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Predictors of anxiety and depression in general surgeons and clinicians attending hospital urgencies and emergencies

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Abstract

We assess the risk factors and the prevalence of anxiety and depression in 75 physicians, who provided care in the area of emergency and hospital emergency in our service.

Method: Exploratory and observational research at the beginning of the COVID pandemic in a city in southern Brazil, using sociodemographic questionnaire and the Hospital Anxiety and Depression Scale.

Results: The prevalence of anxiety in general surgeons was 36.5%, for depression was 23.1%. In clinicians, were 30.4% and 21.7% (respectively) in anxiety, the variables: marital status, sleep duration, and time of graduation were significantly associated? For depression were age, marital status, number of children, time of graduation, and having taken Advanced Cardiologic Life Support course. Overweight and sleep duration were significant risk factors for anxiety, in multivariate analysis, with an Odds Ratio (OR) of 5.16 and 5.81 (respectively). For depression, only the time of graduation less than ten years was significant (OR 21.8).

Conclusions: General surgeons presented a higher prevalence of anxiety and depression than clinicians. The overweight and sleeping time were associated with a higher anxiety prevalence, while training time was associated with a higher depression prevalence. Differences between medical specialties in-hospital care incite a concern regarding the mental health of these professionals.

Keywords: Mental Health; Anxiety; Depression; Hospital Anxiety and depression Scale; Coronavirus Infections.

1. Introduction

Infection with the new Coronavirus (Sars Cov-2), known as COVID-19, was detected in December 2019, and it spread throughout the different continents, gradually characterized as a pandemic by the World Health Organization [1].

Health professionals deal with difficult decisions in their work routine. The greater demand for professionals in the fight against the “pandemic”, work overload, concern with changes in the work routine, feeling of high risk of contamination, the effect of the disease on professional life, and depressed mood [2], in addition to inadequate infrastructure in some places, can contribute to psychological and mental illnesses [3,4].

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However, health professionals have an essential role in the performance during the pandemic crises such as COVID-19 [5]. They add the need to maintain the provision of their services under the guidelines of local health agencies, in addition to dealing with a greater risk of contamination than of the population in general [6,7].

The COVID-19 and the mitigating aspects for mental health were a research construct for Moreira, Sousa, and Nóbrega (2020) whose found that anxiety is classified as the principal mental disorder, being present in 85% of the cases, followed by depression in 59% in the studies [8].

According to Zhu, et.al. (2020), during the COVID-19 pandemic, the prevalence of anxiety and depression among physicians was 11.4% and 45.6%. Amin, et.al. (2020) found a prevalence of 43% of anxiety and depression, and they have demonstrated the need to address the mental health of these professionals and promote the psychological well-being of physicians [9,10].

Hasan (2020), using the Hospital Anxiety and Depression Scale (HADS), in physicians, without reporting which specialty they belonged to, demonstrated the prevalence of anxiety and depression symptoms among them was 67.72% and 48.5%, respectively [11]. There are differences in the prevalence of anxiety and depression in physicians, reported in the literature, mainly during this period of pandemic, but which demonstrates how important this issue lacks attention.

This study aimed to analyze the prevalence of anxiety and depression, and associated risk factors in a group of Clinicians and General surgeons, who worked in hospitals and provided emergency and urgent care in the initial period of the Sars Cov-2 pandemic in a city in the south of Brazil.

2. Methods

An exploratory and observational study, carried out in a city in southern Brazil, with voluntary and anonymous participation of 75 physicians, who worked in urgent and emergency care. A sociodemographic questionnaire and the Hospital Anxiety and Depression Scale (HADS) were applied through an electronic form and the answers were collected in an Excel spreadsheet for further evaluation.

The study period took place between April and June 2020, coinciding with the beginning of the pandemic of COVID 19 in our country. It was approved by the Research Ethics Committee of the State University of Maringá, opinion nº 31799220.4.0000.010. The HADS [12] consists of a self-report questionnaire with seven items for anxiety assessment and seven items for depression assessment. This instrument measures evident psychological symptoms, as there is no interference of somatic disorders in the scale score, excluding all symptoms of anxiety or depression related to physical illnesses [13].

The cut-off points for each subscale, used in this study as a “screening” tool to assess the prevalence of anxiety and depression, were values whose total sum of points was ≥ 8 for HADS-A and HADS-D [14,15]. All analyzes performed using the Jamovi statistical environment, version 1.6. 23 [16].

We investigate the possible associations between the characteristics of Clinicians and General surgeons with anxiety and depression, and Univariate logistic regression was used, estimating the Odds Ratio (OR) effect, with a 95% confidence interval. To assess the goodness of fit of the multivariate model used the Hosmer and Lemeshow test and the ROC curve for discrimination of the proposed logistic model.

We used the methodology proposed by Hosmer and Lemeshow (1989), and the variables that were associated with less moderate association ($p < 0.25$) with the variable of interest in the chi-square test were selected. These variables had been included in the multivariate model, which estimates the adjusted OR, considering possible interactions between the variables [17].

3. Results

The mean HADS-A score was 6.37 points (+/- 3, 35). To HADS-D, it was 5.04 points (+/- 3.16). The internal consistency of HADS-A measured by Cronbach's alpha coefficient (CAC) was 0.80 (+/- 0.45). For HADS-D, the CAC value was 0.77 (+/- 0.18), lower but acceptable. Between April and July 2020, 75 physicians who worked in hospitals, attending urgent and emergency situations, participated in this study. Of these, 86.67% were male, with a mean age of 40.1 years (24 to 71 years) and a standard deviation (SD) of 9.98. The majority (n: 43, 57.3%) was in the age group up to 40 years, married

(n: 55, 73.3%), and with children (n: 46, 61.33%), were not smokers (n: 71, 94.7%), besides 46.7% being sedentary, 48% overweight. Regarding the specialty, 52 (69.3 %) were surgeons, and 41 (54.7%) formed less than ten years ago.

Table 1 Univariate analysis of anxiety as a function of factors under study and t-test result.

Variable	No anxiety	With anxiety	Crude OR	95% CI	χ^2 (p-value)	Yates
ER						1
Not on duty	16 (32.7%)	9 (34.6%)	1	-	-	
On-call	33 (67.3%)	17 (65.4%)	0.92	0.34-2.50	0.864	
Speciality						0.803
Clínician	16 (32.7%)	7 (26.9%)	1	-	-	
General surgeon	33 (67.3%)	19 (73.1%)	1.32	0.46-3.77	0.609	
Gender						0.461
Male	44 (89.8%)	21 (80.8%)	1	-	-	
Female	5 (10.2%)	5 (19.2%)	2.1	0.55-8.04	0.274	
Age						0.151
Over or equal to 40 years old	23 (46.9%)	7 (26.9%)	1	-	-	
Under 40 years old	26 (53.1%)	19 (73.1%)	2.4	0.86-6.74	0.092	
Weight						0.150
Normal	17 (34.7%)	4 (15.4%)	1	-	-	
Overweight	20 (40.8%)	16 (61.5%)	3.4	0.95-12.13	0.059	
Obese	12 (24.5%)	6 (23.1%)	2.13	0.49-9.19	0.313	
Marital status						0.050
Married	40 (81.6%)	15 (57.7%)	1	-	-	
Single	9 (18, 4%)	11 (42.3%)	3.26	1.13-9.43	0.026*	
Offspring						0.086
With children	34 (69.4%)	12 (46.2%)	1	-	-	
Childless	15 (30.6%)	14 (53.8%)	2.64	0.99-7.06	0.049*	
Educational level						0.830
Graduation or specialization	41 (83.7%)	23 (88.5%)	1	-	-	
Master/Doctorate	8 (16.3%)	3 (11.5%)	0.67	0.16-2.77	0.577	
Smoking						1.000
No	40 (82.0%)	23 (88.0%)	1	-	-	
Ex-smoker	6 (12.0%)	2 (8.0%)	0.89	0.62-1.27		
Yes	3 (6.1%)	1 (3.8%)	0.61	0.06-6.21	0.676	
Practice physical activity						0.506
No	28 (57.1%)	12 (46.2%)	1	-	-	
Yes	21 (42.9%)	14 (53.8%)	0.64	0.24-1.67	0.364	
Sleep duration						0.023*
More than 6 hours	40 (81.6%)	14 (53.8%)	1	-	-	
Up to 6 hours	9 (18.4%)	12 (46.2%)	3.81	1.32-11.00	0.011*	
Training time						0.022*
More than 10 years	32 (65.3%)	9 (34.6%)	1	-	-	
Up to 10 years	17 (34.7%)	17 (65.4%)	3.56	1.31-9.66	0.011*	

ATLS						0.099
Yes	43 (87.8%)	18 (69.2%)	1	-	-	
No	6 (12.2%)	8 (30.8%)	3.19	0.97-10.50	0.05	
ACLS						0.175
Yes	46 (93.9%)	21 (80.8%)	1	-	-	
No	3 (6.1%)	5 (19.2%)	3.65	0.82-19.17	0.08	
Job satisfaction						0.142
Less than 80%	16 (33.3%)	14 (53.8%)	1	-	-	
Greater than or	33 (66.7%)	12 (46.2%)	2.33	0.89-6.20	0.086	

Note: ATLS: Advanced Trauma Life Support, ACLS: Advanced Cardiac Life Support.

The frequency distribution of the variables considered according to the presence of anxiety; and the results of the Chi-square association test (χ^2) and estimates of crude OR, with their respective p-values, obtained through the adjustment of univariate logistic models, are arranged in Table 1.

The results presented in Table 1, show that among professionals with a higher prevalence of anxiety, the chances of singles are equivalent to more than three times the chances of married (OR of 3.26), and this difference was significant (p-value of χ^2 0.026; CI 95% 1.13-9.43).

Similarly, we noted that the chances of professionals who indicated less than six hours of sleep per night, and those with less than ten years of training, presenting anxiety was significantly higher (OR of 3.81 (95% CI: 1.32-11.00) and OR of 3.56 (95% CI: 1.31-9.66), respectively. For other variables, no significant sample evidence had been observed ($p < 0.05$).

The variables: hours of sleep and training time presented sufficient evidence of significant association with anxiety, at the level of 5% significance, and in addition to these, age, weight, marital status, children, ATLS, ACLS, and job satisfaction, were included in the multiple models because they presented moderate association, with p-value lower than 0.25 (Table 2).

Table 2 Multivariate analysis of anxiety due to factors under study.

Variable	Adjusted OR	CI 95% (min.- max.)	p value
Age			
Over or equal to 40 years	1	-	-
Under 40 years old	1.06	0.11-9.83	0.957
Weight			
Normal	1	-	-
Overweight	5.87	1.23-27.93	0.026*
Obese	2.01	0.34-11.97	0.442
Marital status			
Married	1	-	-
Single	1.95	0.30-12.75	0.484
Offspring			
With children	1	-	-
Childless	1.23	0.15-9.84	0.846
Sleep duration			
More than 6 hours	1	-	-

Up to 6 hours	5.06	1.43–17.98	0.012*
Training time			
More than 10 years	1	-	-
Up to 10 years	2.92	0.33–26.14	0.338
ATLS			
Yes	1	-	-
No	1.93	0.36–10.23	0.439
ACLS			
Yes	1	-	-
No	1.75	0.27–11.14	0.553
Job satisfaction			
Less than 80%	1	-	-
Greater than or	2.38	0.59–9.60	0.225

Note: ATLS: Advanced Trauma Life Support, ACLS: Advanced Cardiac Life Support.

Table 2 shows that having less than 6 hours of sleep per night remained a risk factor for anxiety, since the chances were significantly higher for professionals with this profile compared to those who sleep more than 6 hours (OR of 5.06 and p-value of 0.012), at the level of 5% significance. Overweight also stood out as a risk factor, increasing the chances of anxiety by more than five times concerning individuals with proper weight (OR of 5.87 and p-value of 0.026).

The frequency distribution of the factors considered, according to the presence of depression, and the results of the Chi-square association test (χ^2) and estimates of crude OR obtained through the adjustment of univariate logistic models, are shown in Table 3.

Table 3 Univariate analysis of depression as a function of factors under study and t-test result.

Variable	No Depression	With Depression	Crude OR	95% CI (min-max)	X2 (p value)	Yates
ER						1.000
Not on duty	19 (32.8%)	6 (35.3%)	1	-	-	
On-call	39 (67.2%)	11 (64.7%)	0.89	0.29-2.78	0.845	
Speciality						1.000
Clinician	18 (31.0%)	5 (29.4%)	1	-	-	
General surgeon	40 (69.0%)	12 (70.6%)	1.08	0.33-3.52	0.898	
Gender						0.317
Male	52 (89.7%)	13 (76.5%)	1	-	-	
Female	6 (10.3%)	4 (23.5%)	2.67	0.66-10.90	0.16	
Age						0.015*
Over or equal 40 years old	28 (48.3%)	2 (11.8%)	1	-	-	
Under 40 years old	30 (51.7%)	15 (88.2%)	7	1.47–33.40	0.007*	
Weight						0.153
Normal	18 (31.0%)	3 (17.6%)	1	-	-	

Overweight	29 (50.0%)	7 (41.2%)	1.45	0.34-6.33	0.153	
Obese	11 (19.0%)	7 (41.2%)	3.82	0.81-17.93		
Marital status						0.064
Married	46 (79.3%)	9 (52.9%)	1	-	-	
Single	12 (20.7%)	8 (47.1%)	3.41	1.08-10.7	0.031*	
Offspring						0.026*
With children	40 (69.0%)	6 (35.3%)	1	-	-	
Childless	18 (31.0%)	11 (64.7%)	4.07	1.30-12.70	0.012*	
Education level						1.000
Graduation or especialization	49 (84.5%)	15 (88.2%)	1	-	-	
Master/Doctorate	9 (15.5%)	2 (11.8%)	0.73	0.14-3.73	0.701	
Smoking						0.336
No	49 (84.5%)	14 (82.4%)	1	-	-	
Ex-smoker	5 (8.6%)	3 (17.6%)	2.1	0.45-9.89	0.348	
Yes	4 (6.9%)	0 (0%)	-	-	0.993	
Practice physical activity						0.156
No	34 (58.6%)	6 (35.3%)	1	-	-	
Yes	24 (41.4%)	11 (64.7%)	0.39	0.13-1.18	0.09	
Sleep duration						0.649
More than 6 hours	43 (74.1%)	11 (64.7%)	1	-	-	
Up to 6 hours	15 (25.9%)	6 (35.3%)	1.56	0.49-4.96	0.446	
Training time						<0.001
More than 10 years	39 (67.2%)	2 (11.8%)	1	-	-	
Up to 10 years	19 (32.8%)	15 (88.2%)	15.4	3.19-74.30	< 0.001*	
ATLS						0.100
Yes	50 (86.2%)	11 (64.7%)	1	-	-	
No	8 (13.8%)	6 (35.3%)	3.41	0.98-11.80	0.05	
ACLS						0.016*
Yes	55 (94.8%)	12 (70.6%)	1	-	-	
No	3 (5.2%)	5 (29.4%)	7.64	1.60-36.40	0.004*	
Satisfaction						0.365
Less than 80%	21 (36.8%)	9 (52.9%)	1	-	-	
Greater than or	36 (63.2%)	8 (47.1%)	1.93	0.65-5.76	0.235	

Note: ATLS: Advanced Trauma Life Support, ACLS: Advanced Cardiac Life Support.

Table 3 shows that the chances of general and clinical surgeons under the age of 40 years presenting depression are seven times the chances of older patients, with an OR of 7.00 [95% CI 1.47 - 33.40].

We noticed that the prevalence of depression in single professionals and without children was higher (47% and 65%, respectively) concerning those who were not (21% and 31%, respectively). Singles had a higher chance of depression (OR of 3.41 [95% CI: 1.08-10.70]) and also those without children (OR of 4.07 [95% CI: 1.30-12.70]).

Professionals with a training time of fewer than ten years had significantly higher chances of having depression compared to the others, with OR of 15.40 [95% CI: 3.19-74.30], as well as those with the ACLS course (OR of 7.64 [95% CI: 1.60-36.40]).

Age less than 40 years, marital status, number of children, time of education, and ACLS presented sufficient evidence of significant association with depression, at the level of 5% significance. In addition to these, weight, physical activity practice, and ATLS were included in the multiple models because they presented moderate association, with a p-value lower than 0.25 (Table 4).

Table 4 Multivariate analysis of depression due to factors under study.

Variable	Adjusted OR	CI 95% (min.-máx.)	p Value
Weight			
Normal	1	-	-
Overweight	1.36	0.22–8.51	0.746
Obese	6.73	0.77-58.61	0.084
Marital status			
Married	1	-	-
Single	1.4	0.19-10.15	0.742
Offspring			
With children	1	-	-
Childless	1.1	0.12-10.12	0.935
Practice physical activity			
No	1	-	-
Yes	0.89	0.19–4.20	0.883
Training time			
More than 10 years	1	-	-
Up to 10 years	21.8	2.31-205.72	0.007*
ATLS			
Yes	1	-	-
No	4.06	0.76–22.09	0.105
ACLS			
Yes	1	-	-
No	4.19	0.60–29.25	0.149

Note: ATLS: Advanced Trauma Life Support, ACLS: Advanced Cardiac Life Support.

As can be seen in Table 4, only the training time of up to 10 years remained the only risk factor for depression, at the level of 5% significance.

4. Discussion

In our study, 34.7% and 22.7% of all participants reported symptoms of anxiety and depression, respectively. The mean HADS-A's score for general surgeons was 6.44 points, with a standard deviation (SD) of 3.12, and the mean HADS-D's score was 4.81 points with an SD of 3.47. The mean HADS-A's score for clinicians was 6.04 points with an SD of 3.70, and for HADS-D was 5.57 points with an SD of 2.27, pointing to more anxious surgeons and more depressed clinicians.

However, the prevalence of anxiety in general surgeons was 36.54%, and in clinicians, it was 30.43%. For depression in surgeons, it was 23.08%, and in clinicians, it was 21.73%. Different results were from the study by ZHU et.al. (2020), who found prevalence, among physicians, of anxiety with values of 11.4% and depression reaching 45.6%, but without differences by specialties [10].

In another study, Sharif *et.al.*, evaluated stressors that affected neurosurgeons during the pandemic, finding 14% of depression in that group [18]. A study with Brazilian head and neck surgeons showed anxiety in 45.5% and depression in 16 % [19]. In both studies the specialties evaluated were surgical but not general surgeons.

Lima (2014) found anxiety and depression rates of 51% and 31.4% (respectively) in medical clinic professionals, and 51.1% and 25.5% (respectively) in general surgery and subspecialty residents, but considering overall, found anxiety rates of 41.3% and depression rates at 21.6%, almost similar to those found in our study [20].

In our study, most physicians were male, with surgical training, less than 40 years old, with less than ten years of training, working in service in an emergency care unit. These data differ from data from the Regional Medical Council of the State of São Paulo, about the physician profile in Brazil. It shows that about 73.7% of younger physicians are generalists, women were the majority in Internal Medicine (50.4%) but in General Surgery only 18.4% and with on-call students (45.1%) less than ten years [21].

According to Levites et.al.(2018), younger physicians with shorter practice time, and lack of experience, may have impairment in their perception of how to deal with clinical uncertainties [22], and this affects their daily life and can cause damage to mental health.

Poor sleep quality is associated with an increase in long-term health problems, including mental health [23,24]. In our study, physicians with some hours of sleep less than six hours/night, there was a higher prevalence of anxiety compared to those who slept longer (OR 3.81).

A study conducted in young adults investigating sleep duration, self-reported, with psychological distress (including anxiety), observed that every hour less sleep, there was an increase in risk by 14%, being null in those who slept up to nine hours a night [25,26,27].

Cardoso (2009) observed in medical students an average of hours of sleep per night lower than the general adult population [28]. It seems that this panorama does not change much after medical training, where most professionals end up doing shifts in emergency and emergency units and sometimes with exhausting workload and number of visits, which can compromise their necessary rest [21].

In our study, 48% of professionals were overweight, considered the body mass index (BMI) over 25kg/m². These presented a higher prevalence of anxiety concerning adequate weight and obese individuals (OR 5.81). A meta-analysis study showed a higher prevalence of anxiety in obese/overweight people [29].

Anxiety and depression are commonly associated with eating disorders [30,31], may lead to attitudes with unhealthy behaviors, such as alcohol consumption, tobacco, sedentary life, implying the development of chronic conditions such as obesity [32].

A relationship was observed between depression in physicians aged less than 40 years (OR 7) and training time less than ten years (OR 15.36). The work and personal routine of young doctors who will face, throughout their career, a series of professional demands, putting them at risk for mood disorders, including depression, are considered one of the most prevalent work-related mental disorders in the medical class [33].

The study made by Tironi *et.al.* (2016) showed risks of professional stability in young intensivists, with a training time of fewer than ten years and with a high weekly workload [34,35]. Most assistant physicians in hospital and emergency rooms are not intensive care providers, but the profile found is similar.

The work routine imposed in the first years of work, after leaving the academy, associated with personal carelessness and non-recognition of the disease, could explain this higher prevalence of depression in these professionals, with a degree time of fewer than ten years as found here.

Limitations

The sample size was our main limitation. However, in the study by ZHU *et.al.* (2020) in a sample of 79 physicians, it was possible to determine the prevalence of anxiety and depression in physicians. Our study group involved specialists who attend urgent and emergency situations in hospitals, limiting the possibility of other specialists from other sectors, such as clinics and pre-hospital care, being concomitantly evaluated, which would represent a larger sample.

The use of the online platform also limited the study. The professionals were afraid to answer the questionnaires sent via access link because they considered "Fake News", associated with the fear of cloning applications such as WhatsApp.

The concern that the invitation was fake existed, making it difficult to increase the number of respondents. However, this did not make the results impossible, providing an assessment of a set of relevant factors consistent with the literature.

5. Conclusion

The study period coincided with the beginning of the COVID 19 pandemic in our country. Although the findings cannot infer that the prevalence found of both anxiety and depression in surgeons was higher because of the pandemic or because of the surgical specialty. Differences between clinical and surgical specialties were observed, which may infer that professional training and environment in which they work, can modify the outcome with regard to the prevalence of anxiety.

We understand that the matter is a concern since these professionals are directly linked to urgent and emergency care and it is known that this in itself can lead to a disorder in their mental health.

In addition, the data found in this study corroborate those indicated in the literature in the last ten years, which showed a higher prevalence of anxiety than depression in health professionals, in younger ones, in those with sleep deprivation and altered body weight.

Individual Contributions

Doctors also get sick physically and mentally. Moreover, some don't like to feel ill or to say they are sick. As a surgeon with experience in emergency rooms, I see anxious colleagues with difficulty doing their jobs. If mental health is compromised, this can lead to inadequate patient care.

Studying the risk factors associated with mental disorders in health professionals contributes to direct attention, promote prevention and treatment strategies when necessary, especially in times of pandemics.

Compliance with ethical standards

Acknowledgments

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Disclosure of conflict of interest

The authors report there are no competing interests to declare.

Statement of informed consent

We confirm that all participants have given consent for their data to be used in the research.

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