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ORIGINAL ARTICLE

INFLUENCE OF SOCIO-DEMOGRAPHIC FACTORS ON PERCEIVED STRESS IN OUTPATIENTS WITH DEPRESSION AND ANXIETY IN REMISSION DURING THE COVID-19 PANDEMIC

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Abstract. Objective: *The study aimed at identifying the influence of socio-demographic factors on perceived stress during the first and the second "waves" of the COVID-19 pandemic among patients with depression and anxiety in remission compared to controls.* ***Method:*** *The study was designed as case-control, cross-sectional and non-interventional, and included 60 outpatients with depressive and anxiety disorders in remission and 60 controls with or without family history of affective disorder. A self-assessment scale (Perceived Stress Scale, PSS-10) was used to evaluate perceived stress. The remission was objectified by the Clinical Global Impression scale (CGI-S ≤ 2) and a questionnaire about the socio-demographic features and clinical characteristics of the disorders was completed.* ***Results:*** *By using multiple logistic regression, it was found that the diagnostic category and/or the relevant family history did not predict higher levels of perceived stress during the COVID-19 pandemic ($p > 0.05$). Females were associated with higher risk of moderate or high stress (OR = 2.613, $p = 0.017$), as well as those working from home during the pandemic (OR = 4.00, $p = 0.026$).* ***Conclusions:*** *Addressing the COVID-19 effects on mental health in a biopsychosocial manner, the study shows the impact of socio-demographic factors such as gender and work environment in times of a psychosocial crisis. The lack of differences in stress perception by the patients in remission and healthy controls implicates the importance of adequate maintenance treatment and easy access to mental health services in times of crisis.*

Key words: *psychological stress, COVID-19, anxiety disorders, depression, remission, outpatients, socio-demographic factors*

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INTRODUCTION

During the past few years, the COVID-19 pandemic has turned not only into a serious medical problem with its direct impact on physical and mental health but has also led to enormous economic and socio-psychological consequences, which have mediated the higher need for long-term mental health services. The pandemic, with its characteristics of a global crisis, is an example of the complex inter-

action between the factors integrated into the biopsychosocial model of mental disorders. During a crisis, perceived stress is a process that depends on the subjective assessment of the particular event, its duration, and the individual coping mechanisms in terms of genetic predisposition and vulnerability [1, 2].

Factors such as isolation, lack of social interaction, and some restrictions on personal freedom are serious stress factors that could give rise to different psychological problems in people with mental disorders as well as the general population. A number of authors claim that the main risk factors for the emergence of depressive and anxiety symptoms in the general population do not differ from the risk factors in those who suffer from mental disorders [3]. Psychosocial stress is a universal risk factor for the occurrence or relapse of a mental disorder. In a previous study, it has been found that people in stable remission of depressive and anxiety disorder do not differ from controls in terms of anxiety and perceived stress during the COVID-19 pandemic [4].

STUDY OBJECTIVE

The study objective was to identify the levels of perceived stress within the risk groups of patients with mental disorders in complete remission and compare them to those in healthy controls, and to determine the complex impact of the COVID-19 pandemic-related socio-demographic factors on perceived stress. The indirect influences of the COVID-19 pandemic and the existence or non-existence of a psychiatric diagnosis, operating as a risk factor for the psychological perception of stress, were analyzed.

MATERIALS AND METHODS

The study was designed as case-control, cross-sectional and non-interventional, and a part of a larger one that included a sample, recruited from July 2020 to October 2020 in the outpatient service of the Psychiatric clinic of „Aleksandrovska“ University Hospital in Sofia, Bulgaria. A total of 120 individuals were included – 30 patients with depressive disorder in remission (MDD-R), 30 patients with anxiety disorder in remission (AD-R), and 60 healthy controls – 30 first-degree relatives of the patients with history of depressive or anxiety disorder (HC-FDR) and 30 without a family anamnesis (HC). The participants in the study were aged 18 or older and had not been affected by COVID-19 until the beginning of the study. The patients had been previously diagnosed to suffer from depression (F32, F33) and anxiety disorder (F4), as defined by the diagnostic criteria of ICD-10, and were currently in remission. Clinical remission was defined as a stable condition, with a duration of at least 6 months which does not imply a change in the maintained treatment and is objectified by the Clinical Global Impression scale – Severity (CGI-S) with a score of 2 or lower.

For the purposes of the study, a self-administered questionnaire, which was investigating demographic factors, educational level, professional engagement, disease-related variables (only in the patient’s groups), lifestyle and its changes during the COVID-19 pandemic, and social and family support was completed.

The level of perceived stress in terms of the COVID-19 pandemic was evaluated by the PSS-10 (Perceived Stress Scale – 10-point scale [5]). Values from 0 to 13 indicated low level of stress, these from 14 to 26 – moderate level of stress, and values from 27 to 40 – high level of stress. The scale evaluated not only the stressogenic event but also the patient’s subjective perception of it.

Participants responded to a single question about receiving support. They were asked how much they agreed with the statement: “I receive the social and emotional support that I need” on a scale from strongly disagree (1) to strongly agree (5) [6].

All controls – including healthy controls and first-degree relatives of patients with depressive or anxiety disorders, were recruited randomly but matched for age and gender with the patients in remission. After applying the inclusion criteria, the questionnaire and self-assessment scales were completed on the day of the examination in the outpatient service by an independent psychiatrist, who was not familiar with the patients to avoid bias. All eligible patients were recruited consecutively after an oral and written understanding of the objectives of the study and completed written informed consent form. The Ethics Commission on Scientific Research at the Medical University of Sofia approved the study (Protocol No. 4298/ 03/07/2020).

Statistical analysis was performed by using the IBM SPSS Statistics 25.0. The level of significance, at which the null hypothesis was rejected, was accepted at $p < 0.05$. Descriptive methods for distribution of the considered variables, nonparametric tests of Kolmogorov-Smirnoff and Shapiro-Wilk for testing the distribution of normality, the ROC curve (a receiver operating characteristic curve) analysis for determining the threshold values of quantitative variables and multiple logistic regression analysis to define the influence of the studied factors were performed.

RESULTS

The research consisted of 120 people, divided into four groups, each one accounting for 25% of the sample – patients with AD-R (n=30), MDD-R (n = 30), HC (n = 30), and HC-FDR (n = 30). The patient's groups did not differ by age from the control groups and AD-R patients were significantly younger than MDD-R patients ($p < 0.001$). The mean age of the patients was 44.66 ± SD 14.5. Most were female (61.7%), married (50.8%), employed (80%), and had Bachelor's degree or higher level of education (75%). Gender, age, psychometric and socio-psychological factors among the studied groups are presented in Table 1.

The main score of perceived stress, measured by the PSS-10 was 16.07 ± 6.32. Two categories in terms of levels of stress were created – normal stress, which was encountered by 31% of the patients (PSS score ≤ 13), and medium or high stress, which was observed in 69% of the patients (PSS score ≥ 14). A regression model was performed to analyze the impact of socio-demographic factors on the perceived stress during the COVID-19 outbreak.

For the quantitative factors that have a distribution different from the normal, ROC curve analysis was performed in search of significant threshold values that define patients with or without perceived stress. Age (area under the curve (AUC) = 0.590, $p = 0.111$), social support (AUC = 0.581, $p = 0.151$) and hours of work per week (AUC = 0.551, $p = 0.374$) did not reach statistically significant threshold values.

The significant socio-demographic factors which increase the level of perceived stress, found in multiple logistic regression, were gender and working hours with the restrictions during the first COVID-19 "wave". There was a 2.6-fold higher risk of developing medium/high stress levels in women compared to men

Table 1. Comparative analysis of socio-demographic factors and levels of stress of the studied groups

	AD-R	MDD-R	HC	**HC**-FDR	Statistics
Age $\overline{X}$ ± SD	37.93 (± 8.971)	51.43 (± 14.431)	43.73 (± 15.456)	45.53 (± 15.511)	AD-R/MDD-R Independent samples t-test, F = 5.606, df = 58, p < 0.001 Mann-Whitney p = n.s.
Gender n (%)					
Male	12 (40)	9 (30)	12 (40)	13 (43.3)	Pearson Chi-square test = 1.269; df = 3; p = 0.810
Female	18 (60)	21 (70)	18 (60)	17 (56.7)	
Education n (%)					Pearson Chi-square
Higher	20 (66.7)	23 (76.7)	25 (83.7)	22 (73.3)	Test = 2.311
Secondary	10 (33.3)	7 (23.3)	5 (16.7)	8 (26.7)	Df = 3; p = 0.537
Professional engagement n (%)					Pearson Chi-Square test = 5.417a; df = 3; p = 0.173
Yes	26 (86.7)	21 (70)	27 (90.0)	22 (73.3)	
Retirement					Pearson Chi-Square test 9.526
Yes	0 (0)	7 (23.3)	3 (10.0)	7 (23.3)	df = 3; p = 0.022
PSS $\overline{X}$ ± SD	14.97 (± 6.060)	17.10 (± 7.581)	16.13 (± 4.967)	16.07 (± 6.528)	ANOVA F = 0.565; df = 3; p = 0.639
Stress n (%)					
Low	13 (43.3)	7 (23.3)	9 (30.0)	8 (26.7)	Fisher-Freeman-Halton Exact Test = 5.186, p = 0.530
Moderate	16 (53.3)	19 (63.3)	20 (66.7)	20 (66.7)	
High	1 (3.3)	4 (13.3)	1 (3.3)	2 (6.7)	
Work during isolation n (%)					
Yes (office)	12 (40.0)	8 (26.7)	11 (36.7)	17 (56.7)	
No	12 (40.0)	15 (50)	7 (23.3)	8 (26.7)	Pearson Chi-Square test = 11.271; df = 6; p = 0.080
Yes (home office)	6 (20.0)	7 (23.3)	12 (40)	5 (16.6)	
Hours/working week $\overline{X}$ ± SD	31.38 (± 15.347)	26.17 (± 18.321)	35.67 (± 15.687)	28.50 (± 18.530)	Kruskal-Wallis H test = 8.469; d f= 3; p = 0.037
Family support n (%)					Fisher-Freeman-Halton Exact Test = 0.380, p = 1.000
Yes	25 (83.3)	26 (86.7)	26 (86.7)	25 (83.3)	
Social support $\overline{X}$ ± SD	4.03 (± 0.928)	3.43 (± 1.073)	3.90 (± 0.803)	3.90 (± 0.803)	Kruskal-Wallis H test = 6.129; df = 3; p = 0.105

(OR = 2.613, p = 0.017). Working from home, compared to unemployment increased 4 times the risk of medium/high stress (OR = 4.00, p = 0.026). The comparison of the influence of working from the office to unemployment in terms of perceived stress showed no statistically significant difference. The values of the odds ratios and their statistical significance remained nearly the same after performing an adjusted regression model with the two significant factors – gender and work environment. The psychiatric diagnosis or the family history of it (anxiety or depressive disorder) did not reach statistical significance in terms of predicting higher levels of stress (p > 0.05) (Table 2).

DISCUSSION

The present study covers the period after the first COVID-19 lockdown, meaning the isolation, which was characterized by some stabilization of the situation, after a period of forced isolation, restrictions, conflicting messages, and lack of sufficient information. This period was chosen to integrate all coping mechanisms for adapting to the situation.

In this study, we found no difference in the level of perceived stress, not only between the two diagnostic groups and controls but also in the HC-FDR group, in which we hypothesized the probable genetic vulnerability and the specific psychosocial factors, different from those in the general population (living and/or taking care of people with mental illness). In a previous study, we found that patients in remission have similar self-assessment of anxiety, stress levels, and loneliness when compared to healthy controls [4]. These outcomes are partly in contrast with other published results that a history of mental illness is a risk factor for exacerbation of anxiety and depression during the COVID-19 pandemic [7, 8, 9]. However, there are other studies suggesting that past psychiatric history is not a cause for a different perception of stress in comparison to controls [10, 11]. Considering the results from the current study we conclude that the stability of the remission is an important protective factor in terms of subjective feelings of perceived stress. Therefore, good control of the clinical features of affective disorders and achievement of a steady remission state make the patients resilient as much as the controls in times of serious psychosocial stress, such as the COVID-19 pandemic.

Another explanation for the absence of variation between the patients with history of affective disorders and controls could be the characteristics of the COVID-19 pandemic as a global crisis that affects everyone. It was reported that the perceived stress, anxiety, depression, and insomnia were not connected with educational level, age, and gender, which is a proof that all sectors of society were affected enormously by the pandemic [12]. Although the perceived stress during the COVID-19 outbreak could be an individual risk factor for relapse in patients with depression or anxiety, it could also be a cause for emerging emotional problems. Monitoring the consequences of this long-term crisis has important practical implications for the prevention of psychological problems, no matter the past psychiatric history of the individual.

The literature research shows that the levels of stress in the general population due to the COVID-19 are substantial and are influenced by a complicated interplay between the current crisis and socio-demo-

Table 2. Odds ratios and 95% CI of the investigated socio-demographic factors as stress predictors

Socio-demographic factor	Comparison	Single				Multiple			
		OR	95% CI		p	OR	95% CI		p
			Lower limit	Upper limit			Lower limit	Upper limit	
Gender	Female/Male	2.613	1.190	5.738	0.017	2.589	1.151	5.826	0.021
Working during the isolation	Yes, work from the office/No	0.939	0.401	2.198	0.885	0.970	0.405	2.323	0.946
	Yes, work from home/No	4.000	1.177	13.591	0.026	4.034	1.162	14.012	0.028
Education	Secondary/Higher (Bachelor or Master's degree)	1.167	0.476	2.857	0.736				
Professional engagement	Yes/No	1.650	0.657	4.145	0.286				
Retired	Yes/No	0.920	0.525	1.611	0.769				
Family support	Yes/No	0.547	0.167	1.787	0.318				
Diagnosis	FDR-HC/HC	0.857	0.288	2.547	0.781				
	AD-R/HC	0.560	0.193	1.623	0.286				
	MDD-R/HC	1.408	0.445	4.453	0.560				

graphic factors. The focus on subjective stress assessment has huge significance in an attempt to define the coping mechanisms in times of stress [5]. The mean scores of perceived stress in our sample of patients in remission and controls (PSS-10 – 16.07 ± 6.32) are similar to the results from the general population [13]. Perceived stress is analyzed as a dichotomous value [14] and in our sample, only 1/3 of the participants considered themselves as people with normal stress levels.

In our study, no difference between the four studied groups in terms of gender, education, professional engagement, and social and family support was found. Significantly more people in the groups of MDD-R and HC-FDR were retirees. A possible explanation could be the higher age in these groups. Although retirement is mostly due to health problems or older age, it is not a definite obstacle to professional engagement. Another significant variation was found in the working hours per week, in which HC-FDR has fewer hours in comparison to HC. Some common characteristics of the MDD-R group and a probable disturbance in professional functioning were assumed. Professional impairment could be a part of the residual depressive symptoms due to possible cognitive deficits even in times of remission [15]. Therefore, it is difficult to evaluate whether the reduced working week hours are only a result of the pandemic situation.

The age differences between AD-R and MDD-R are probably due to the earlier onset of anxiety disorders in the general population in comparison to recurrent depression and the chance to complete a remission state at a younger age when applying a particular treatment [16, 17]. There are contradictory findings from a variety of researchers in terms of the level of perceived stress and age. According to some, the level of stress increases with age [2, 18], but most of the data suggest the opposite [19]. A systematical analysis of 19 studies, including 93,569 people in 8 countries [20] and findings from a survey in 41 countries [13] shows that younger age and female sex were at risk for higher levels of PSS-10 in the general population at the time of COVID-19. We found no statistically significant threshold for an age that differentiated people with or without stress, but the result of the study confirmed that the female sex is a risk factor for a higher risk of stress. We support the possible explanation, indicated by previous literature, that women have better verbalization and probably insight about emotions and distress [21] and their key role as the main caregivers in the family, which accounts for higher stress levels and vulnerabilities during times of crisis [22].

Regarding the influence of the working environment on perceived stress, this study shows that working from home increased the likelihood of moderate/high stress during pandemic four times. These outcomes shed light on the possible adaptation mechanisms that are required in the rapidly changing economic field and the transition from ordinary everyday working habits. This rapid transition is probably the cause of high levels of stress, which are not observed when working in the normal environment in the office and even in comparison to unemployment. We assumed that at the core of these findings are not only the effects of economic instability but also the effects of isolation and the loss of important relationships outside the family. Moreover, people had to cope simultaneously not only with the work challenges but also with family responsibilities and taking care of children, who were studying online during the COVID outbreak. This could be also related to the other result of the study indicating that women had higher levels of stress during the pandemic due to loss of role boundaries and overlapping between the private and professional aspects of life. In the cultural context of our research, women were the primary caretakers in the family and most of them were working, which implies higher levels of stress in this time of worldwide crisis. A study was carried out to explore the influence of different constructs of working from home on the quality of life and it has confirmed the role of isolation in higher levels of perceived stress, which has a negative effect on the quality of life. In terms of workload and having young children on perceived stress, these results were higher for women [23].

There are direct and indirect psychological and social consequences of the pandemic, which could affect mental health in the intermediate and long run [24]. This suggests implications for future research with the aim to observe the effects of the pandemic in prospective studies. Regarding limitations and future directions, the obtained sample may not be representative of the general population as the sample was formed by the outpatient service of one medical institution. The study includes mainly the urban population living in the capital, suggesting a higher level of professional and social functioning and more opportunities for compensation in psychosocial terms. The cross-sectional nature of the data allowed us to investigate the psychological effects of the COVID-19 outbreak at a cut-off point of the pandemic.

In conclusion, the present study contributes to addressing the effect of the COVID-19 pandemic on mental health in outpatients with depressive and anxiety disorders. The psychological impact and the perceived stress from the pandemic situation depend on

multiple socio-demographic factors, such as gender and work environment. Moreover, achieving a stable remission in people with affective disorders is a protective factor in times of crisis and implies preventive strategies and provision of resources for easy access to mental health services.

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