Ruminations as predictors of post-traumatic stress disorder after hospitalization for Covid-19

Zygfryd Juczyński[1], Luiza Kwiecińska[2], Nina Ogińska-Bulik[3]

[1]WSB Merito University in Torun
[2]University of Social Sciences in Lodz
[3]University of Lodz

Summary

Aim. The most widely reported problems among people who have been hospitalized for COVID-19 are those associated with mental health. The aim of the study was to determine the incidence of PTSD in patients hospitalized due to COVID-19 and to determine predictors of the risk of its occurrence.

Material and methods. The study group included 250 people after hospitalization due to COVID-19. Several standardized measurement tools were used: the PCL-5, PSS-10, ERRI, SPP-15, and PANAS.

Results. Overall, 55.6% of respondents qualified for a diagnosis of PTSD. These were mostly people hospitalized for more than two weeks, with a more severe course of the disease, examined within three and six months after hospitalization. The regression model includes factors related to the course of treatment and psychological variables: some increase the risk of PTSD (i.e., perceived stress, intrusive ruminations and negative emotions), while others are protective factors (i.e., resilience, deliberate ruminations and positive emotions). Overall, the regression model explains 72% of the total variance. Intrusive ruminations, explaining 59% of the variance, and perceived stress (12%) appeared the most significant for predicting PTSD.

Conclusions. As patients diagnosed with PTSD require therapeutic assistance, it is essential to identify both risk and protective factors as these may be helpful in improving the therapy process and facilitating preventive activities.

Key words: PTSD, ruminations, COVID-19

Introduction

PTSD symptoms as a consequence of the Covid-19 experience

The COVID-19 pandemic has impacted almost all of us. Everyone has encountered the restrictions, and many have experienced the disease personally, which for many ended

tragically. Previous studies confirm the existence of a variety of mental health problems in those infected with coronavirus, including symptoms of post-traumatic stress disorder (PTSD). A meta-analysis of studies from different countries and including people hospitalized for SARS-CoV-2 showed the incidence of PTSD in approximately 30% [1].

Many researchers have started to monitor the occurrence of PTSD symptoms resulting from COVID-19, highlighting their coexistence with other mental problems [2]. A review based on studies conducted in eight countries (China, Denmark, Spain, Italy, Iran, USA, Turkey and Nepal) showed relatively high rates of symptoms of anxiety (from 6.3% to 50.9%), depression (14.6%–48.3%), post-traumatic stress disorder (7.0%–53.8%), stress (8.1%–81.9%) [3, 4]. The severity of PTSD symptoms ranged from relatively low (9–10%) to moderate (45%) and even very high (96.2%), depending on the factors related to the course of the disease [5]. The occurrence of PTSD after acute COVID-19 infection was confirmed more often in women (55.7%), and in patients with mental disorders in anamnesis (34.8%) [6].

Hospitalization for COVID-19, which is generally associated with a more severe course of the disease, has a negative impact on mental health and well-being. In addition, the uncertain prognosis and treatment, as well as the specific nature of hospitalization, i.e., staying in isolated wards, with limited contact with guests and healthcare workers, are additional sources of stress. Pursell et al. [7] emphasize that in-hospital isolation measures commonly used during a pandemic also increase the risk of anxiety and depression.

Factors determining the occurrence of PTSD

Not every person exposed to traumatic events develops the disorder after traumatic stress. The occurrence of PTSD is determined by various factors that increase susceptibility, and by other protective factors that reduce the risk of its occurrence. Gender turns out to be the most important of the sociodemographic variables. Most studies indicate that women are more prone to developing PTSD than men [9].

Psychological factors are of great importance in the development of PTSD, including the individual resources, both personal (in the form of beliefs and expectations) and social ones (social support). In other words, deficits in terms of beliefs and expectations, including low self-esteem, self-efficacy, coherence, resilience, and a low level of life optimism can increase susceptibility to PTSD. A similar role seems to be played by the lack of social support and social isolation. Susceptibility to PTSD may also increase the severity of pre-existing mental disorders, including anxiety, depression and substance abuse [6, 9, 10].

However, the main determinants of PTSD seem to be the severity of stress and the undertaken remedial activity. In general, the stronger the stress and the greater the coping deficits, the greater the likelihood of developing PTSD [10].

A special role in the development of PTSD is played by the cognitive-emotional processing of trauma. Its importance has been indicated by many researchers [11–13].

One of the indicators of cognitive processing of trauma is ruminating about the experienced traumatic situation. The role of ruminations in the development of post-traumatic stress disorders is emphasized by the cognitive model of PTSD developed by Ehlers and Clark [14]. The authors propose that assessing an experienced event as a threat generates negative emotions and encourages constant rumination about it (i.e., chewing over your thoughts). This situation is conducive not only to the development of PTSD symptoms, but also to their maintenance [15–17].

Previous studies have also identified factors that may protect or reduce the severity of PTSD symptoms. One of them may be resilience, understood as the ability of an individual to detach oneself from negative experiences and flexibly adapt to changing living conditions [18, 19]. Resilience is associated with the presence of positive emotions, as well as other personal resources, such as self-esteem and self-efficacy, and this increases the effectiveness of coping with traumatic events [10]. Connor [20] highlights the importance of resilience as a factor reducing PTSD symptoms. A study by Wren et al. [21] in an inner-city sample of primary care patients found resilience to be robustly and significantly associated with a decreased likelihood of PTSD.

So far, little research has been conducted on the role of psychological factors in promoting and protecting against the development of PTSD related to COVID-19. These symptoms are believed to be exacerbated by severe mental stress at the onset of the disease and the resulting stay in the intensive care unit [22]. A diagnosis of PTSD has been confirmed in 36% of convalescents after leaving hospital [23]. Higher risk was predicted by a lower level of education, higher level of anxiety and perception of poor social support during hospitalization [23]. Currently, no studies have addressed the importance of ruminations about the experienced disease and the role of resilience in the development of PTSD symptoms in connection with COVID-19.

Aim

The aim of the present study was to determine the severity of the symptoms of post-traumatic stress disorder in people hospitalized due to COVID-19. Based on the available studies, it was assumed that the severity of PTSD symptoms depends on factors related to the course of treatment in hospital, as well as psychological variables such as perceived stress, ruminations, experienced emotions, and resilience. Referring to the cognitive PTSD model [14], it was assumed that perceived stress, ruminations and negative emotions would be positively associated with PTSD symptoms. On the other hand, it may be expected that positive emotions and resilience will be negatively associated with the symptoms of this syndrome.

Material and methods

Study participants

The study included patients hospitalized in the period from April to July 2021 due to COVID-19 in the central part of Poland. All of them agreed to participate in the research after hospitalization. As a result, they were all provided with electronic or paper versions of the research tools, with one half receiving the tools three months after the end of hospitalization and the other after six months.

A total of 250 (out of 320 submitted) correctly completed tools, 49.6% electronic and 50.4% paper versions of the questionnaires, were obtained. Among the respondents, 40% were men, 54.4% were under 50 years of age, 58.4% stayed in the hospital for up to two weeks, the rest for more than two weeks. In 51.6% of cases, the respondents completed questionnaires three months after discharge from hospital ($M = 3.1 \pm 1.6$), others after six months ($M = 6.2 \pm 1.4$).

Research tools

Each participant was asked to answer several questions about age, sex, comorbidities, length of stay in hospital, treatment and then to complete several questionnaires. The instructions for individual questionnaires specified that the answers should take into account one's reactions, emotions and behaviors related to hospitalization for COVID-19.

PTSD Checklist for DSM-5 – PCL-5

PTSD Checklist for DSM-5 (PCL-5), created by Weathers et al. [24], was previously adapted to the Polish conditions [25]. It contains 20 items related to the four PTSD criteria according to the DSM-5, i.e., B. reexperiencing, C. avoidance, D. negative alterations in cognitions and mood, E. alterations in arousal and reactivity. The respondent indicates to what extent the described problems troubled him/her during the last month, and marks his/her answers on a 5-point-scale ranging from 0 ("not at all") to 4 ("extremely so"). PCL-5 showed good psychometric properties in the tested sample, with Cronbach's α of 0.96, and temporal stability $rtt = 0.89$.

Perceived Stress Scale – PSS-10

The *Perceived Stress Scale* (PSS-10), developed by Cohen et al. [26], in Polish adaptation [27] assesses the degree to which the experiences of the last month were unpredictable, uncontrolled and excessively stressful. The 10-item scale showed good psychometric properties (Cronbach's $\alpha = 0.86$).

Event Related Rumination Inventory – ERRI

The *Event Related Rumination Inventory* (ERRI) was developed by Cann et al. [28], and adopted to Polish condition [29]. The tool contains two scales, each consisting of 10 statements. The first relates to intrusive ruminations, the second to deliberate ruminations. The respondent provides an answer on a 4-point Likert scale. The inventory showed very good psychometric properties (Cronbach's $\alpha = 0.96$ for intrusive rumination and 0.92 for deliberate ruminations).

Positive and Negative Affect Schedule – PANAS

The *Positive and Negative Affect Schedule* (PANAS), in Polish version [30] is used to measure the intensity of negative and positive emotions. Based on a list of 20 adjectives, the respondent evaluates his/her relatively constant affective characteristics on a scale of 1 ("I never feel this way") to 5 ("I usually feel this way"). The reliability of the three scales ranges from 0.79 to 0.74.

Resilience Measurement Scale – SPP-15

The Resilience Measurement Scale (SPP-15) is a shortened version of the SPP-25 scale developed by Ogińska-Bulik and Juczyński [31]. The scale measures the general level of resilience, treated as a personality traits. The respondent provides an assessment on a 5-point Likert scale (from 0 – "definitely not," to 4 – "definitely yes"). The scale has good psychometric properties (Cronbach's $\alpha = 0.89$ for the entire scale).

Results

Data analyses were carried out using the SPSS statistical package (version 20). The distributions of the variables were checked for normality on the basis of skewness and kurtosis assessment. Descriptive statistics were calculated, and relationship between the variables were calculated using Pearson's correlation coefficient. The models were verified by linear regression analysis (step method).

Descriptive analysis

The PTSD symptoms related to Covid-19 were assessed using the PCL-5. The respondents assessed the occurrence of the listed problems in the last month in relation to hospitalization due to Covid-19 (Criterion A). The obtained results are presented in Table 1.

Table 1. **Means and standard deviations for PCL-5 scores**

PCL-5	cat. no.	SD	skewness	kurtosis
B. Intrusion	8.94	5.21	0.03	-0.98
C. Avoidance	3.64	2.42	-0.13	-1.06
D. Alterations in cognitions and mood	11.17	6.40	0.01	-1.01
E. Alterations in arousal and reactivity	10.80	5.37	0.02	-0.88
PCL – Total score	34.55	17.29	-0.07	-0.98

There was no statistically significant difference in the results in relation to the study method (on-line or paper version of the questionnaires). Higher results ($p < 0.05$) were recorded in women ($M = 36.16 \pm 16.70$), compared to men ($M = 31.62 \pm 17.80$) and in younger respondents (up to 50 years; $M = 36.84 \pm 16.92$), compared to older ones ($M = 31.81 \pm 17.40$). Significantly lower PTSD results ($p < 0.01$) were found in patients hospitalized for a shorter period (up to 2 weeks; $M = 32.06 \pm 16.79$), than in those hospitalized for longer time ($M = 42.98 \pm 16.38$). Similarly, lower results were confirmed in patients after a longer period from the end of hospitalization (after 6 month; $M = 31.80 \pm 17.66$) than after 3 months ($M = 37.14 \pm 16.58$). Finally, significantly higher PTSD results ($p < 0.02$) were noted in cases of severe course of the disease (the need for treatment under an oxygen respirator, longer hospitalization time; $M = 37.04 \pm 17.76$), compared to those with lighter course ($M = 32.18 \pm 16.53$). There were no statistically significant differences depending on the absence or coexistence of other chronic diseases.

The highest intensity of symptoms was observed in negative alterations in cognitions and mood ($M = 2.79$)[1] and alterations in arousal and reactivity ($M = 2.70$); these were significantly different (< 0.001) from avoidance ($M = 0.91$). Since some kurtosis values are slightly below – 1, these distributions are slightly platykurtic.

The mean result of the studied group is high and exceeds the established cut-off point (≥ 33), which indicates the probability of a PTSD diagnosis [24]. Based on this value, 55.6% of the respondents in the present study can be qualified as demonstrating probable PTSD. Most of these patients were hospitalized for more than two weeks, with a severe course of the disease and examined within a shorter period after discharge from the hospital.

Table 2 shows the mean results of the examined psychological variables, first for the entire study group, and in the following columns – a comparison of the results for the subgroups differentiated in terms of the risk of PTSD.

---

[1] The results take into account different numbers of items in individual symptoms, i.e.,: B – 5, C – 2, D – 7, E – 6.

Table 2. **Results of the examined psychological variables**

Examined variables	In total (N = 250)		Risk of PTSD					
			Low (N = 111)		High (N = 139)			
	M	SD	M	SD	M	SD	t	p
Perceived stress	21.53	8.96	15.23	7.59	26.55	6.44	-12.75	0.001
Intrusive ruminations	15.00	8.27	9.01	6.16	19.78	6.42	-13.42	0.001
Deliberate ruminations	15.75	7.43	12.63	7.42	18.24	6.46	-6.38	0.001
Positive emotions	28.69	10.63	28.91	7.44	27.80	7.26	1.19	ns
Negative emotions	23.32	7.24	19.48	5.59	26.39	6.95	-8.51	0.001
Resilience	28.66	8.06	30.16	7.17	27.46	8.55	2.66	0.01

t – Student's t-test; p – significance level; ns – non significance

In the entire study group, the severity of stress related to one's own life situation over the last month preceding the examination was high (sten score of 7), while the rumination and resilience results correspond to average values (sten scores of 5–6). On the other hand, in assessing the emotional state, positive feelings outweigh negative ones. The comparison of the results of two subgroups, differentiated according to the probable risk of PTSD diagnosis, reveals significant differences in all the examined variables apart from the intensity of positive emotions. Due to the greatest diversity, particular attention should be paid to the severity of perceived stress and intrusive rumination. Resilience, which is the ability of an individual to detach oneself from negative experiences and flexibly adapt to changing life demands, is significantly higher in the low-risk subgroup of PTSD.

Relationships between the studied variables

The next stage of the analysis established the correlations between the psychological variables (Table 3), and then determined PTSD predictors (Table 4).

Table 3. **Correlations between the explanatory variables and PTSD**

	PTSD – total	B. Intrusion	C. Avoidance	D. Changes in cognitions and mood	E. Changes in arousal and reactivity
Perceived stress	0.72***	0.57***	0.52***	0.69***	0.71***
Intrusive ruminations	0.76***	0.74***	0.65***	0.66***	0.66***
Deliberate ruminations	0.49***	0.49***	0.41***	0.39***	0.44***
Positive emotions	0.04	0.05	0.06	0.00	0.06

| Negative emotions | 0.50*** | 0.34** | 0.34** | 0.52*** | 0.52*** |
| Resilience | -0.16* | -0.10 | -0.04 | -0.22** | -0.15 |

Significance level: * <0.05; ** <0.01; *** <0.001

The strongest positive relationships were found between the overall PTSD score and perceived stress and intrusive ruminations. High values of the correlation coefficients also apply to the positive associations of PTSD symptoms with negative emotions and reflective rumination about the disease. Resilience revealed a negative correlation with the severity of PTSD, suggesting its protective effect, although the strength of the relationship is relatively weak. Positive emotions do not correlate with PTSD symptoms.

In order to determine PTSD predictors, a multiple regression model (stepwise regression) was used. The regression model included six psychological variables, i.e.: perceived stress, intrusive and deliberate ruminations, negative and positive emotions, and resilience. In addition, three categorical variables were included concerning the severity of the disease (less vs. more severe), the duration of hospitalization (up to two weeks vs. over two weeks) and the time of performed test (three months vs. six months). Before being introduced to the model, categorical variables were parameterized with sigma-constraints.

The results of multiple regression analysis for predicting PTSD are presented in Table 4. Six variables remained in the final model (see Table 4), with four being statistically significant.

Table 4. **Predictors of PTSD**

	R^2	Beta	B	t	p-level
Constant value			-1.58	-0.71	ns
Intrusive ruminations	0.59	0.49	1.03	10.86	0.001
Perceived stress	0.12	0.36	0.69	7.25	0.001
Negative emotions	0.005	0.11	0.26	2.50	0.01
Time after hospitalization	0.005	-0.07	-1.23	-2.02	0.05
Hospitalization time	0.001	0.05	1.06	1.35	ns
The severity of the disease	0.001	-0.04	-0.72	-1.05	ns
R^2 = 0.72; F(6,235) = 98.99; p <0.001					

R^2 – coefficient of determination; Beta – standardized regression coefficient; B – unstandardized regression coefficient

Overall, the model explains 72% of the total variance. Two psychological variables turned out to be the most significant for predicting the occurrence of post-traumatic stress disorders, i.e., intrusive ruminations, explaining 59% of the variance, and perceived stress, responsible for 12% of the variability. Their Beta values are positive,

which indicates that the severity of PTSD symptoms increases with the appearance of intrusive ruminations and the perceived stress. Two other variables, i.e., negative emotions and time after hospitalization, turned out to be significant, but they explain less than 1% of the variance, and therefore may be omitted in the predictions.

Discussion

The conducted research indicates a high frequency (55.6%) of post-traumatic stress disorder in people hospitalized for Covid-19. Its severity is greater in people whose course of the disease was more severe and therefore hospitalization lasted longer. As time goes on, the symptoms of PTSD decrease in severity.

Intrusive ruminations and – to a lesser extent – perceived stress turned out to be the determinants of the severity of PTSD symptoms. Both variables are related to each other. This is a consequence of the fact that intrusive ruminations increase the sense of distress, especially in relation to perceived helplessness. Moreover, intrusive ruminations are associated with negative emotions experienced by a person. The conducted research indicates the dominant role of cognitive processes in the process of negative consequences of the experienced traumatic event, which was hospitalization due to Covid-19.

Intrusive ruminations contribute to the intensification of post-traumatic stress symptoms manifested in the form of intrusion, which is characterized by the recurrence of the experienced event, increased vigilance, anxiety, impatience, and difficulties in concentration. This association of rumination with PTSD symptoms has been confirmed in various studies of trauma victims [32]. Therefore, it can be assumed that it also applies to experiences related to hospitalization. This may mean that reducing the severity of PTSD requires reducing the tendency to rumor about the experienced situation. It is worth mentioning that deliberate/intentional ruminations play a slightly different role. As a rule, they appear later and are related to the search for ways to deal with the experienced event. This type of rumination is conducive to the occurrence of positive post-traumatic changes, reflected in the form of post-trauma growth [10, 33]. Considering the fact that the occurrence of the consequences of the experienced trauma is a dynamic process spread over time, it can be indicated that both types of rumination play their own, slightly different role. Intrusive ruminations can be treated as a natural reaction to the experienced trauma preceding deliberate ruminations, which in turn facilitate the occurrence of post-traumatic growth.

The relationship between the types of rumination and the consequences of trauma can therefore be used in therapy by increasing the involvement of target rumination. In the process of dealing with trauma, their role is to consciously rebuild the cognitive representations of important aspects of human life.

Limitations

Although cross-sectional studies are valuable for detecting associations, longitudinal studies are needed to identify potential causal relationships between exposure to a traumatic event and the symptoms of PTSD. Previous mental illnesses and other mental health problems (e.g., loneliness, anxiety, depression) related to the pandemic period, which may also be predictors of PTSD, were not included in the conducted studies.

Further research should also take into account the factors that protect against the development of the negative effects of a pandemic and may even favor post-traumatic growth. The psychological consequences of a pandemic are not limited to those associated with hospitalization and PTSD. It should be verified whether the obtained results really reflect PTSD or another stress-related state. Some authors propose to consider a new type of pandemic stress disorder, such as COVID-19 stress syndrome [34].

Final remarks

1. The conducted studies highlight the need for regular monitoring of the mental state of patients, including the presence of PTSD symptoms, before discharge from hospital and monitor changes after discharge.
2. It is recommended to use various forms of help as widely as possible, including various applications, Internet resources and social media, to share strategies for coping with psychological stress during the pandemic period.

References

1. Rogers J, Chesney E, Oliver D, Pollak T, McGuire P, Fusar-Poli P et al. *Psychiatric and neuropsychiatric presentations associated with severe coronavirus infections: A systematic review and meta-analysis with comparison to the COVID-19 pandemic*. Lancet Psychiatry 2020; 7(7): 611–627.

2. Wang B, Yang X, Fu L, Hu Y, Luo D, Xiao X et al. *Post-traumatic stress disorder symptoms in COVID-19 survivors 6 months after hospital discharge: An application of the conservation of resource theory*. Front. Psychiatry 2022; 12: 773106. Doi: 10.3389/fpsyt.2021.773106.

3. Xiong J, Lipsitz O, Nasri F, Lui L, Gill H, Phan L et al. *Impact of COVID-19 pandemic on mental health in the general population: A systematic review*. J. Affect. Disord. 2020; 277: 55–64.

4. Mukaetova-Ladinska E, Kronenberg G. *Psychological and neuropsychiatric implications of COVID-19*. Eur. Arch. Psychiatry Clin. Neurosci. 2021; 271(2): 235–248.

5. Schou T, Joca S, Wegener G, Bay-Richter C. *Psychiatric and neuropsychiatric sequelae of COVID-19 – A systematic review*. Brain Behav. Immun. 2021; 97: 328–348.

6. Janiri D, Carfì A, Kotzalidi G, Bernabei R, Landi F, Sani G. *Posttraumatic stress disorder in patients after severe COVID-19 infection*. JAMA Psychiatry 2021; 78(5): 567–569.

7. Purssell E, Gould D, Chudleigh J. *Impact of isolation on hospitalised patients who are infectious: Systematic review with meta-analysis*. BMJ Open 2020; 10(2): e030371. Doi: 10.1136/bmjopen-2019-030371.

8. Vlake J, Wesselius S, Genderen van M, Bommel van J, Boxma-de Klerk B, Wils E. *Psychological distress and health-related quality of life in patients after hospitalization during the COVID-19 pandemic: A single-center, observational study*. PLoS ONE 2021; 16(8): e0255774. Doi.org/ 10.1371/journal.pone.0255774.

9. Liu N, Zhang F, Wei C, Jia Y, Shang Z, Sun L et al. *Prevalence and predictors of PTSS during COVID-19 outbreak in China hardest-hit areas: Gender differences matter*. Psychiatry Res. 2020; 287: 112921. Doi: 10.1016/j.psychres.2020.112921.

10. Ogińska-Bulik N. *Dwa oblicza traumy*. Warsaw: Difin; 2015.

11. Foa E, Rothbaum B. *Treating the trauma of rape: Cognitive-behavioral therapy for PTSD*. New York: Guilford Press; 1998.

12. Horowitz M. *Stress response syndrome*, 2nd ed. New York: Jason Aronson; 1986.

13. Nolen-Hoeksema S. *The role of rumination in depressive disorders and mixed depressive / anxiety symptoms*. J. Abnorm. Psychol. 2000; 109(3): 504–511.

14. Ehlers A, Clark D. *A cognitive model of posttraumatic stress disorder*. Behav. Res. Ther. 2000; 38(4): 319–345.

15. Ehring T, Ehlers A. *Does rumination mediate the relationship between emotion regulation ability and posttraumatic stress disorder?* Eur. J. Psychotraumatol. 2014; 5. Doi:10.3402/ ejpt.v5.23547.

16. Cann A, Calhoun L, Tedeschi R, Triplett K, Vishnevsky T, Lindstrom C. *Assessing posttraumatic cognitive processes: The event related rumination inventory*. Anxiety Stress Coping 2011; 24(2): 137–156. http://dx.doi.org/10.1080/10615806.2010.529901"10.1080/1061580 6.2010.529901.

17. Juczyński Z, Ogińska-Bulik N. *Ruminations and occupational stress as predictors of posttraumatic stress disorder and burnout among police officers*. Int. J. Occup. Saf. Ergon. 2022; 28(2): 743–750. https://doi: 10.1080/10803548.2021.1907986.

18. Block J, Kremen A. *IQ and ego-resiliency: Conceptual and empirical connections and separateness*. J. Pers. Soc. Psychol. 1996; 70(2): 349–361.

19. Ogińska-Bulik N, Juczyński Z. *Prężność jako wyznacznik pozytywnych i negatywnych konsekwencji doświadczonej sytuacji traumatycznej*. Pol. Forum Psychol. 2012; 17(2): 395–410.

20. Connor K. *Assessment of resilience in the aftermath trauma*. J. Clin. Psychiatry 2006; 67(2): 46–49.

21. Wrenn G, Wingo A, Moore R, Pelletier T, Gutman A, Bradley B et al. *The effect of resilience on posttraumatic stress disorder in trauma-exposed inner-city primary care patients*. J. Natl. Med. Assoc. 2011; 103(7): 560–566.

22. Horn M, Wathele M, Fovet T, Amad A, Vuotto F, Faure K et al. *Is COVID-19 associated with posttraumatic stress disorder?* J. Clin. Psychiatry 2020; 8: 82(1): 20m13641. Doi: 10.4088/ JCP.20m13641. PMID: 33296149.

23. Ju Y, Liu J, Ng R, Liu B, Wang M, Chen W et al. *Prevalence and predictors of post-traumatic stress disorder in patients with cured coronavirus disease 2019 (COVID-19) one month post-discharge*. Eur. J. Psychotraumatol. 2021; 12(1): 1915576. Doi.org/10.1080/20008198.2021 .1915576.

24. Weathers F., Litz B., Keane T., Palmieri P., Marx B., Schnurr P. *The PTSD Checklist for DSM-5 (PCL-5)*. The National Center for PTSD; 2013. www.ptsd.va.gov.

25. Ogińska-Bulik N, Juczyński Z. *Psychometric properties of the Polish version of the Posttraumatic Stress Disorder Check List according to DSM-5 – PCL-5*. Psychiatr. Pol. 2023; 57(3): 607–619. https://doi.org/10.12740/PP/149460

26. Cohen, S., Kamarck, T., Mermelstein, R. *A global measure of perceived stress*. J. Health Soc. Behav 1983; 24: 385–396.27.

27. Juczyński Z, Ogińska-Bulik N. *Narzędzia pomiaru stresu i radzenia sobie ze stresem*. Warsaw: Psychological Test Laboratory; 2009.

28. Cann A., Calhoun L.G., Tedeschi R.G., Triplett K.N., Vishnevsky T., Lindstrom C.M. (2011). *Assessing posttraumatic cognitive processes: the Event Related Rumination Inventory*. Anxiety, Stress & Coping, 24(2), 137–156.

29. Ogińska-Bulik N, Juczyński Z. *Inwentarz Ruminacji o Negatywnym Zdarzeniu – polska adaptacja*. Przegląd Psychologiczny 2015; 58(3): 383–400. http://www.kul.pl/files/714/3.58.2015_art.7.pdf

30. Brzozowski P, Watson D, Clark L. *Skala uczuć pozytywnych i negatywnych SUPIN*. Warsaw: Psychological Test Laboratory; 2010.

31. Ogińska-Bulik N, Juczyński Z. *Skala pomiaru prężności (SPP-25)*. Nowiny Psychol. 2008; 3: 39–56.

32. Michael T, Halligan S, Clark D, Ehlers A. *Rumination in posttraumatic stress disorder*. Depress. Anxiety 2007; 24(5): 307–317.

33. Watkins E. *Adaptive and maladaptive ruminative self-focus during emotional processing*. Behav. Res. Ther. 2004; 42(9): 1037–1052.

34. Taylor S. *COVID Stress syndrome: Clinical and nosological considerations*. Curr. Psychiatr. Rep. 2021; 23(4): 19. Doi: 10.1007/ s11920-021-01226-y 90.

Address: Zygfryd Juczyński
WSB Merito University in Lodz
e-mail: zygfryd.juczynski@lodz.merito.pl