

The impact of anxiety and depression on migraine patients' journey to a tertiary headache center

Impacto da ansiedade e depressão na jornada dos pacientes com enxaqueca a um centro de cefaleia terciário

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ABSTRACT

Objective: To evaluate the role of psychiatric comorbidity in the number of diagnostic procedures, acute and preventive pharmacological treatments, and non-pharmacological interventions in migraine patients experienced before visiting a tertiary headache center in São Paulo, Brazil. **Methods:** We conducted a retrospective, observational study of 465 consecutive patients diagnosed with migraines and evaluated in a specialized tertiary headache center in São Paulo, Brazil. We collected the data based on medical chart reviews and a self-administered questionnaire routinely performed during the first medical visit. Two standardized instruments were used for the diagnosis of depression and anxiety, respectively: the Patient Health Questionnaire-9 (PHQ-9) and the Generalized Anxiety Disorder (GAD-7). **Results:** We studied 465 patients diagnosed with migraines. The patients' mean age was 37.3 years (313.1), and 72.7% of patients were women. The average age of headache onset was 17.1 years (311.4) before the first appointment at our tertiary headache center, and 51.7% of patients had chronic migraines. Most patients (65.8%) had a PHQ-9 ≥ 5 , indicating at least some depressive symptoms, whereas 152 patients (34.2%) were considered depressed (PHQ-9 ≥ 9). Anxiety symptoms were observed in 68.2% of patients based on the GAD-7 instrument, and 209 patients (47.0%) were diagnosed with anxiety (GAD-7 ≥ 8). Chronic migraines were more common than episodic migraines among patients with psychiatric comorbidity: 63.2% of depressive patients, 61.2% of anxious patients, and 43.5% of patients without any psychiatric disorder. Most patients underwent laboratory tests and brain imaging (62.4% and 70.5%, respectively) in a similar proportion among subgroups with and without anxiety or depression. Non-pharmacological treatment was frequent in all subgroups, and 342 patients (73.5%) performed at least one modality. Overall, acupuncture was the most common non-pharmacological treatment (55.2% of patients), and we found no difference between the subgroups. Depressive and anxious patients more frequently underwent psychotherapy (54.2% and 50.8%, respectively) when compared to patients with neither depression nor anxiety (34.7%). Depression was associated with a reduced likelihood of previous physiotherapy (OR 0.39, CI 0.16 - 0.99). Patients with severe anxiety used 10.7 times more medicines than non-severe patients. **Conclusion:** Depressed patients underwent more psychotherapy than non-depressed patients, although they had a reduced chance of previous physiotherapy. Anxiety was also associated with previous psychotherapy and a risk of 10.7 times of using acute pharmacological treatment, which may lead to issues related to analgesic abuse. Anxiety and depression affect the journey of patients with migraines before arriving at a tertiary headache center.

Keywords: Migraine; Headache; Anxiety; Depression; Psychiatric Comorbidity.

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RESUMO

Objetivo: Avaliar o papel da comorbidade psiquiátrica no número de procedimentos diagnósticos, tratamentos farmacológicos agudos e preventivos e intervenções não farmacológicas em pacientes com enxaqueca experimentados antes de visitar um Centro Terciário de Cefaleia em São Paulo, Brasil. **Métodos:** Realizamos um estudo retrospectivo observacional de 465 pacientes consecutivos diagnosticados com enxaqueca e avaliados em um centro especializado em cefaleia terciária em São Paulo, Brasil. Coletamos os dados com base em revisões de prontuários médicos e em um questionário autoaplicado rotineiramente realizado durante a primeira consulta médica. Dois instrumentos padronizados foram utilizados para o diagnóstico de depressão e ansiedade, respectivamente: o Questionário de Saúde do Paciente-9 (PHQ-9) e o Transtorno de Ansiedade Generalizada (GAD-7). **Resultados:** Foram estudados 465 pacientes com diagnóstico de enxaqueca. A idade média dos pacientes foi de 37,3 anos (3 13,1) e 72,7% dos pacientes eram mulheres. A idade média do início da dor de cabeça foi de 17,1 anos (3 11,4) antes da primeira consulta em nosso Centro Terciário de Cefaleia, e 51,7% dos pacientes apresentavam enxaqueca crônica. A maioria dos pacientes (65,8%) apresentou um PHQ-9 \geq 5, indicando pelo menos alguns sintomas depressivos, enquanto 152 pacientes (34,2%) foram considerados deprimidos (PHQ-9 \geq 9). Os sintomas de ansiedade foram observados em 68,2% dos pacientes com base no instrumento GAD-7, e 209 pacientes (47,0%) foram diagnosticados com ansiedade (GAD-7 \geq 8). As enxaquecas crônicas foram mais comuns que as enxaquecas episódicas em pacientes com comorbidade psiquiátrica: 63,2% dos pacientes depressivos, 61,2% dos ansiosos e 43,5% dos pacientes sem nenhum transtorno psiquiátrico. A maioria dos pacientes foi submetida a exames laboratoriais e imagens cerebrais (62,4% e 70,5%, respectivamente) em proporção semelhante entre os subgrupos com e sem ansiedade ou depressão. O tratamento não farmacológico foi frequente em todos os subgrupos e 342 pacientes (73,5%) realizaram pelo menos uma modalidade. No geral, a acupuntura foi o tratamento não farmacológico mais comum (55,2% dos pacientes), e não encontramos diferença entre os subgrupos. Pacientes depressivos e ansiosos foram submetidos a psicoterapia com mais frequência (54,2% e 50,8%, respectivamente) quando comparados aos pacientes sem depressão nem ansiedade (34,7%). A depressão foi associada a uma probabilidade reduzida de fisioterapia prévia (OR 0,39, IC 0,16 - 0,99). Pacientes com ansiedade grave usavam 10,7 vezes mais medicamentos do que pacientes não graves. **Conclusão:** Pacientes deprimidos foram submetidos a mais psicoterapia do que pacientes não deprimidos, embora tivessem uma chance reduzida de fisioterapia anterior. A ansiedade também foi associada à psicoterapia anterior e a um risco de 10,7 vezes do uso de tratamento farmacológico agudo, o que pode levar a questões relacionadas ao abuso de analgésicos. Ansiedade e depressão afetam a jornada de pacientes com enxaqueca antes de chegarem a um Centro Terciário de Cefaleia.

Descritores: Enxaqueca, Dor de Cabeça, Ansiedade, Depressão, Comorbidade Psiquiátrica.

INTRODUCTION

Migraine is a common chronic neurological disease and a leading cause of disability worldwide, affecting daily and social activities (1). In a study on the global burden of disease, migraine had an average prevalence of 14% and was the second highest contributor of DALYs (disability-adjusted life-years) (2). In Brazil, the population-based prevalence of migraine varies from 10.7% to 22.1% (3), and in tertiary care centers, migraines represent 38% of all headaches (4).

Anxiety and mood disorders are the psychiatric comorbidities most often associated with migraines. These conditions are 2 to 10 times more common in patients with migraines than in the general population, which increases the complexity of their medical management (5, 6). Patients with migraines and comorbid anxiety and/or depression experience higher medical costs when compared to patients with no comorbidities (7) due to resource utilization, including medical visits, diagnostic tests, and therapeutic interventions (8, 9). Additionally, migraineurs are less optimistic and more pessimistic than

non-migraneurs, which may also influence their medical care seeking (10).

Patients with anxiety use health care services for medical consultations, emergencies, and examinations more often than individuals without mental disorders (12.5 3 8.1 vs. 2.4 3 2.6 visits/year) (11). In earlier surveys, anxiety and mood disorders were consistently associated with substantial impairments in both productive roles (e.g., work absenteeism, work performance, unemployment, and underemployment), social roles (e.g., social isolation, interpersonal tensions, and marital disruption) (12, 13), and greater stigma (14). Stigma is a significant aspect of mental and neurological conditions (15). It is a process involving labeling, separation, knowledge and emphasis of stereotypes, prejudice, and discrimination in the context in which power is exercised over disadvantaged members of a social group (16).

Tertiary headache centers usually manage more difficult patients, including those with medical and psychiatric comorbidities (5). Information regarding the patient journey to a specialty headache care center is

limited, and the influence of psychiatric comorbidity on the migraine patient journey is unknown.

In this study, we aimed to assess the role of psychiatric comorbidity on the number of diagnostic procedures, preventive and acute pharmacological treatments, and non-pharmacological interventions migraine patients experienced before visiting a tertiary headache center, in São Paulo, Brazil. We hypothesized that anxiety and depression increase the number of previous diagnostic tests and treatment experiences.

METHODS

Study design

We conducted a retrospective, observational study of 465 consecutive patients with migraine diagnoses based on the International Classification of Headache Disorders – 3rd edition (ICHD-3). The patients were evaluated in a specialized tertiary headache center from March to July 2017, in São Paulo, Brazil. We collected the data through medical chart reviews and a self-administered questionnaire routinely used during initial medical visits. The study was conducted in accordance with local laws and was approved by the local ethics committee.

Eligibility criteria

Inclusion criteria were adult patients of both sexes over 18 years of age who were undergoing initial consultations at a tertiary headache center in São Paulo. Exclusion criteria included patients under 18 years, patients unable to provide reliable information, and patients with significant cognitive deficits or associated dementia.

Patient characteristics

We collected the following patient characteristics: sociodemographic variables, headache characteristics, previous diagnostic methods, clinical history, and treatments previously used. Additionally, we used two standardized instruments to diagnose depression and anxiety, respectively: the Patient Health Questionnaire-9 (PHQ-9) and Generalized Anxiety Disorder (GAD-7).

Instruments and variable definitions

We defined patients with chronic migraines as having headaches more than 15 days per month for at least 3 months; patients with episodic migraines had headaches fewer than 15 days per month.

To evaluate previous diagnostic methods qualitatively, we asked patients if they had undergone at least one of the following: laboratory test, cranial computed tomography, cranial magnetic resonance, electroencephalogram, and polysomnography.

Regarding previous treatments, we asked patients if they had undergone at least one of the following: acupuncture, psychotherapy, physiotherapy, botulinum toxin, meditation, preventive medicines, and acute medicines.

We defined depression based on the Patient Health Questionnaire-9 (PHQ-9), which is designed for use with adults to assess and monitor the severity of depression according to the Diagnostic and Statistical Manual of Mental Disorders (17) and International Classification of Diseases, 10th Edition, diagnostic criteria (ICD-10) (18, 19). The PHQ-9 includes nine items that evaluate symptoms related to depressed mood, anhedonia (loss of interest or pleasure in doing things), problems with sleep, tiredness or lack of energy, change in appetite or weight, feelings of guilt or uselessness, concentration problems, feeling slow or restless, and suicidal thoughts. Final scores are calculated by adding each response (“not at all,” “several days,” “more than half the days,” and “almost every day”) and are classified into five depression severity groups: 0-4: none; 5-9: mild; 10-14: moderate; 15-19: moderately severe; 20-27: severe. However, based on a previous Brazilian study that defined a score of 9 as the best point of accuracy, and to assess depression as a dichotomized variable, we divided the patients into two groups: with depression if their PHQ-9 scores were greater than or equal to 9, and without depression if their scores were less than 9 (20).

Anxiety was defined based on the Generalized Anxiety Disorder (GAD-7) scale, which consists of seven items arranged on a 4-point Likert scale (0: not at all; 1: several days; 2: more than half the days; 3: nearly every day). Final scores are divided into four groups: 0-4: minimal or no anxiety; 5-9: mild; 10-14: moderate; 15-21: severe. (21). In our study, we consider a GAD-7 score greater than or equal to 8 an anxiety diagnosis.

Statistical analysis

For subgroup comparison in a univariate analysis, we used the chi-square test or Fisher’s exact test. To identify variables independently related to depression and anxiety symptoms, we categorized patients in four steps. Initially, we defined two groups: patients with depression and patients without depression. Next, we performed a logistic regression to identify association of previously performed exams and previously used treatments with both groups. We then categorized patients as having anxiety or not, and performed a new logistic regression to study the same variable’s association with anxiety. Finally, we performed a third logistic analysis to consider the severe anxiety and severe depression subgroups. We used IBM SPSS Statistics version 25 software (IBM, Armonk, New York, USA) and considered a two-sided $P < 0.05$ statistically significant.

RESULTS

Sample characteristics

We studied 465 patients with migraine diagnosis; their characteristics are summarized in Table 1. Their mean age was 37.3 years (313.1), and 72.7% of patients were women. The patients’ average age at headache onset was 17.1 years (311.4) before the first appointment

Table 1. Patients characteristics with migraine.

Sociodemographic and clinical characteristics	N or years	% or SD
Age (Mean 3 SD, n=462)	37.3	13.1
Duration of migraine in years (Mean 3 SD, n=462)	17.2	11.4
Gender (n=462)		
Men	126	27.3
Women	336	72.7
Religion (n=239)		
Yes	204	85.4
Without religion	35	14.6
Migraine type		
Chronic	240	51.7
Episodic	224	48.3
Patient Health Questionnaire - 9 (PHQ-9) (n=445)		
Minimal or none (score 0-4)	152	34.2
Mild (score 5-9)	152	34.2
Moderate (score 10-15)	75	16.9
Moderately severe (score 15-19)	35	7.9
Severe (score 20-27)	31	7.0
General Anxiety Disorder - 7 (GAD-7) (n=445)		
None (score 0-4)	139	31.2
Mild (score 5-9)	144	32.4
Moderate (score 10)	93	20.9
Severe (score 15-21)	69	15.5
Final mood diagnosis (n=445)		
Depression (PHQ-9≥9)	152	34.2
Anxiety (GAD-7≥8)	209	47.0
Depression and anxiety (PHQ-9≥9 and GAD-7≥8)	131	28.2
No depression or anxiety (PHQ-9<9 and GAD-7<8)	237	50.9
Medical comorbidities (n=465)		
Rhinitis	180	50.7
Sinusitis	175	49.3
Gastritis	173	48.7
Kidney stone	66	18.6
Polycystic ovary	58	16.3
Hypertension	39	11.0
Endometriosis	22	6.2
Fibromyalgia	21	5.9
Any medical comorbidities (n=465)	355	76.3
Tabacco use (n=435)	30	6.5
Alcohol use (n=465)	214	46.0

SD: Standard deviation.

at our tertiary headache center, and 51.7% of patients had chronic migraines.

Most patients (65.8%) had a PHQ-9 ≥ 5, indicating at least some depressive symptoms, whereas 152 patients (34.2%) were considered depressed (PHQ-9 ≥ 9) (Table 1). Symptoms of anxiety were observed in 68.2% of patients, based on their GAD-7 scores, and 209 patients (47.0%) were diagnosed with anxiety (GAD-7 ≥ 8). Depression and anxiety were simultaneously diagnosed in 131 patients (28.2%), and 237 patients (50.9%) had neither anxiety nor depression. Other self-reported medical conditions were common: 76.3% of patients had comorbidities, such as gastritis, sinusitis, hypertension, kidney stones, fibromyalgia, and polycystic ovarian syndrome (Table 1).

We divided the patients into 4 subgroups: depression, anxiety, depression and anxiety, and neither depression nor anxiety. The characteristics evaluated in comparison were migraine type, previous diagnoses methods, and previous non-pharmacological and pharmacological treatments.

Chronic migraines were more common than episodic migraines among patients with psychiatric comorbidities: 63.2% of depressive patients, 61.2% of anxious patients, and 43.5% of patients without any mood disorder experienced chronic migraines (Table 2).

Most patients underwent laboratory tests and brain imaging (62.4 and 70.5%, respectively) in a similar proportion among subgroups with or without anxiety or depression (Table 2). One-third of patients underwent an electroencephalogram before first evaluation (Table 2).

Non-pharmacological treatment was frequent in all subgroups, and 342 patients (73.5%) performed at least one modality. Overall, acupuncture was the non-pharmacological treatment most commonly done (55.2% of patients) without difference between all subgroups. Depressive and anxious patients (54.2% and 50.8%, respectively) more frequently underwent psychotherapy compared to patients with neither depression nor anxiety (34.7%) (Table 2). We found no differences among the subgroups for other treatment modalities, such as physiotherapy, botulinum toxin, nerve blocks, and meditation.

Regarding pharmacological treatments, most patients in all subgroups used preventive and acute treatments (Table 2), although the proportion of acute medicine usage was slightly higher than that of preventive medicine, even in subgroups with mood disorders. Depressed patients took preventive medications more often compared to non-depressed patients (67.1% vs. 59.8%).

Multivariate analysis

Logistic regression was performed to identify factors associated with depression and anxiety. Depressed patients were more likely to be female (OR 8.18, CI 2.82 – 23.75), had more chronic migraines (OR 4.25, 1.90-9.50), and had undergone more psychotherapy (OR 2.56, CI 1.15 – 5.66) than non-depressed patients (Table 3). In addition, depression was associated with a reduced likelihood of having previously undergone physiotherapy (OR 0.39, CI 0.16 – 0.99). Anxiety was also associated with female gender (OR 3.07, CI 1.36 – 6.95), chronic migraines (OR 3.91, CI 1.90 – 8.04), and previous psychotherapy (OR 2.18,

Table 2. Comparison based in the presence of anxiety and depression

Patients (n=465)	Depression (D)		Anxiety (A)		D + A		Without D or A		All patients	
	N= 152		N=209		N=131		N=237		N=465	
	N	%	N	%	N	%	N	%	N	%
Migraine Type*										
Chronic	96/152	63.2	128/209	61.2	84/131	64.1	103/237	43.5	240	51.7
Episodic	56/152	36.8	81/209	38.8	47/131	35.9	134/237	56.5	224	48.3
Previous test										
Laboratory tests	100/152	65.7	134/209	64.1	86/131	65.6	156/237	65.8	290	62.4
Cranial CT	92/152	60.5	130/209	62.2	85/131	64.9	130/237	54.9	260	55.9
Cranial MRI	94/152	61.8	126/209	60.3	84/131	64.1	133/237	56.1	259	55.7
Cranial CT or MRI	112/152	73.7	154/209	73.7	98/131	74.8	168/237	70.9	328	70.5
EEG	57/152	37.5	80/209	38.3	49/131	37.4	83/237	35.0	163	35.1
Non-pharmacological treatments										
Any non-pharmacological	119/152	78.3	164/209	78.5	105/131	80.2	178/237	75.1	342	73.5
Acupuncture	81/141	57.4	117/196	59.7	73/122	59.8	116/226	51.3	233	55.2
Psychotherapy*	77/142	54.2	100/197	50.8	70/123	56.9	78/225	34.7	178	42.2
Physiotherapy	39/141	27.7	60/196	30.6	32/122	26.2	69/223	30.9	129	30.8
Botulinum Toxin	22/141	15.6	31/196	15.8	21/122	17.2	36/225	16.0	67	15.9
Nerve Blockade	35/141	24.8	44/196	22.4	28/122	23.0	47/224	21.0	91	21.7
Meditation	19/141	13.5	34/196	17.3	16/122	13.1	41/225	18.2	75	17.8
Pharmacological treatments										
Preventive medicines	102/152	67.1	132/209	63.2	84/122	64.1	144/235	61.3	276	59.6
Acute medicines	103/152	67.8	139/209	66.5	88/131	67.2	150/235	63.8	289	62.4

* numbers in bold present results with difference statistically significant (p<0.05). D: Depression; A: Anxiety.

Table 3. Multivariate analysis for presence of depression

Variables	B	Wald	OR	95% Confidence interval	p-value
Age (years)	-0.05	5.34	0.95	0.92 - 0.99	0.021
Female	2.10	14.95	8.18	2.82 - 23.75	0.000
Having religion	0.60	1.41	1.82	0.68 - 4.88	0.235
Disease duration (years)	0.03	2.05	1.03	0.99 - 1.08	0.152
Chronic migraine	1.45	12.48	4.25	1.90 - 9.50	0.000
Alcohol use	0.49	1.62	1.63	0.77 - 3.46	0.202
Tobacco use	0.40	0.35	1.48	0.40 - 5.47	0.552
Presence of any comorbidity	0.35	0.46	1.42	0.51 - 3.92	0.499
Cranial MRI	0.44	1.04	1.55	0.67 - 3.60	0.308
Cranial CT	-0.13	0.09	0.88	0.39 - 1.99	0.759
Laboratory tests	-0.06	0.02	0.94	0.42 - 2.10	0.877
EEG	.014	0.11	1.16	0.50 - 2.69	0.737
Acupuncture	0.06	0.03	1.07	0.49 - 2.31	0.869
Psychotherapy	0.94	5.34	2.56	1.15 - 5.66	0.021
Physiotherapy	-0.92	3.97	0.40	0.16 - 0.99	0.046
Botulinum toxin	0.29	0.30	1.34	0.47 - 3.78	0.582
Nerve Blockade	-0.39	0.66	0.67	0.26 - 1.74	0.417
Meditation	-0.82	2.77	0.44	0.17 - 1.16	0.096
Preventive medicines	-0.71	2.16	0.49	0.19 - 1.27	0.141
Acute medicines	0.41	0.83	1.51	0.62 - 3.67	0.362

* numbers in bold present results with difference statistically significant (p<0.05)

CI 1.07 - 4.47). In addition, anxious patients were less likely to undergo laboratory tests (OR 0.40, CI 0.19 - 0.85).

Furthermore, we performed a logistic regression to determine whether severe depression (65 patients) and severe anxiety (69 patients) were associated with the same variables. We found that severe depression was also associated with chronic migraines (OR 4.72, CI 1.53 - 14.56) and female gender (OR 4.62, CI 1.3-18) and tended to be associated with previous psychotherapy (OR 2.72, CI 0.96-7.69). The inverse relationship between depression and previous physiotherapy was not found in the severe group. Severe anxiety was also associated with fewer laboratory tests (OR 0.23, CI 0.09 - 0.60) and chronic migraines (OR 3.15, CI 1.20 - 8.23). In addition, we found that severe anxiety patients used 10.7 times more acute medication than non-severe anxiety patients (OR 10.71, CI 2.60 - 44.08).

DISCUSSION

In our study of migraine patients at a tertiary headache center, we found depressive symptoms in 65.8% of patients and a depression prevalence of 34.2%. The prevalence of anxiety was 47.0%, whereas 68.2% of patients had some anxiety symptoms. Anxiety and depression were present simultaneously in 28.2% of patients, (Table 1) and these conditions were strongly associated with chronic migraines and female gender. These results align with recent studies that reported high prevalence of the same psychiatric comorbidities in patients with chronic migraines (1, 5, 6, 22, 23). The analysis of previous patient journeys showed that depressive patients underwent more psychotherapy and less physiotherapy than non-depressed patients, whereas anxiety was associated with a higher probability of undergoing psychotherapy, but a lower probability of undergoing laboratory tests. Additionally, severe anxiety increased the risk of using acute medication by 10.7 times. Patients with migraines frequently have multiple medical visits before arriving at a tertiary center. Reported on primary care provided by non-specialists and found that headache patients had an average of 3 health care providers prior to consultation with a specialist, with an average of 11 years of pain duration (24). In our tertiary headache center, the mean headache duration was 17.1 years (311.4) before the first appointment, and most patients had already performed non-pharmacological treatments and used preventive medicine. Therefore, considering the high prevalence of mood symptoms in migraineurs, non-specialists should be trained in the management of psychiatric comorbidities in headache disorders to improve the patient journey.

Regarding ancillary tests performed during headache diagnosis, cranial computed tomography and magnetic resonance imaging permit the exclusion of certain secondary causes of headaches, such as brain masses and vascular diseases, but their usefulness is significantly reduced in patients with chronic headaches. We consider the previous cranial imaging undergone by 70% of our patients to be quite unwarranted, as is the high frequency of previous Electroencephalogram

(EEG) (one-third of our patients had undergone at least one), which is usually unnecessary for migraine patients. A detailed evaluation of other symptoms indicative of secondary headaches should always be considered, so excessive and costly tests may be precluded in patients with evident migraine criteria unless other warning signs are present (25).

We expected more migraine patients with psychiatric comorbidities to have undergone diagnostic tests than those without comorbidities, as observed in previous reports (5, 26), but our study did not confirm these findings. This could be due to a trend among primary physicians of asking tests for most headache patients, regardless of psychiatric comorbidities. Another explanation is the fact that we did not quantify the number of tests performed, but asked the patients if they underwent a specific test at least once in the past. In addition, stigma may be an issue, as patients with anxiety or depression may not be evaluated adequately and may give up seeking a correct diagnosis. A finding that supports this hypothesis is that anxious patients in our study were less likely to undergo laboratory tests, although one would predict the opposite due to increased somatization and physical symptoms.

Non-pharmacological treatment was frequent; patients in all subgroups performed at least one modality. Interestingly, previous experience with psychotherapy was frequently a predictor of anxiety and depression in migraine patients. This could be explained by previous referrals from physicians or self-referrals to psychotherapy. More severe patients should have greater need for medication and non-pharmacological approaches, but in this case, we found only psychotherapy and, interestingly, reduced odds of undergoing physical therapy. The low probability of undergoing physical therapy could be due to kinesiophobia, a phenomenon related to the avoidance of physical therapy in the treatment of chronic pain, in patients with depression and anxiety (26, 27). Besides the overuse of health care services, anxiety and depression are both associated with significant psychological distress and poor health perception, whereas physical disability is only associated with depression and may corroborate the kinesiophobia (28).

We found no independent association between depression and a higher likelihood of using pharmacological treatment. One explanation for this lack of correlation may be the way we verified the use of medication. In our study, we did not quantify the number or duration of drugs previously tried, but evaluated these factors qualitatively (used or not used). However, we found a strong association between severe anxiety and acute medicine consumption. Higher anxiety levels could cause patients to seek more care and receive more preventive treatments, but patients may also use analgesics excessively due to cephalgiaphobia, anticipatory anxiety, or compulsion (29). Severe anxiety patients used 10.7 times more acute medicines than non-severe anxiety patients. This is also in accordance with other studies' findings. Showed that analgesic consumption was greater in GAD patients with primary

headaches than in controls with primary headaches without GAD (11). Analgesics ingestion can occur prior to the onset of a headache due to anxiety, and evaluated the reasons for this behavior: 67% of patients reported difficulty coping with pain, 62% feared its emergence, and 45% consumed analgesics to reduce anxiety (30).

Our study has some limitations. First, it was an observational cross-sectional study based on medical charts and a retrospective self-reported questionnaire, so associations found may be not due to a cause-effect relationship. Second, patients were asked to remember all previously performed procedures, which can be influenced by reminder bias. Finally, we performed a single-center study. Thus, our study reflected a specific population, and selection bias may have influenced our results.

CONCLUSION

Anxiety and depression were common in migraine patients seen at a tertiary headache center, mostly in patients with chronic migraines. Depressed patients were often female, had more chronic migraines, and had undergone more psychotherapy than non-depressed patients, although they had a reduced chance of having previously undergone physiotherapy. Anxiety was also associated with female gender, chronic migraines, previous psychotherapy, and a risk of using acute pharmacological treatment that was 10.7 times higher than in other patient groups, which may lead to issues related to analgesic abuse. Anxiety and depression affect the journey of patients with migraines, probably beginning with primary care, and physicians, who routinely offer first-aid interventions, should be concerned with recognizing these mental disorders.

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