

Prevalence of anxiety in patients admitted to a university hospital in southern Brazil and associated factors

Prevalência de ansiedade em pacientes internados num hospital universitário do sul do Brasil e fatores associados

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Abstract

Objective: To identify the prevalence of anxiety in adults hospitalized in the clinical ward of a university hospital and to analyze the possible associated factors. **Method:** A cross-sectional study was performed in a university hospital. All interviewees answered a specific questionnaire and the Hospital Anxiety and Depression Scale. A Poisson regression was used to calculate prevalence ratios with 95% confidence intervals. **Results:** 282 patients were enrolled. The prevalence of anxiety was 33.7% (95%CI 28.2 – 39.3). Characteristics associated with the outcome were female gender (RP 2.44), age \geq 60 years (PR 0.65), consultation in primary health care (PR 2.37), estimated time of contact between patient and student $>$ 30 min (RP 1.36), high blood pressure (PR 1.57), diabetes mellitus (PR 1.43), and obesity (RP 1.43). **Conclusion:** This study found prevalence of high anxiety. It may be associated with certain characteristics of the patients (gender, age, chronic diseases); the medical appointment in primary care and time (estimated by the patient) that the student remained with this patient. The need for a focused approach to mental health care within the hospital has been discussed for a long time. The particularity of this study refers to the environment of a university hospital and to what extent the environment and the patient's relationship with the student are associated with higher prevalence of anxiety.

Keywords: Anxiety. Prevalence. University Hospitals. Hospital care. Hospitalization. Inpatients.

Resumo

Objetivo: Identificar a prevalência de ansiedade em adultos hospitalizados na enfermaria de clínica médica de um hospital universitário e analisar seus possíveis fatores associados. **Método:** Estudo transversal realizado em hospital universitário, mediante a aplicação de instrumento específico e a Hospital Anxiety and Depression Scale. Foi realizada a regressão de Poisson para o cálculo das Razões de Prevalência com Intervalos de Confiança 95%. **Resultados:** Participaram 282 pacientes. A prevalência de ansiedade encontrada foi de 33,7% (IC95% 28,2 – 39,3). Mostraram-se associadas à ansiedade o gênero feminino (RP 2,44), a idade \geq 60 anos (RP 0,65), consulta habitual na atenção primária (RP 2,37), estimativa do paciente sobre o tempo que o aluno permaneceu com ele $>$ 30 min (RP 1,36), a hipertensão arterial sistêmica (RP 1,57), a diabetes mellitus (RP 1,43) e a obesidade (RP 1,43). **Conclusão:** O presente estudo encontrou uma prevalência de ansiedade elevada. Essa pode estar associada a algumas características do paciente (gênero, idade, doenças crônicas), à consulta habitual em atenção primária e ao tempo (estimado pelo paciente) que o aluno permaneceu com esse enfermo. A necessidade de uma abordagem voltada à saúde mental no âmbito do atendimento hospitalar já vem sendo discutida há muito tempo. A particularidade do presente estudo refere-se ao ambiente de um hospital universitário e em que medida este ambiente e a relação do paciente com o aluno associam-se a uma maior prevalência de ansiedade.

Palavras-chave: Ansiedade. Prevalência. Hospitais Universitários. Assistência hospitalar. Hospitalização. Pacientes Internados.

Introduction

Anxiety is a universal experience that appears in response to demands or threats as a sign of search for adaptation¹. It can be considered pathological when representing a response that does not properly correspond to a stimulus, in a way that the individual experiences insecurity, goes through apprehensive anticipation, finds difficulties to adjust to the environment and presents signals of suffering². The hospital scope increases the possibility to trigger the anxiety among patients³, which disturbs and limits the patient in terms of facing his or her condition; as to the doctor, it may make diagnosis and treatment more difficult⁴. The exposure of intimacy to strangers, the contact with other people with situations of illness and the uncertainty toward the evolution of the treatment can also become highly anxiogenic⁵. In these cases, usually the occurrence of inexplicable physical symptoms increases, and the time of hospitalization prolongs significantly⁶.

Prevalence surveys show that 20 to 60% of inpatients in general hospitals suffer from some sort of psychiatric disorder, and depressive and anxiety disorders are amongst the most common ones. The variation of these ciphers depends on the studied population and methodological definitions⁷. Depending on the unit where the patient is located, or on the comorbidities that he or she presents, there are different levels of anxiety. The high prevalence (around 65%) was related to patients in preoperative or those with chronic pain^{8,9}. Other situations, like the fact of being unemployed, are related to higher levels of anxiety during hospitalization⁸. The female gender proved to be associated with higher levels of anxiety during hospitalization in relation to the opposite gender¹⁰.

Despite causing considerable pain and clinical implications, it is estimated that only 35% of them receive specialized care in mental health. Besides, many symptoms can be a result both of the organic and the mental pathology, leading to confusion in the diagnosis⁷.

Concerning the variables associated with anxiety in hospitalized patients, the found studies prioritized the matter of sociodemographic aspects and comorbidities. Other factors that may be associated have not been explored yet. For instance, there is lack of studies clarifying the variables associated with anxiety in patients hospitalized in a university hospital with their particular characteristics, such as the presence and time of permanence of students, as well as variables related to habits, costumes, and chronic comorbidities, among others. Therefore, this study aimed at identifying the prevalence of anxiety in adults admitted to the clinical ward of a university hospital and at analyzing its possible associated factors, thus contributing for the full care for the inpatient.

Methodology

Design and location

It was a cross-sectional study conducted with the patients in the clinical ward of university hospital Dr. Miguel Riet Corrêa Júnior. This public school hospital is part of Universidade Federal do Rio Grande (FURG), located in the city of Rio Grande, state of Rio Grande do Sul.

Participants

Participants were the inpatients of the referred hospital located in the clinical ward from September 2010 to January 2011. The sample was composed of patients aged more than 18 years old, of both genders, with minimum admission time of 48 hours. Exclusion criteria included patients with difficulties to answer the questionnaire properly, such as the ones with hearing, speech or mental impairment. In order to calculate the prevalence sample, a 95% confidence level was used, as well as estimates of prevalence of anxiety of 40% (\pm 6%), accounting for 282 patients, with the addition of 10% of loss prediction.

Instruments

The used instrument was a pre-codified questionnaire with the following independent variables: a) sociodemographic (age, gender, self-declared skin color, marital status, income, work situation, schooling, religion); b) habits and costumes (alcohol consumption, smoking, physical activity); c) health behavior (if the person frequently sees a doctor when feeling sick, where they go to, since when do they see this doctor); d) hospitalization and medical history — data collected from medical records — (time of hospitalization, previous admission in the past year, classes and number of prescribed medicines, typology and number of chronic diseases); e) assessment of the patient with regard to the presence and time of stay of students. These variables were assessed by means of a dichotomous question (*In this hospitalization period, has any nursing/medical student come to examine/talk to you?*) and an open question (*In average, how long has the student stayed with you in each opportunity?*).

In order to check the habit of alcohol consumption, the CAGE¹¹ and AUDIT¹² questionnaires were used. Both are validated in Brazil and do not require authorized training to be used. CAGE has four questions and the cutoff point is considered as two affirmative answers, suggesting positive screening for alcohol abuse or dependence¹³. AUDIT is comprised of ten questions, and the score reached by the individual after answering the items enables the classification as to the use of the substance as follows: Zone I (low risk): 0 to 7 points; Zone II (use of risk): 8 to 15 points; Zone III (harmful use): 16 to 19 points; Zone IV (probable dependence): 20 to 40 points¹⁴. To analyze the habit of smoking, besides the direct question (*do you smoke?*), the Fagerström test for nicotine dependence was also used. It is a worldwide validated and used test that functions as an assessment tool consisting of a questionnaire with six questions. It is possible to reach the maximum score of 10

points. More than six points indicate that, most likely, the patient presents high risk of nicotine dependence¹⁵.

For the anxiety closure, the Hospital Anxiety and Depression Scale (HADS) was used. Its version in Portuguese has been tested and validated among inpatients⁷. In the construction of HADS, the vegetative symptoms that may occur in physical conditions were prevented; therefore, it is especially useful to assess mood disorders in situations of hospitalization. The HAD scale contains 14 multiple-choice questions and consists of two sub-scales: anxiety and depression, with seven items each. The global score for each sub-scale ranges from 0 to 21 points. In this study, the anxiety sub-scale was assessed, and the considered cutoff point was ≥ 9 points¹⁶.

After the conduction of the pilot study, the instrument was applied by three medical students attending the tenth semester. Interviewers followed-up the hospitalizations and hospital discharges daily, thus avoiding losses.

Data analysis

For purposes of quality control, 10% of the interviewees were revisited. Some of the questions from the original instrument were applied again in order to study test-retest reliability, and for such end the Kappa index was calculated.

The codified data were inserted in Epiinfo 6.04d, by two independent typists, and afterward the data cleansing process took place, considering errors of amplitude and consistency.

Statistical analysis was processed in three phases. In the descriptive phase, central and dispersion measurements were calculated for numerical variables and, in case of categorical variables, the respective proportions were calculated. For the outcome, the prevalence and the 95% confidence interval (95%CI) were calculated. In the second phase, the association between the studied factors and the outcome was analyzed with the chi-square test (or Fisher's exact test) for categorical variables,

and Student's t-test was used for continuous variables. In the third phase, in order to explore the independent effect of variables, the choice was to use the Poisson regression with large confidence intervals. This type of regression enables to calculate prevalence ratios, and it is also adequate to measure the association between factors and outcome in cross-sectional studies. The variables inserted in the model should have obtained $p \leq 0.2$ in the bivariate analysis, except for the sociodemographic variables that were included regardless of value. The regression was performed with the use of a hierarchic analysis model in four levels¹⁷. Variables in each level were included in blocks, and their permanence inside the model was conditioned to $p \leq 0.2$. The variables of each level that met this criterion were adjusted with the following level until completing all the four levels (Figure 1). Prevalence Ratios (PR) and 95%CI were calculated for the different factors analyzed with regard to the outcome. The regression was "backwards". PR and 95%CI were estimated for each level, and statistical significance was assessed with the Wald test. When variables were ordinal, with three or more categories, and also when a linear trend was observed, the choice was to use the Wald test for linear trend. In the case of ordinal variables with no linear trend, the heterogeneity test was used. In all of the analyses, the cutoff point was bicaudal $p < 0.05$.

Ethical aspects

This study was approved by the Research Ethics Committee in the Health Field of Universidade Federal do Rio Grande (report n. 78/2010). Before answering the questionnaires, participants were asked to sign the informed consent form. The doctors in charge were warned about the interviewers about the patients who presented with positive tests for the outcome. The authors declared there were no conflicts of interest.

Results

At the end of the study, 284 patients were selected; there were two refusals



Figure 1 - Hierarchical model analysis.
Figura 1 - Modelo de análise hierárquica.

(0.7%), therefore, the sample consisted of 282 patients. Quality control for the Kappa parameter showed agreement higher than 0.85 for the studied variables. The prevalence of anxiety among inpatients in the clinical ward was of 33.7% (95%CI 28.2 - 39.3).

In the descriptive analysis (Table 1), sociodemographic data revealed that mean age was of 53.1 years old (SD 15.9) and ranged from 18 to 84 years old. Most of them are white (68.44%), male (50.35%) and lived without a partner (50.35%). Mean per capita income was of R\$ 435.50 (SD R\$ 357.90). Most of the patients were out of work (67.37%). Most were literate (84.40%), however, only 25.90% had concluded elementary school. Concerning habits and costumes, there was high prevalence of smokers, high rates of alcohol use and abuse and a few patients self-declaring the practice of regular physical activities. More than one third of the patients had been

hospitalized in the previous year; most of the interviewees had been previously diagnosed with some chronic pathology, and Systemic Arterial Hypertension (SAH) was the most mentioned one, followed by gastrointestinal and respiratory conditions. The matter related to the presence of a reference doctor who they go to when feeling sick obtained 65.50% of affirmative answers and, out of these, 84.86% usually attend some sort of public service. The mean time since patients have seen this professional was 7.34 years (SD 6.18 years). Days of hospitalization ranged from 2 to 85 days (mean: 10.28, SD 9.52 days). In the admission medical prescription, 11.35% of them had more than 8 classes of medication. The most prescribed one was that of painkillers (84%). The prescription of anxiolytics and antidepressants was much less expressive (15.60 and 10.65%, respectively). Most patients had been examined/interviewed by students.

In Tables 2 and 3, the distribution of anxiety according to associated factors is observed. Concerning the sociodemographic characteristics, only gender showed a statistically significant relation. No significant results were obtained for the variables concerning habits and costumes. The number and some types of pre-existing chronic pathologies were associated with the outcome. With regard to current hospitalization and number of classes of prescribed medicines, the anxiolytic class and the estimated time of stay of the graduate student were significant.

The multivariate phase of the analysis (Table 4) revealed that the female gender in this study is associated with the anxiety of hospitalized patients. Concerning age, there is significant association, with lower prevalence among the older patients. As to the place they usually attend in terms of health care, it was observed that appointments conducted in Primary Health Care (PHC) and the Emergency Room (ER) were those with higher prevalence ratios. Chronic diseases associated with anxiety were Diabetes Mellitus (DM), SAH and

Table 1 - Description of the sample. University Hospital Dr. Miguel Riet Corrêa Jr., Rio Grande, Rio Grande do Sul, 2011 (n = 282).

Tabela 1 - Descrição da amostra estudada. Hospital Universitário Dr. Miguel Riet Corrêa Jr., Rio Grande, Rio Grande do Sul, 2011 (n = 282).

Variable	n (%)
Gender	
Female	140 (49.6)
Male	142 (50.4)
Color	
White	193 (68.4)
Nonwhite	89 (31.6)
Religion	
Yes	220 (78)
Marital status	
Without a partner	142 (50.4)
With a partner	140 (49.6)
Age	
18 – 39 years	63 (22.4)
40 – 59 years	111 (39)
≥ 60 years	108 (38.6)
Schooling	
≥ 8 years	73 (25.8)
Labor activity before hospitalization	
Did not have	36 (12.8)
Was retired/pensioner	154 (54.6)
Yes, did work	92 (32.6)
Income (reais) in quartiles (mean ± SD)	
1	122.73 ± 80.82
2	285.94 ± 34.11
3	479.75 ± 51.04
4	873.33 ± 447.53
Smoker	
Yes	98 (34.7)
Fageström scale	
≥ 6 points	52 (53)
AUDIT	
≥ 8 points	43 (15.3)
CAGE	
≥ 2 affirmative answers	26 (9.2)
Regular physical activity	
Yes	50 (17.7)
Consult with a reference doctor when necessary	
Yes	185 (65.6)
Place of appointment with this doctor	
PHC	71 (38.4)
Outpatient clinic FURG	63 (34)
Emergency room	15 (8.1)
Another public place	8 (4.4)
Private	28 (15.1)
Presence of chronic pathologies	

Table 1 - Continuation.**Tabela 1 - Continuação.**

Variable	n (%)
Yes	227 (80.5)
Type of chronic pathology	
SAH	96 (34)
DM	49 (17.4)
HIV	36 (12.8)
Obesity	21 (7.5)
Cancer	11 (3.9)
Autoimmune disease	13 (4.6)
Heart	56 (19.9)
Respiratory	65 (23)
Thyroidopathy	13 (4.6)
Gastrointestinal	65 (23)
Psychiatric	7 (2.5)
Renal	10 (3.6)
Admission in the past 12 months	
Yes	107 (38.3)
Days of current hospitalization	
Mean \pm SD	10.28 \pm 9.52
Number of classes of prescribed medications	
\geq 4 classes	226 (80)
Class of prescribed medication	
Painkillers	237 (84)
Antidepressants	30 (10.64)
Anxiolytics	44 (15.60)
Presence of the student	
Yes	205 (72.6)
Up to 10 min	19 (9.0)
11 – 20 min	82 (40.2)
21 – 30 min	56 (27.6)
> 30 min	48 (23.1)

obesity. There was a significant association with regard to the variable “estimate of the patient about the time the student stayed with him/her”. The PR variation, in relation to the stratified time intervals, showed a “U” pattern, that is, the association is higher in time extremes and lower in middle categories in relation to those who did not have the presence of the students.

Discussion

This study found a prevalence of anxiety of 33.7% (95%CI 28.2 – 39.3) among

inpatients in the clinical ward of a general university hospital. In literature, such prevalence is found at an intermediate rate when compared to data found in other studies. In case of a study conducted in a hospital of Minas Gerais, the proportion of 46% was found³, however, this study was developed with inpatients in several and distinct wards. A Chilean study pointed out to the prevalence of 28.9% among inpatients of internal medicine¹⁰, using another instrument to assess the prevalence of anxiety. In Brazil, a study conducted to validate the HADS scale, in 1995, obtained

Table 2 - Distribution of anxiety according to socio demographic characteristics. Universit Hospital Dr. Miguel Riet Corrêa Jr., Rio Grande, Rio Grande do Sul, 2011 (n = 282).

Tabela 2 - Distribuição da ansiedade segundo características sociodemográficas. Hospital Universitário Dr. Miguel Riet Corrêa Jr., Rio Grande, Rio Grande do Sul, 2011 (n = 282).

Variable	Without anxiety % (187)	With anxiety % (95)	p-value
Gender			
Male	80.28 (114)	19.72 (28)	0.001 ^a
Female	52.18 (73)	47.82 (67)	
Color			
White	65.28 (126)	34.72 (67)	0.59 ^a
Nonwhite	68.54 (61)	31.46 (28)	
Religion			
Yes	64.94 (113)	35.06 (61)	0.81 ^a
No	67.74 (42)	32.26 (20)	
Marital status			
Yes, but not practicing	69.57 (32)	30.43 (14)	0.64 ^a
Without a partner	67.61 (96)	32.39 (46)	
With a partner	65 (91)	35 (49)	
Categorized age			
18 – 39 years	58.73 (37)	41.30 (26)	0.06 ^b
40 – 59 years	64.55 (71)	35.50 (39)	
≥ 60 years	72.2 (78)	27.80 (30)	
Schooling			
≥ 8 years of study	68.49 (50)	31.51 (23)	0.64 ^a
Work activity before hospitalization			
No	63.89 (23)	36.11 (13)	0.85 ^a
Retired/pensioner	65.58 (101)	34.42 (53)	
Yes	68.48 (63)	31.52 (29)	
Income in quartiles			
1	65.75 (48)	34.25 (25)	0.076 ^a
2	58.82 (40)	41.18 (28)	
3	78.08 (57)	21.92 (16)	
4	61.76 (42)	38.24 (26)	

^aChi-square test; ^bTeste de heterogeneidade.

^aQui quadrado; ^bHeterogeneity test.

20.5%⁷. This difference found in the studies between the levels of prevalence of anxiety is probably a reflex of the employment of different methodologies, as well as the differences between the analyzed samples.

In relation to gender, this study found higher prevalence among women, with significant association and PR = 2.44 (95%CI 1.68 – 3.56). In previous studies conducted with inpatients, there were similar prevalence results^{7,3,10}. The prevalence of women amongst patients with depressive or anxiety disorders was confirmed by specialized scientific literature^{18,19}.

Schooling and income seem to be associated with anxiety. In a research conducted in the USA, with people in the community aged more than 55 years old, it

was observed that anxiety inversely varied according to educational levels and socio-economic status²⁰. However, in this study, in a hospitalized population with similar socioeconomic conditions, schooling and income did not show any association with the outcome.

As to the age variable, this study showed significant and inverse association with anxiety. For those aged ≥ 60 years, PR was 0.65 for anxiety in relation to the group aged between 18 and 39 years old. A population-based study conducted in Australia observed that the prevalence of anxiety had a statistically significant decline with age among women, but this pattern was not reproduced by men²¹. Other factors indicate that depressive and

Table 3 - Distribution of the anxiety second characteristics studied. University Hospital Dr. Miguel Riet Corrêa Jr., Rio Grande, Rio Grande do Sul, 2011 (n = 282).

Tabella 3 - Distribuição da ansiedade segundo características estudadas. Hospital Universitário Dr. Miguel Riet Corrêa Jr., Rio Grande, Rio Grande do Sul, 2011 (n = 282).

Variable		Without anxiety % (187)	With anxiety % (95)	p-value
Categorized AUDIT	0 – 7 points	64.44 (154)	35.56 (85)	0.070 ^a
	8 – 15 points	80.95 (17)	19.05 (4)	
	16 – 19 points	42.86 (3)	57.14 (4)	
	20 – 40 points	86.67 (13)	13.33 (2)	
CAGE	≥ 2 Affirmative answers	69.23 (18)	30.77 (08)	0.740 ^a
	< 2 Affirmative answers	66.02 (169)	33.98 (87)	
Smoker	Yes	68 (68)	32 (32)	0.560 ^a
	No	62.24 (61)	37.76 (37)	
	Former-smoker	69.05 (58)	30.95 (26)	
Fageström scale	≥ 6 points	71.15 (37)	28.85 (15)	0.390 ^a
	< 6 points	63.04 (29)	36.96 (17)	
Regular physical activity	Yes	66 (33)	34 (17)	0.959 ^a
	No	66.38 (154)	33.62 (78)	
Consult with a reference doctor when necessary	Yes	59.46 (110)	40.54 (75)	0.001 ^a
	No	79.38 (77)	20.62 (20)	
Place of appointment with this doctor	Primary Care	47.89 (34)	52.11 (37)	0.161 ^a
	FURG outpatient clinic	71.43 (45)	28.57 (18)	
	Emergency room	40 (6)	60 (9)	
	Another public service	62.50 (5)	37.50 (3)	
	Private	71.43 (20)	28.57 (8)	
Number of previous chronic pathologies	1 (up to 2 pathologies)	73.06 (160)	26.94 (59)	0.001 ^c
	2 (3 pathologies)	55 (22)	45 (18)	
	3 (4 pathologies)	21.74 (5)	78.26 (18)	
Type of chronic pathology				
DM	Yes	46.94 (23)	53.06 (26)	0.002 ^a
	No	70.39 (164)	29.61 (69)	
SAH	Yes	52.08 (50)	47.92 (46)	0.001 ^a
	No	73.66 (137)	26.34 (49)	
HIV	Yes	77.78 (28)	22.22 (8)	0.119 ^a
	No	64.63 (159)	35.37 (87)	
Obesity	Yes	28.57 (6)	71.43 (15)	0.001 ^a
	No	69.35 (181)	30.65 (80)	
Cardiac	Yes	51.79 (29)	48.21 (27)	0.001 ^a
	No	69.91 (158)	30.09 (68)	
Psychiatric	Yes	42.86 (3)	57.14 (4)	0.180 ^a
	No	66.91 (184)	33.09 (91)	
Hospitalization in the past 12 months	Yes	58.88 (63)	41.12 (44)	0.040 ^a
	No	70.69 (123)	29.31 (51)	
Days of current hospitalization	Mean (SD)	10.2 (9.10)	10.4 (10.35)	0.830 ^b
Number of classes of medicines prescribed during hospitalization	Up to 3 classes	75 (36)	25 (12)	0.010 ^c
	4 – 5 classes	70.18 (80)	29.82 (34)	
	6 – 7 classes	66.25 (53)	33.75 (27)	
	≥ 8 classes	43.75 (14)	56.25 (18)	
Type of prescribed medication	Anxiolytics	52.27 (23)	47.73 (21)	0.032 ^a
	Painkillers	67.5 (160)	32.5 (77)	
	Antidepressants	63.3 (19)	36.7 (11)	
Presence of the student	Yes	68 (136)	32% (64)	0.490 ^a
	No	63.64 (49)	36.36% (28)	
Estimate of the patient about the time the student remained with him/her	5 – 10 min	44.44 (8)	55.56% (10)	0.001 ^a
	11 – 20 min	80 (64)	20% (16)	
	21 – 30 min	72.73 (40)	27.27% (15)	
	> 30 min	50 (23)	50% (23)	

^aChi-square test; ^bHeterogeneity test; ^cLinear trend test.

^aQui-quadrado; ^bTeste de heterogeneidade; ^cTeste de tendência linear.

Tabela 4 - Razões de prevalência e IC95% ajustadas para ansiedade e fatores associados (modelo final), em pacientes internados na enfermaria de clínica médica. Hospital Universitário Dr. Miguel Riet Corrêa Jr., Rio Grande, Rio Grande do Sul, 2011 (n = 281).

Table 4 - Adjusted prevalence ratios and 95%CI for anxiety and associated factors (final model), in patients hospitalized in the clinical ward. University Hospital Dr. Miguel Riet Corrêa Jr., Rio Grande, Rio Grande do Sul, 2011 (n = 281).

Variable		PR	95%CI	p-value
First level of analysis				
Gender	Male	1		
	Female	2.44	1.68 – 3.56	0.0001 ^a
Age	18 – 39	1		
	40 – 59	0.84	0.56 – 1.21	0.04 ^c
	60 ou +	0.65	0.43 – 0.99	
Schooling ≥ 8 years	No	1		
	Yes	0.72	0.49 – 1.06	0.1 ^a
Second level of analysis				
AUDIT	0–7 points	1		0.16 ^b
	8–15 points	0.74	0.35 – 1.55	
	16–19 points	2.14	0.90 – 5.08	
	20–40 points	0.54	0.16 – 1.81	
Third level of analysis				
Place of appointment	Não consulta	1		0.0008 ^b
	Atenção primária	2.37	1.53 – 3.67	
	Ambulatório da FURG	1.24	0.74 – 2.07	
	Pronto-socorro	2.34	1.20 – 4.26	
	Outro local público	1.36	0.53 – 3.47	
	Privado	1.37	0.67 – 2.78	
Forth level of analysis				
Pre-existing chronic diseases:				
DM		1.43	1.01 – 2.02	0.04 ^a
SAH		1.57	1.12 – 2.18	0.007 ^a
Obesity		1.43	1.06 – 1.91	0.016 ^a
Estimate of the patient about the time the student remained with him/her	None	1		
	Up to 10 min	1.34	0.81 – 2.22	0.007 ^b
	11–20 min	0.61	0.38 – 1.00	
	21–30 min	0.76	0.47 – 1.25	
	> 30 min	1.36	0.95 – 1.93	

^aChi-square test; ^bHeterogeneity test; ^cLinear trend test.

^aQui-quadrado; ^bTeste de heterogeneidade; ^cTeste de tendência linear.

anxiety disorders are very prevalent among the elderly²². Due to such divergences in the prevalence findings and because of the lack of consistence concerning the existence or not of an association between older age and anxiety among inpatients, and also because of the particular functioning of this age group, we believe the creation of a proper and reliable scale is useful to measure the anxiety among the elderly, especially among people who are hospitalized.

From the point of view of use of medical assistance, this study revealed an association between the place where the patient usually goes to when feeling a health issue with anxiety. The ER and PHC were the places with higher prevalence ratios (PR > 2.3) in relation to those interviewees who usually do not see a doctor. It is known that the presence of anxiety in a patient hospitalized in a general hospital can be a manifestation of a pre-existing psychiatric disorder in which anxiety is

prevalent as a symptom²³. The patient who frequently seeks assistance in the ER is usually has severe acute or reacute conditions (highly anxiogenic situations) and, also, who could present with tendencies of immediatism and lack of a connection with a specific doctor. On the other hand, epidemiological studies demonstrate the high prevalence of mental disorders in patients assisted in primary care^{24,25}. These facts can be related to the finding in this study. It is not necessarily just the place of usual care that increases the anxiety of the inpatient, considering that many patients already have previous risk factors to develop anxiety at the time of hospital admission.

Several organic illnesses can present anxiety as a symptom²³. In our study, after adjustment with other confusion factors, interviewees who had SAH, obesity and DM as pre-existing chronic conditions were significantly more anxious. These findings corroborate the researched literature. Concerning SAH, a German study obtained statistically significant difference between hypertensive and control individuals²⁶. Other studies also demonstrate the association between SAH and anxiety^{27,28}. Concerning obesity, there seems to be a directly proportional relation between the presence of depression and anxiety symptoms with Body Mass Index (BMI)²⁹. A study involving patients with severe obesity pointed out to the high incidence of anxiety and depression symptoms in these patients³⁰. In relation to DM, a population study in Germany found the association of diabetes with anxiety disorders³¹.

Other clinical conditions are associated with higher prevalence of anxiety. It is known that heart conditions are associated with this disease²³. In our study, in the stage of bivariate analysis, there was significant association of heart disease with anxiety; however, such association was lost after the adjustment. Anxiety disorders are also prevalent among patients infected by HIV, especially in diagnosis situations, new treatments and acute disease³². However,

in this study, this disease did not show significant association with the outcome. This non-association may have occurred due to the reduced number of patients with heart disease and with diagnosis of HIV found in this study.

The high rate of patients with prescribed painkillers (84%) may have been related to the fact that anxiety decreases the pain threshold, which ends up leading to the prescription of fewer painkillers²³, however, in this study there was no significant association between these two variables. The same occurred with the class of antidepressants and anxiolytics. In the bivariate analysis, anxiolytics had significant p-value, however, this association was lost after the adjustment.

Meta-analyses about physical exercise and mental health concluded that physical activities are efficient to reduce anxiety^{33,34}. In our study, the association between self-declared regular physical exercise and anxiety has not been shown. We emphasize that the study was carried out with hospitalized patients, however, away from their habitat and daily activities, which may interfere with the results.

Epidemiological and clinical studies have demonstrated a positive and significant association between smoking and anxiety disorders^{35,36}. Smoking has a complex interference on mood, and abstinence transitorily worsens mood, anxiety and cognition³⁷. Even though the reviewed literature indicates strong evidence of association between smoking and anxiety disorders, this was not observed among the participants in this study. In this research, the association was not confirmed even patients with Fageström score ≥ 6 points (with possibility to have abstinence crisis).

It is known that anxiety or depressive disorders are the most commonly psychiatric comorbidities associated with alcoholic patients³⁸, however, in this study, alcohol use and abuse did not show significant association with the outcome.

This study showed the association between the anxiety of inpatients in a clinical ward of a university hospital with the variable estimates of the patient about the time the student stayed with him/her. An interesting fact was the variation of PR in relation to stratified time intervals that showed a “U” pattern, demonstrating that the association is higher in time extremes and lower in middle categories with relation to the base category. This finding can be related to several factors. For instance, it is possible that, depending on the time the student stays in touch with the patient anxiety increases and/or decreases. However, it is plausible that anxious patients can, at the same time, depending on the way the student reacts to the psychosocial complaints, “repel” and/or “restrain” the students even more. Therefore, this finding should be made clearer by other studies; if the association is confirmed, the question that comes up is related to the ideal time for the student to stay with the hospitalized patient.

Concerning the methodological limitations of the study, we can mention that it is a cross-sectional study, therefore, the possibility of reverse causality is inevitable. We conducted the study in a school hospital, so, the results cannot be extrapolated to other general hospitals in Brazil. The reduced sample size may have decreased the statistical power for some associations.

Conclusions

This study identified high prevalence of anxiety among hospitalized patients in the clinical ward of a university hospital. The conclusion was that, by controlling the effect of variables that generate confusion, there is a significant association between the anxiety of these hospitalized patients with gender variables (higher among women), age (higher among young people), usual place of medical care (higher in PHC and ER), some chronic pre-existing diseases (higher among diabetic, hypertensive and obese patients) and the estimate of the patient about the time the student stayed with him.

This profile will enable the assistant doctor to identify the patients who are most likely to suffer with anxiety during hospital stay and, therefore, recognize the individuals with anxiety early so that the proper therapy can be administered.

The performance of more studies is suggested to analyze the anxiety in this population, as well as other designs and instruments, with more participants to better elucidate the factors associated with the outcome.

Due to the high prevalence of anxiety, the study points out to the real need to make an approach more addressed to mental health in the scenario of hospital care available.

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