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# STRESS AND ANXIETY IN GENERAL POPULATION IN ROMANIA DURING COVID-19 PANDEMIC

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***Ioana Silistraru[1], Gabriela Cozmanciuc[2], Ștefan Roșca[3], Diana Bulgaru-Iliescu[4], Simona Irina Damian[4]✉, Ioan-Adrian Ciureanu[4]***

*[1] Lucian Blaga University of Sibiu, Sibiu;*
*[2] Clinical Hospital of Sibiu, Sibiu;*
*[3] Dunărea de Jos University of Galați, Galati;*
*[4] Grigore T. Popa University of Medicine and Pharmacy, Iasi, Romania*

✉ *si_damian@yahoo.com*

**ABSTRACT** — The mental health challenges associated with the COVID-19 pandemic overwhelmingly affect the general population. Stress and health anxiety, the risk of losing a job and working at home, online education for children, and isolation have a devastating cumulative effect. This study aims to achieve the following: i) to identify the epidemiological specifics of the perceived stress levels in the general population during the COVID-19 pandemic; ii) to evaluate the correlation between socioeconomic factors and the level of perceived stress and anxiety; iii) to analyze the correlation between the perceived stress scores and the anxiety scores in the general population. We applied Perceived Stress Score (PSS) validated questionnaire and Hamilton Anxiety Scale (HAM-A) online to a group of respondents (N=1.362), profiling the data based on demographics: age, sex, COVID-19 infection, behavior compliance to sanitary limitations, socioeconomic status, and pre-existing health issues. Results show differentiation of PSS values in female and male respondents; occupation significantly influences the perceived stress score among COVID-19 positive respondents. Educational level and income significantly influence the perceived stress score. Low educational level and low income increase the perceived stress score among negative COVID-19 respondents. Subsequent research is needed to clarify other correlations between the perceived stress levels and general population well-being. While certain life conditions enhance the perception of stress, others could provide protective value to demographic groups. Therefore, we suggest further studies and qualitative approaches to general population stress and anxiety during the COVID-19 pandemic.

**KEYWORDS** — stress, anxiety, health, general population, COVID-19.

## INTRODUCTION

Experiencing occasional sentiment of anxiety is a normal part of life. Most of us experience stress and anxiety from time to time. Stress is any stimulus on the brain or body. In general, people say they feel stressed when they have to deal with several competing demands. In addition, some events might trigger stress, which induces frustration and a state of nervousness (Fulga et al., 2019). Nevertheless, the pandemic has added significant stress in our everyday lives and increased the health anxiety levels in the general population (Carfi et al., 2020; Fulga et al. 2020; Tendforde et al., 2020). According to literature, a persistent state of anxiety and stress is responsible for precarious health and aggravation of existing illnesses (Brand et al., 2010).

## METHODS

For the study, we selected a group within the general population based on consent. Then, we applied online a validated questionnaire, PSS Scale (The PSS Scale, reprinted with permission of the American Sociological Association, from Cohen et al., 1983) to 1.362 respondents. The Hamilton Anxiety Scale (HAM-A, 1959) was one of the first evaluation scales developed to measure the severity of anxiety symptoms, still used in both clinical practice and research. The scale's 14 items define by a series of symptoms and measure mental anxiety (mental agitation and psychological distress) and somatic anxiety (physical complaints related to anxiety) (Thompson, 2015). Data were analyzed using IBM SPSS Statistics 26 software, both descriptive and analytical.

The independent variables were tested depending on the type and characteristics of the data. For example, we use the parametric inferential method at a normal distribution at the sample level- respectively ANOVA with a single intergroup factor (OneWay Anova). If the assumption regarding the normality of the distribution is not fulfilled, we use nonparametric inferential methods, respectively, the generalized U test. The data homogeneity was proved through a Levene test (results show $p > 0.05$, 95% CI). For the comparative analysis, we apply the OneWay Anova test (95% CI). The significance level (p-value) (maximum error probability) was calculated at an accurate value of 0.05 (5%) and the probability (confidence intervals) at 95%, validating the approach. We apply the Chi-square test in the case of nonparametric analysis and Pearson test as significance test $\chi^2$.

## RESULTS

The demographic analysis indicates an increased frequency of female respondents, 85.02% women and 14.98% men. The study group presents a normal distribution of respondents in terms of age; the maximum frequency of cases corresponds to the age group 41–50 years (35.17%). Age in the study group showed maximum values of 84 years and a minimum of 18 years, 75% of cases with values greater than 38 years, of which 25% were older than 53 years. Socioeconomic aspects can significantly impact stress levels and anxiety, significantly interfere with lifestyle (smoking, alcohol consumption), and have substantial health implications.Regarding the status of COVID-19 infections, out of the 1,362 respondents, 15.42% were infected with SARS-CoV-2, and 84.58% were not infected. For 210 COVID-19 positive respondents (age range from 21 to 72 years), the mean age was 43.60 years (standard deviation = 10.18), registering a slightly higher average value for rural male respondents (50.50 vs. 42.34 years). For COVID-19 negative respondents (1.152), the age ranged from 18 to 84 years; the mean age was 45.79 years (standard deviation = 10.97), with no significant differences between the mean values. the comparison of the two categories of respondents, the mean age was significantly higher in COVID-19 negative respondents (45.79 vs. 43.60 years; p = 0.959)

Respondents infected with SARS-CoV-2 accounted for 15.42% of the total respondents, with the following epidemiological characteristics: 83.3% were female, respectively 16.67% male, of which 97.41% were under 65 years of age; respondents are mainly urban in 86.67% of cases and 13.33% of rural origin. Conversely, respondents not infected with SARS-CoV-2 accounted for 84.58% of the total respondents, with the following epidemiological characteristics: 85.33% were female, respectively 14.67% male, of which 94.97% were under 65 years of age; respondents are mainly urban in 86.55% of cases and 13.45% of rural provenience.

One aspect relevant to the study was observing sanitary regulations of isolation upon infection and general lockdown rules. In this regard, the data obtained within the COVID-19 positive group show that 15.42% of COVID-19 positive respondents observed the 14 days self-isolation rule. On the other hand, data collected from the 84.58% negative COVID-19 respondents regarding the ten-day self-isolation rule in case of contact with a confirmed case show that only 63.80% of the COVID-19 respondents followed the isolated stay recommendations. In both the positive and negative COVID-19 groups, we identified homogeneity between sexes, backgrounds, and age variables related to the behavior on isolation recommendations. COVID-19 positive respondents, who did not follow the quarantine/isolation recommendations, represent 36.19% of the total number of infected respondents: 6.67% men and 29.52% women; 35.71% under 65 years of age and 0.48% over 65 years of age; 30.48% urban patients and 5.71% rural provenience. Among the COVID-19 positive respondents, 31.60% stated that they had deaths in the family or acquaintances caused by SARS-CoV-2, respectively 31.59% of the COVID-19 negative respondents.

With regards to identified stress values, the stress score (PSS scale) vs. the sex of the patients indicated the presence of a significant association ($\chi^2 = 71.20$, $p << 0.008$, 95% CI between the sex of the respondents and the perceived stress score. The female population (39,52%) presents higher scores of perceived stress (PSS 29–37) compared to 7,14% of the male population within the same range of high score, and 33,33% of female respondents reported a very high-stress score (PSS > 38), compared to 6,67% of male respondents.

The mean values of the perceived stress score in female respondents (35.35 ± 5.87) is slightly higher than that of male respondents (35.02 ± 6.13) among COVID-19 positive respondents.Respectively, in COVID-19 negative respondents, the mean values of the perceived stress score in female respondents (24.75 ± 6.62) are significantly higher than those in male respondents (22.00 ± 6.80). The values in both groups were homogeneous (FLevene = 0.12, p = 0.72 vs FLevene = 0.16, p = 0.68)

HAM-A scores show a higher level of anxiety for 47,14% of female respondents with SARS-COV-2 infection, while 8,57% of male respondents present similar scores. Conversely, anxiety levels decreased for respondents who had no infection — 28,73% of the female respondents and 3,81% of male respondents fit the higher level anxiety category.

## DISCUSSION

Higher values of perceived stress score are associated with higher levels of stress and indicate a higher likelihood of interfering with issues such as lifestyle challenges, such as compliance to sanitary regulations during the COVID-19 pandemic. In addition, higher scores in PSS are associated with an increased vulnerability to compromised health, especially if additional stressors are present (loss of a job, end of a relationship, death of a loved one). Finally, higher scores are also associated with increased exposure to stress-induced and psychosomatic diseases.

Anxiety, on the other hand, is either a fear or a sentiment of worry. Anxiety disorders include pathologies, which have typical characteristics of excessive fear and anxiety and associated behavioral disorders. Fear

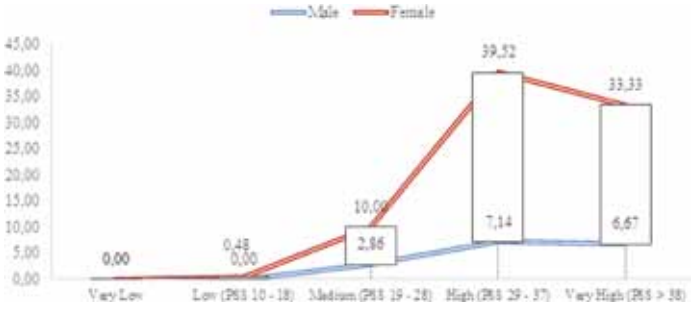


***Fig. 1.*** *Perceived Stress Scores in positive COVID-19 respondents by sex*

***Table 1.*** *PSS values comparison tests*

| Test | F (95% confidence interval) | p |
|---|---|---|
| COVID-19 positive | | |
| Levene Test of Homogeneity of Variances | 0,122 | .727 |
| ANOVA (Analysis of Variance) | 0,088 | .767 |
| COVID-19 negative | | |
| Levene Test of Homogeneity of Variances | 0,169 | .681 |
| ANOVA (Analysis of Variance) | 24,747 | .000 |

***Table 2.*** *HAM-A scores based on sex and COVID-19 status*

| | COVID-19 positive | | | | COVID-19 negative | | | |
|---|---|---|---|---|---|---|---|---|
| HAM-A | F | % | M | % | F | % | M | % |
| 0–4 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 |
| 5–10 | 2 | 0.95 | 0 | 0.00 | 157 | 13.62 | 57 | 4.94 |
| 11–16 | 74 | 35.23 | 17 | 8.09 | 495 | 42.96 | 68 | 5.90 |
| +17 | 99 | 47.14 | 18 | 8.57 | 331 | 28.73 | 44 | 3.81 |

is the emotional response to a real or imminent threat, while anxiety anticipates a future threat. These two states can overlap, but they differ, with fear more often associated with the fight or flight response of the body, thoughts of immediate danger, and escape behavior. Anxiety is more often associated with muscle tension and alertness to prepare for possible danger and precautionary or avoidant behavior. Therefore, evaluating stress and anxiety levels in the general population is necessary, and literature suggests it should be considered as an overall indicator in public health.

The COVID-19 pandemic has effects that are still impossible to estimate globally regarding people's lives and national economies. Even outside the strictest quarantine periods, life contexts are difficult to map from the general population's mental health. Studies conducted so far indicate significant effects on the population's well-being, with specific local demographic and socioeconomic variations, but with a common trunk of manifestations in mental health. The prevalence of depressive episodes, anxiety, and panic attacks affect the population regardless of the severity of the disease — whether or not a person has had COVID-19.

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