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# Factors associated with anxiety in multiprofessional health care residents during the COVID-19 pandemic

*Fatores associados à ansiedade em residentes multiprofissionais em saúde durante a pandemia por COVID-19*

*Factores relacionados a la ansiedad en residentes multiprofesionales en salud durante la pandemia de COVID-19*

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## ABSTRACT

**Objective:** To estimate the prevalence and factors associated with anxiety among multiprofessional health residents during the COVID-19 pandemic. **Methods:** Cross-sectional study, conducted in July 2020 with multiprofessional health residents (n = 67) from a university hospital. We used the *Beck Anxiety Inventory* to assess anxiety. Analyzing data through the chi-square test, likelihood ratio, and multiple analysis using Poisson regression with robust variance. **Results:** The proportion of moderate/severe anxiety was 31.3%, which showed significant association with working in sectors involving COVID-19 and directly with suspected/confirmed cases of COVID-19. During the multiple analysis, we found prevalence of anxiety in participants who needed psychological support after entering their residence and those who used psychotropic meds. **Conclusion:** The results seem to indicate that residents had their mental health impaired during the pandemic, but the maintenance of the variables in the model also suggests that they sought help to control anxiety.
**Descriptors:** Anxiety; Internship and Residence; University Hospitals; Pandemic; Coronavirus Infections.

## RESUMO

**Objetivo:** Estimar a prevalência e os fatores associados à ansiedade entre residentes multiprofissionais em saúde durante a pandemia da COVID-19. **Métodos:** Estudo transversal, realizado em julho de 2020 com residentes multiprofissionais em saúde (n = 67) de um hospital universitário. Utilizou-se a *Beck Anxiety Inventory* para avaliação da ansiedade. Analisaram-se os dados usando teste qui-quadrado, razão de verossimilhança e análise múltipla mediante regressão de Poisson com variância robusta. **Resultados:** A proporção de ansiedade moderada/grave foi de 31,30%, que apresentou associação significante com trabalhar em setores envolvendo COVID-19 e diretamente com casos suspeitos/confirmados de COVID-19. Na análise múltipla, observou-se prevalência de ansiedade nos participantes que precisaram de acompanhamento psicológico após entrada na residência e que usavam psicotrópicos. **Conclusão:** Os resultados parecem indicar que os residentes tiveram sua saúde mental prejudicada durante a pandemia, porém a manutenção das variáveis no modelo também sugere que buscaram ajuda para o controle da ansiedade.
**Descritores:** Ansiedade; Internato e Residência; Hospitais Universitários; Pandemia; Infecções por Coronavírus.

## RESUMEN

**Objetivo:** Estimar prevalencia y factores relacionados a la ansiedad entre residentes multiprofesionales en salud durante la pandemia de COVID-19. **Métodos:** Estudio transversal, realizado en julio de 2020 con residentes multiprofesionales en salud (n = 67) de un hospital universitario. Utilizó la *Beck Anxiety Inventory* para evaluación de ansiedad. Analizaron los datos usando prueba chi-cuadrado, razón de verosimilitud y análisis múltiple mediante regresión de Poisson con variación robusta. **Resultados:** Proporción de ansiedad moderada/grave fue de 31,30%, que presentó relación significante con trabajar en sectores envolviendo COVID-19 y directamente con casos sospechosos/confirmados. En el análisis múltiple, observó prevalencia de ansiedad en los participantes que precisaron de acompañamiento psicológico después de entrada en la residencia y que usaban psicotrópicos. **Conclusión:** Resultados parecen indicar que residentes tuvieron su salud mental perjudicada durante la pandemia, pero la manutención de las variables en el modelo también sugiere que buscaron ayuda para el control de la ansiedad.
**Descriptores:** Ansiedad; Prácticas y Residencia; Hospitales Universitarios; Pandemia; Infecciones por Coronavirus.

## INTRODUCTION

In December 2019, the first cases of *Coronavirus Disease* 2019 (COVID 19) appeared in Wuhan, China, caused by severe acute respiratory syndrome by coronavirus 2 (SARS-CoV-2). The World Health Organization considered the new disease pandemic on March 11, 2020[1]. In Brazil, they identified the first case on February 25, 2020; and, according to the Ministry of Health, as of August 21, 2020, the country had already registered 3,532,330 cases and 113,358 deaths[2].

Health professionals who occupy the care front face numerous challenges that negatively impact their physical and mental health, such as the risk of contamination that can lead to illness and death, intense anxiety levels, sleep disorders, fear of contaminating colleagues and family, social isolation, lack of hospital supplies, and personal protective equipment[3-5].

In this same scenario, multiprofessional residencies in health, established in Brazil since 1975, oriented towards action based on local and regional needs of the Sistema Único de Saúde (SUS) [Brazilian Unified Health System], provide professional students who strengthen and compose the health teams of many hospitals that work with residency programs and who care for suspected and confirmed COVID-19 patients[6]. In order to reconcile the teaching-learning process with the immediate response to the pandemic, the Brazilian National Health Council advised that the theoretical-practical activities of the residents, at the present time, must accompany the reorganization of services, networks, policies, and actions of the health sector in the rapid response to COVID-19[7].

The new context for residencies requires residents to have clinical reasoning and performance in the most varied scenarios. Consequently, they need greater physical and psychological efforts, as they find themselves in a transitional period between being a student and a professional[8-11]. In Brazil, studies deal with the exhaustive rhythms of everyday life during health care residencies, including multiprofessional, medical, and a single professional residency[12-18]. This happens for several reasons: organizational change of teams, reframing of work, training on a disease that is not that well-known, as well as its clinical, social, economic, and psychosocial repercussions[19], high levels of stress, work overload, panic, and increased anxiety symptoms[20].

With the changes caused by the state of the health crisis of international importance due to COVID-19, the question arises to whether these changes can generate psychosocial repercussions in multiprofessional residents during this period and intensify anxiety symptoms. Thus, recognizing the importance of health residents in the scope of health services in the country, especially in a time of a health crisis, it is necessary to identify the levels of anxiety in this working population during the pandemic to support a timely political-institutional response and better adaptation to the pandemic context.

## OBJECTIVE

To estimate the prevalence and factors associated with anxiety among multiprofessional health residents of a university hospital during the COVID-19 pandemic.

## METHODS

### Ethical aspects

The study complied with the ethical standards of Resolution 466/2012 of the National Health Council and obtained approval from the Ethics Committee on Research with Human Beings on June 8, 2020.

### Study design, period, and place

Cross-sectional study, guided by the STROBE tool, carried out in a large university hospital in the state of Rio Grande do Norte, Brazil, which has 242 hospital beds. Data collection carried out between the 12th and the 24th of July 2020, during which the hospital was already providing direct assistance to suspected and confirmed cases of COVID-19. In the same interval, Rio Grande do Norte registered 53,077 confirmed cases of COVID-19 and 1,858 deaths.

### Population or sample; inclusion and exclusion criteria

The study consists of a census conducted with all the elements that are part of the target population, that is, the residents of the hospital's Multiprofessional Health Programs (Adult Intensive, Child Health, Cardiology, and Psychosocial Care). Thus, the sample comprised all 1st and 2nd year multiprofessional health residents (n = 67). The only exclusion being the resident author of the study. Participation was voluntary.

### Study protocol

First, we used a questionnaire prepared by the authors, containing sociodemographic variables (age, sex, marital status, profession, family income). Professional performance in residency (residency program, year of residency, satisfaction with residency); mental health profile (psychological monitoring before and after residence, psychiatric monitoring before and after residence, use of psychiatric drugs); harassment and violence (sexual, psychological, and moral harassment; suffering violence); and coping with COVID-19 (acting in the COVID-19 sector, training, safety, use of personal protective equipment, and psychosocial coping strategies). Being a census study, the questionnaire was not pre-tested to not lose participants. However, to minimize differences in content and appearance, three researchers independently reviewed the instrument. These having experience in epidemiological studies and actuarial sciences fields.

Regarding the instrument for assessing anxiety and its levels, the *Beck Anxiety Inventory* (BAI) was used, considered the gold standard for measuring the variable of interest, validated in Brazil by Cunha[21] and Quintão, Delgado and Pietro[22]. A self-report scale that identifies the intensity of anxious symptoms in psychiatric and non-psychiatric populations with no psych diagnostic intention. It consists of 21 items, each on a scale of 0 to 3 points. The final score stratifies into minimal anxiety (0-7 points), mild (8-15 points), moderate (16-25 points) and severe (26-63 points)[21]. We assessed the reliability of BAI in the population of this study using Cronbach's alpha coefficient, obtaining a value of 0.926, considering the internal consistency to be good.

Data collection took place entirely online, on the Google Forms® platform. Enrollment of the participants was done via telephone contact and in-service approach. The link to the online form was sent via the WhatsApp® app or email. After clarification and awareness of voluntary participation, methods and procedures, all signed the Free and Informed Consent Form.

### Analysis of results and statistics

The data was analyzed, initially, with the description of the absolute and relative frequencies through the SPSS software, version 20.0. While assessing the existence of a statistically significant difference between the outcome variable (anxiety) and the other independent variables using the chi-square test or Fisher's exact test according to the adequacy of the data and likelihood ratio. The level of confidence employed was 5%.

We performed the multiple analysis through the statistical package R, using the Poisson regression model with robust variance. Significant variables at the level of 20% in the bivariate analysis were candidates for the final model. We compared the models using the Akaike Information Criterion (AIC)[2122]. The final model considered statistical significance at the 5% level, biological and epidemiological plausibility, estimating associations based on adjusted Prevalence Ratios and 95% confidence intervals.

## RESULTS

Most of the multiprofessional residents were female, aged 21 to 25 years old, lived without a partner, were nurses, part of the Adult Intensive Care residency program and in their first year of residency. Regarding family income, there was an equal frequency distribution between receiving only the residency grant and receiving between four and ten minimum wage salaries. It is noteworthy that more than 80% of the participants reported a reasonable, good, and excellent degree of satisfaction with the residency. Still, 31.30% of residents needed psychological counseling after entering the residency, 14.90% used psychotropic medication, and 31.30% (IC95% 20,19-42,40%) presented anxiety levels classified as moderate and severe (Table 1).

There was a greater proportion of respondents assigned to sectors with confirmed or suspected cases of COVID-19 (59.7%), and 67.2% provided assistance to these patients. In addition, the majority received specific training to assist suspected and confirmed cases of COVID-19 (77.6%). However, the largest proportion of these did not feel technical or scientific security to provide care to COVID-19 patients (59.70%). During the pandemic, 68.7% of the residents reported having suffered harassment, the most expressive being psychological (37.3%) and moral (44.8%) (Table 2).

It was found that a higher proportion of moderate/severe anxiety levels in younger residents (p = 0.004), as well as in residents who needed psychological assistance after entering the residence (p = 0.001), used psychotropic drugs (p = 0.006), worked in sectors with suspected/confirmed cases of COVID-19 (p = 0.005) and directly with suspected/confirmed cases (p = 0.03) (Table 3).

In the multiple analysis, it was shown that needing psychological counseling after entering the residency (RPa = 1.48) and using a psychotropic agent (RPa = 1.92) increased the chances of being classified as having moderate and severe levels of anxiety (Table 4).

**Table 1** – Characterization of multiprofessional health residents according to sociodemographic and professional variables and intensity of anxiety, 2020

| Variables | n | % |
|---|---|---|
| Age range | | |
| 21-25 | 44 | 65.70 |
| 26-30 | 21 | 31.30 |
| 31-35 | 2 | 3.00 |
| Gender | | |
| Female | 51 | 76.10 |
| Male | 16 | 23.90 |
| Marital status | | |
| Living alone | 56 | 83.60 |
| Living with a partner | 11 | 16.40 |
| Occupation | | |
| Nurse | 15 | 22.40 |
| Psychologist | 12 | 17.90 |
| Pharmacist | 11 | 16.40 |
| Physiotherapist | 10 | 14.90 |
| Nutritionist | 10 | 14.90 |
| Social worker | 8 | 11.90 |
| Dental surgeon | 1 | 1.50 |
| Residency program | | |
| Adult Intensive Care | 26 | 38.80 |
| Child Health | 23 | 34.30 |
| Cardiology | 13 | 19.40 |
| Psychosocial | 5 | 7.50 |
| Year of residence | | |
| 1st | 35 | 52.20 |
| 2nd | 32 | 47.80 |
| Family income | | |
| Residence scholarship * | 33 | 49.30 |
| 4 to 10 minimum wages ** | 33 | 49.30 |
| < 10 minimum wages | 1 | 1.50 |
| Degree of satisfaction with the residency | | |
| Reasonable/good /excellent | 57 | 85.10 |
| Bad/terrible | 10 | 14.90 |
| Psychological monitoring before residency? | | |
| No | 40 | 59.7 |
| Yes | 27 | 40.3 |
| Psychological help after residency? | | |
| No | 46 | 68.70 |
| Yes | 21 | 31.30 |
| Psychiatric help after entering residency? | | |
| No | 61 | 91.00 |
| Yes | 6 | 9.00 |
| Do you use any psychiatric drugs at this time? | | |
| No | 57 | 85.10 |
| Yes | 10 | 14.90 |
| Beck's Anxiety Inventory | | |
| Minimum/light | 46 | 68.70 |
| Moderate/severe | 21 | 31.30 |

*Note: *Value of the residency grant in 2020: R$3,330.43, with a R$667.00 bonus during the confrontation with the new coronavirus in the country, totaling R$3,997.43 during this period. **Minimum wage in Brazil, in 2020: R$1,045.00.*

**Table 2** – Characterization of multiprofessional residents regarding the harassment variables during service and coping with COVID-19, 2020

| Variables | n | % |
|---|---|---|
| Have you worked directly with suspected or confirmed cases of COVID-19? | | |
| Yes | 45 | 67.20 |
| No | 22 | 32.80 |
| Have you received training for assistance in COVID-19? | | |
| Yes | 52 | 77.60 |
| No | 15 | 22.40 |

To be continued

Table 2 (concluded)

| Variables | n | % |
|---|---|---|
| Do you feel technical and scientific security to work in the COVID-19 sector? | | |
| Yes | 40 | 59.70 |
| No | 27 | 40.30 |
| In your sector, is personal protective equipment available? | | |
| Always | 40 | 59.70 |
| Sometimes | 21 | 31.30 |
| Never | 4 | 6.00 |
| Not applicable | 2 | 3.00 |
| During the pandemic, did you experience harassment? | | |
| Yes | 46 | 68.70 |
| No | 21 | 31.30 |
| Did you suffer sexual harassment? | | |
| Yes | 1 | 1.50 |
| No | 66 | 98.50 |
| Psychological harassment? | | |
| Yes | 25 | 37.30 |
| Não | 42 | 62.70 |
| Bullying? | | |
| Yes | 30 | 44.8 |
| No | 37 | 55.2 |
| Have you suffered any type of violence during your residence? | | |
| Yes | 15 | 22.40 |
| No | 52 | 77.60 |

**Table 3** – Distribution of socio-demographic, professional, health, and coping variables of COVID-19 according to levels of anxiety, 2020

| Variables | Anxiety | | | | *p* |
|---|---|---|---|---|---|
| | Mínimo/ leve | | Moderado/ grave | | |
| | n | % | n | % | |
| Gender | | | | | |
| Female | 34 | 73.91 | 17 | 80.95 | 0.53* |
| Male | 12 | 26.09 | 4 | 19.05 | |
| Age range | | | | | |
| 21-25 | 26 | 56.52 | 18 | 85.71 | |
| 26-30 | 18 | 39.13 | 3 | 14.29 | 0.04** |
| 31-35 | 2 | 4.35 | 0 | 0.00 | |
| Family income | | | | | |
| Residency scholarship only | 25 | 54.35 | 8 | 38.10 | |
| 4 to 10 minimum wages | 21 | 45.65 | 12 | 57.14 | 0.19* |
| < 10 minimum wages | 0 | 0.00 | 1 | 4.76 | |
| Did you require psychological counseling after entering the residence? | | | | | |
| No | 38 | 82.61 | 8 | 38.10 | 0.001* |
| Yes | 8 | 17.39 | 13 | 61.90 | |
| Did you require psychiatric assistance after entering the residence? | | | | | |
| No | 43 | 93.48 | 18 | 85.71 | 0.30* |
| Yes | 3 | 6.52 | 3 | 14.29 | |
| Do you use any psychiatric drugs? | | | | | |
| No | 43 | 93.48 | 14 | 66.67 | 0.006** |
| Yes | 3 | 6.52 | 7 | 33.33 | |
| During your residency, during the COVID-19 pandemic, have you ever suffered bullying? | | | | | |
| No | 28 | 60.87 | 9 | 42.86 | 0.17** |
| Yes | 18 | 39.13 | 12 | 57.14 | |
| Have you suffered any violence during your residency? | | | | | |
| No | 38 | 82.61 | 14 | 66.67 | 0.15** |
| Yes | 8 | 17.39 | 7 | 33.33 | |

To be continued

Table 3 (concluded)

| Variables | Anxiety | | | | *p* |
|---|---|---|---|---|---|
| | Mínimo/ leve | | Moderado/ grave | | |
| | n | % | n | % | |
| Does your sector have suspected or confirmed cases of COVID-19? | | | | | |
| Yes | 24 | 52.17 | 16 | 76.19 | 0.05** |
| No | 22 | 47.83 | 5 | 23.81 | |
| Have you worked directly with suspected or confirmed cases of COVID-19? | | | | | |
| No | 19 | 41.30 | 3 | 14.29 | 0.03* |
| Yes | 27 | 58.70 | 18 | 85.71 | |

*Note: *Chi-square test; **Likelihood ratio.*

**Table 4** – Association of the variables "psychological monitoring" and "use of psychiatric drugs" with anxiety levels among multiprofessional health residents of a university hospital during the COVID-19 pandemic, in a multiple regression model, 2020

| Variables | RP* gross (IC95%) | RP* adjusted (IC95%) |
|---|---|---|
| Did you require psychological counseling after entering the residence? | | |
| No | 1** | |
| Yes | 1.30 (1.02-2.10) | 1.48 (1.01-2.19) |
| Use of psychiatric drugs? | | |
| No | 1** | |
| Yes | 1.80 (1.30-2.20) | 1.92 (1.38-2.67) |

*Note: * Prevalence ratio; ** Reference category.*

## DISCUSSION

There was a prevalence of anxiety among the multidisciplinary health residents in this study. Mainly at moderate and severe levels, which in turn can cause psychosocial and work losses in these individuals in the medium and long term and negatively reverberate in the care provided to COVID-19 patients.

In non-pandemic periods, other studies have estimated the prevalence of anxiety levels in multiprofessional residents[25] and in medical residents[26] in Brazil using the same instrument as used in this study and found, respectively, 28% and 22.9% of moderate and severe levels, rates lower than those found in the present study, which may suggest that the pandemic period increases the intensity of anxiety.

Anxiety levels exacerbate in times of crisis for different reasons in health professionals. Specifically, in times of epidemics and pandemics, adaptive resources are much more required than in times of normality. This context can be perceived among the residents of this study who were working directly with the confirmed and suspected cases of COVID-19, as they had a higher prevalence of moderate and severe levels of anxiety compared to those who were not working directly in the COVID-19 sectors at the time of data collection.

In addition to direct patient care, other studies have documented the participation of nursing residents who worked in popular health education processes with the general population and carried out rapid testing on a *drive-thru* model[27] and residents in public health who trained teams and health professionals for the correct use of personal protective equipment (vest and de-vest) in the context of the pandemic[28]. Therefore, it is noteworthy that these contexts of action add to the fear

that there is a lack of personal protective equipment, work overload, and daily emotional exhaustion due to dealing with various stressors, hopelessness, fear of dying and the death of those close to them and fear of being infected and of infecting others[29], increasing anxiety levels.

Regarding the fear of infection by the new coronavirus, this feeling can be from, for example, by the evidence disclosed in the Epidemiological Bulletin of the Brazilian Ministry of Health that, as of July 4th, there were 173,440 cases of flu syndrome (FS) by COVID-19 in healthcare professionals across the country[30]. Therefore, multiprofessional health residents are required to pay extra attention to the provision of care to patients, including the proper use of personal protective equipment, as well as in compliance with all other institutional protocols, and the managers of the institutions are responsible for ensuring all the apparatus for these residents.

We found that the highest proportion of moderate and severe anxiety levels was present in the youngest residents, which may relate to a shorter time of academic training and less professional experience, added to the initial skill development process during the residency path as a learning space. Psychological disorders and elevated anxious signs are greater in the first year of training of residents, when professionals are adapting to new work routines and, as a result, have greater insecurity in the execution of procedures and less resilience to deal with typical health area problems[31].

The more anxious the individual, the lower his levels of resilience, which is necessary in this pandemic moment as it is resilience that overcomes complex moments or risky situations and ensures the continuity of a healthy emotional development. Resilience is a dynamic process that allows a person to adapt, despite the presence of stressors. It encompasses emotional, cognitive, and socio-cultural mechanisms that reinforce personal attributes, coping strategies, and skills[32]. Thus, part of the multiprofessional residents presented anxiety levels considered minimal and mild; and, despite the stressors and difficulties in the pandemic context, residents use personal, professional, cognitive, and behavioral adaptive models that make them deal with anxiety in a less exacerbated way.

The need for residents who had higher levels of moderate and severe anxiety to have psychological counseling after entering the multiprofessional residency can relate to issues intrinsic to the current model of residencies in Brazil. These consist of a high education/work week of 60 hours per week, between theoretical and practical activities, lasting 24 months, including presentation of reports, rotation in different sectors of the hospital[31]. This mode of execution of health residencies adds to the stressors of the COVID-19 pandemic, triggering high levels of anxiety and the need for psychological support, which can result in absenteeism, higher costs to health services, and permanent consequences on the mental health of the residents[33].

In addition to psychological monitoring, we observed the use of psychotropic drugs by residents who showed higher levels of anxiety. Currently, especially with the modernization of psychiatric drugs and the reduction of their side effects, an increase in their use was noted for the entire Brazilian population. Within health professionals, due to labor demands, the overhead that is normally required at work, as well as the personal factors that allow easier access to the prescription of such drugs, the use of anxiolytics, for example, becomes common[34].

In addition, anxiety can manifest itself in several ways within multiprofessional residents while the COVID-19 pandemic in Brazil lasts. It can also go beyond this pandemic moment, with direct reflections on personal and professional life, which can weaken them and trigger several other maladaptive behavior. Therefore, it is essential that these residents and all other professionals that make up the hospital universe, in which the residency programs are in, prioritize strategies that minimize the triggering factors of anxiety and that envision resilience.

### Study limitations

The main limits of the study are in the characteristics of the adopted method, which portrayed the anxiety levels of the studied population only at the time of the data collection. In addition, it is not possible to establish a cause and effect relationship between the outcome variable and the independent variables. If we did this, reverse causality or bias could incur.

### Contributions to healthcare

Given the importance of multiprofessional health residents in the quality of care during the COVID-19 pandemic, it is important that the health institution and the scientific community know the effects that the pandemic period has for the adaptation of the participants to the anxiogenic effects in order to offer quick and immediate responses in clinical and psychosocial management with a goal of reducing levels of anxiety and other factors that may interfere in the mental health and training of these residents.

## CONCLUSION

It was evident that multiprofessional health residents had high levels of anxiety during the COVID-19 pandemic associated with the following variables: age group, need for psychological support after entering the residence, using psychiatric drugs, working in the COVID-19 sector and directly with suspected and confirmed cases. In the adjusted model, the variables "needing psychological assistance after entering the residence" and "making use of psychotropic drugs" remained. Together, these factors seem to indicate that residents had their mental health impaired during the pandemic; however, maintaining these variables in the model also suggests that they sought help to control anxiety. The question remains as to whether this support comes from institutional worker health policies or if it is part of an individual search.

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