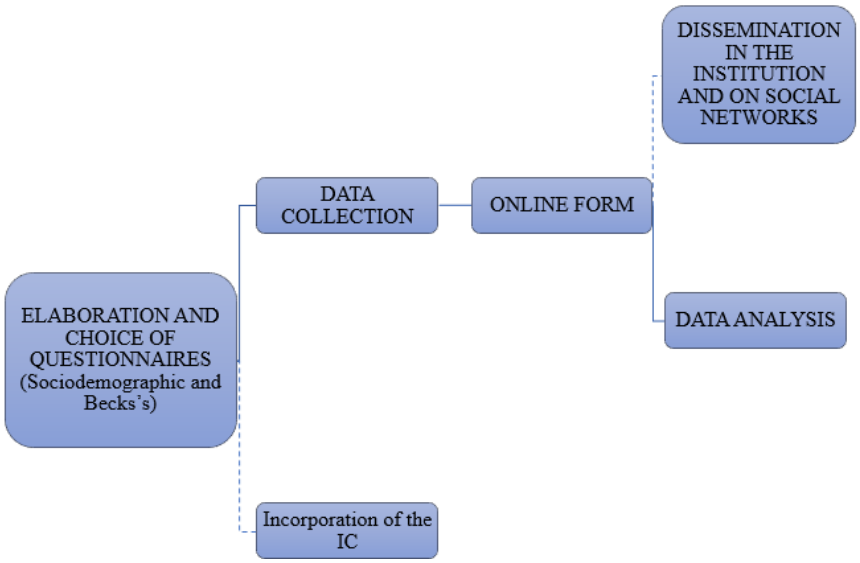

Figure 1. Study design flowchart.
Source: Prepared by the authors (2023).

Data organization and analysis

Data were organized in tables and graphs using Microsoft Excel 2010 software and processed in the 'Statistical Package for the Social Sciences' (SPSS) 20.0 statistical software Data were analyzed in absolute and relative percentages, in addition to mean and median.

Legal ethical aspects

The research complied with the guidelines of Resolution 466/12, which deals with research involving human beings in Brazil and guaranteed respect for the dignity and protection of participants involved in scientific research. Such guarantees were ensured through digital acceptance of the Informed Consent by the participant (Resolução CNS n. 466, 2012). The research began shortly after approval by the participating institution and upon approval by the local Ethics Committee under protocol number CAAE 56365922.9.0000.5210.

Results

Relationship of sociodemographic variables with anxiety and self-medication

According to Table 1, 97 participants were between 16 and 26 years old and had some level of anxiety, being the most affected by this disorder, representing 85% of the total sample obtained; among them, approximately 60 (61.9%) classified themselves as mild or minimal, and 37 (38.1%) were classified as moderate or severe, and who, in turn, did not self-medicate.

In addition, 77 participants (67.5%) were female and 37 (32.5%) were male, in which $p < 0.01$ was found for the relationship between gender and anxiety, showing that females are more predisposed to the disease compared to males, as shown in Table 1.

As for marital status, 18 (15.8%) were in a stable relationship, and 96 (84.2%) lived alone, among the latter, 31 of the respondents in this classification had moderate to high anxiety. Furthermore, 23 (20.2%) work, and 91 (79.8%) of the questioned students do not work, which justifies a larger population with no income.

Regarding children, only 10 (8.8%) participants have children. The opposite is demonstrated about belief, in which 106 people have, and 8 participants do not, which shows that out of the 106 people interviewed, only ± 34.9% may have moderate or severe anxiety, while those who do not have belief have a greater predisposition, i.e. 50%.

In the category of already diagnosed mental disorders, although the number of people in these groups is almost identical, the incidence of moderate and severe anxiety was higher in the group of those with mental disorders, with 32 respondents, representing approximately 31% of the total. Self-medication, in turn,

exposes similar numbers for both groups, since 18 of the participants with mental disorders self-medicate and 16 of those without the disorder use self-medication, regardless of the class of medication used.

Table 1. Perception of anxiety and self-medication concerning sociodemographic variables.

Variables	*N*	Anxiety		*P*	Self-medication		*P*
		Mild/Minimal N	Moderate/Severe N		Yes n	No n	
Age				0.125			0.160
16 – 26	97	60	37		26	71	
27 – 36	11	10	1		6	5	
37 – 44	6	3	3		2	4	
Gender				<0.01			0.673
Female	77	40	37		22	55	
Male	37	33	4		12	25	
Marital status				0.059			0.360
Single/separated/widowed	96	65	31		27	69	
Married/domestic partnership	18	8	10		7	11	
Wok				0.038			0.343
Yes	23	19	4		5	18	
No	91	54	37		29	62	
Income				0.342			0.094
None	66	39	27		14	52	
1 – 6	38	27	11		17	21	
7 – 9	3	3	0		1	2	
> 9 wages	7	4	3		2	5	
Children				0.781			0.461
Yes	10	6	4		4	6	
No	104	67	37		30	74	
Belief				0.391			0.196
Yes	106	69	37		30	76	
No	8	4	4		4	4	
Mental disorder				<0.01			0.774
Yes	58	26	32		18	40	
No	56	47	9		16	40	

Source: Prepared by the authors (2023).

Relationship of academic variables with anxiety and self-medication

According to Table 2, there were 78 (68.42%) responses from participants who were still in the basic cycle. Of these 78 students, 64.1% had mild or minimal anxiety and 35.9% had moderate or severe anxiety. Still considering the program module variable, 80 participants (64.2%) did not self-medicate.

Table 2. Perception of anxiety and self-medication about academic variables.

Variables	*n*	Anxiety			Self-medication		
		Mild/Minimal N	Moderate/Severe N	*p*	Yes n	No n	*p*
Module				0.747			0.263
Basic	78	50	28		24	54	
Clinical	35	22	13		9	26	
Internship	1	1	0		1	0	
Daily study hours				0.867			0.559
0h	77	50	27		21	56	
1 – 6h	31	19	12		12	19	
7 – 9h	5	3	2		1	4	
Above 9h	1	1	0		0	1	
Academic workload				0.685			0.249
0h	29	20	9		5	24	
1 – 6h	62	37	25		22	40	
7 – 9h	21	15	6		7	14	
Above 9h	2	1	1		0	2	
Conducive environment				0.312			0.043
Yes	108	68	40		30	78	
No	6	5	1		4	2	

Link				0.648		0.115
FIES*	18	13	5	2	16	
PROUNI*	19	13	6	7	12	
Scholarship holder	1	1	0	1	0	
Private	76	46	30	24	52	

*programs supported by the Brazilian government.

Source: Prepared by the authors (2023).

Regarding hours of daily study, 77 (67.5%) of respondents had 0 hours, among which 50 (64.9%) had mild or minimal anxiety and 27 (35.1%), had moderate or severe anxiety. Regarding the academic workload, there was a greater number of participants who had 1 to 6 hours, quantified in 62, approximately 54.4% of the total sample, within this amount, 37 (59.7%) participants had mild or minimal anxiety.

As for the conducive study environment, 108 (94.7%) answered that they had it, while 6 (5.3%) did not. And about the link with the college, 76 (66.7%) analyzed participants were from the private category, while 19 (16.6%) had Prouni, 18 (15.8%) had Fies and 1 (0.9%) was a scholarship holder.

Discussion

Admission to higher education is characterized by excessive demand on young people and when entering the medical program, even more responsibility and an exhausting study schedule are required. This overcharging begins during the pre-academic years, which may be responsible for the high rate of psychiatric disorders in medical students. This was reported by Schönhofen, Neiva-Silva, Almeida, Vieira and Demenech (2020), who observed that in up to 80% cases, the selection process is essential for the development of these disorders.

Most respondents who suffer from anxiety are female, 67.5%, indicating a statistically significant relationship, $p < 0.01$, between gender and anxiety symptoms. According to Costa et al. (2019), women can generally be more affected, due to biological and cultural factors, social pressure, and self-demand.

According to Pires and Calil (1999), women, mainly after puberty, present constant hormonal changes and fluctuations. These oscillations can lead to dysphoric mood swings, ranging from depression to anxiety, as well as behavioral changes, such as irritability. Another possible justification cited by Souza and Rezende (2018) is linked to women's exposure to sexuality and sexual violence, leaving them in constant fear and alertness, with very high cortisol, which increases stress and anxiety levels. As evidenced by Ferreira et al. (2009), the culture is still sexist, and for women to achieve social and economic independence, they must face major anxiogenic events.

As demonstrated by Maurya et al. (2021), the increase in self-medication in the world and the facilitated practice are due to economic, political, and cultural factors. It can also be explained by the lack of information about the concept of self-medication on the part of the population, in addition to the greater availability of products on the market, generating greater availability for the lay user. However, the statistic that stood out was in the relationship between self-medication and the conducive environment, once among students who have a favorable environment, only 30 out of 108 used self-medication. This is probably due to greater ease in acquiring medications.

Mental disorders, in general, have a considerable impact in terms of morbidity, impairments in functionality, and a decrease in the quality of life of patients, since approximately 90% mental health problems present manifestations of depression, anxiety, insomnia, fatigue, irritability, memory, and concentration dysfunction. Many patients experience a lowered mood level, reduced energy and activity, and an inability to experience pleasure. Also, women are more susceptible to mood disorders and anxiety (Hiany, Vieira, Gusmão, & Barbosa, 2018).

A recent study by Chopra et al. (2021), whose studied population was in the same similar post-pandemic context due to COVID-19, registered that anxiety levels were more prevalent at mild/minimal levels. These authors also showed that the female population was statistically the most affected. Finally, this study showed that about 25% respondents self-medicated, close to our results, which was 29.8% (34 participants).

Conclusion

Therefore, psychiatric disorders that most affect students are related to academic overload, given that to enter and to remain in higher education, students are charged both by the family and by the school, in addition to the psychological pressure that is imposed on the student to be an excellent professional.

As for the epidemiological profile throughout the study, most of the public suffering from anxiety was female, probably explained by the hormonal and social factors of the Brazilian population in demanding more from women.

Our findings showed no relationship between anxiety and self-medication. These data, however, may not represent reality, because, in contemporary society, access to medication is increasingly easier, leading to self-medication.

Finally, another limitation of the study concerns the sample size, which did not reach the expected number. Working with this modality of disseminating the study and capturing responses proved to be difficult.

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