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Szymon Florek[1], Kamila Meca[2], Łukasz Czogalik[2], Magdalena Justyna Piegza[3], Paweł Gustaw Dębski[3], Piotr Gorczyca[3], Robert Pudlo[1]

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The role of ego-resilience in a group of Polish men during the COVID-19 pandemic

Rola prężności psychicznej w grupie polskich mężczyzn w czasie pandemii COVID-19

[1]Department of Psychoprophylaxis in Tarnowskie Gory, Faculty of Medical Sciences in Zabrze, Medical University of Silesia in Katowice, Katowice, Poland
[2]Student Research Group, Department of Psychiatry, Faculty of Medical Sciences in Zabrze, Medical University of Silesia in Katowice, Katowice, Poland
[3]Department of Psychiatry, Faculty of Medical Sciences in Zabrze, Medical University of Silesia in Katowice, Katowice, Poland
Correspondence: Szymon Florek, Department of Psychoprophylaxis in Tarnowskie Gory, Medical University of Silesia in Katowice, Faculty of Medical Sciences in Zabrze, Pyskowicka 49, 42-600 Tarnowskie Góry, e-mail: szymon.florek@sum.edu.pl

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ORCID iDs
1. Szymon Florek https://orcid.org/0000-0001-7526-1430
2. Kamila Meca https://orcid.org/0000-0002-9737-9971
3. Łukasz Czogalik https://orcid.org/0000-0003-3886-9708
4. Magdalena Justyna Piegza https://orcid.org/0000-0002-8009-7118
5. Paweł Gustaw Dębski https://orcid.org/0000-0001-5904-6407
6. Piotr Gorczyca https://orcid.org/0000-0002-9419-7988
7. Robert Pudlo https://orcid.org/0000-0002-5748-0063

Abstract

Introduction and objective: The COVID-19 pandemic has had a significant impact on peoples' mental health. The literature is abundant with studies describing levels of aggression, anxiety, and alcohol consumption during 2020–2021. However, it is noteworthy that little attention has been paid to the responses of men to the pandemic. The aim of this study was to assess adaptive abilities in response to the COVID-19 pandemic among a group of Polish men. Particular focus was placed on the role of ego-resiliency. **Materials and methods:** The study utilised an online survey conducted in two periods: 24 April to 8 May 2020 and 5 February to 6 March 2022. Participants included 125 men aged 18–66 in the first period and 136 men aged 18–57 in the second period. The survey included the Generalized Anxiety Disorder-7 Scale, Alcohol Use Disorders Identification Test, Buss–Perry Aggression Questionnaire, and Ego-Resiliency Scale. **Results:** In the second phase of the study, anxiety showed a stronger negative correlation with ego-resiliency. Ego-resiliency was also correlated with hostility and generalised aggression. However, correlations between verbal aggression and resilience were weaker in the second period. Resilience showed comparable correlations with alcohol consumption, physical aggression, and anger in both periods. **Conclusions:** Ego-resiliency emerged as a protective factor against anxiety, anger, and hostility during the COVID-19 pandemic among the studied groups of men. It appears to be a stable and integral part of personality, unaffected by the pandemic period. The role of mental resilience in relation to verbal aggression remains unclear.

Keywords: ego-resiliency, COVID-19, mental health

Streszczenie

Wprowadzenie i cel: Pandemia COVID-19 wywarła istotny wpływ na zdrowie psychiczne wielu osób. W piśmiennictwie nie brakuje badań opisujących natężenia agresji, lęku czy spożycia alkoholu w latach 2020–2021. Zwraca jednak uwagę to, że stosunkowo niewielką uwagę poświęca się reakcji mężczyzn na pandemię. Celem pracy była ocena zdolności adaptacyjnych w odpowiedzi na pandemię COVID-19 w grupie polskich mężczyzn. Szczególnie pochylono się nad rolą prężności psychicznej (*ego-resiliency*). **Materiał i metody:** Badanie zostało przeprowadzone za pomocą ankiety online w dwóch terminach – od 24 kwietnia do 8 maja 2020 roku i od 5 lutego do 6 marca 2022 roku. Respondenci należeli do dwóch grup składających się ze 125 mężczyzn w wieku 18–66 lat w pierwszym terminie oraz 136 mężczyzn w wieku 18–57 lat w drugim terminie. W formularzu wykorzystano Kwestionariusz Lęku Uogólnionego GAD-7 (Generalized Anxiety Disorder-7 Scale), Test Rozpoznawania Problemów Alkoholowych (Alcohol Use Disorders Identification Test), Kwestionariusz Agresji Bussa–Perry'ego (Buss–Perry Aggression Questionnaire) i Skalę Sprężystości Psychicznej (Ego-Resiliency Scale). **Wyniki:** W analizie statystycznej można zauważyć silniejszą ujemną korelację lęku z prężnością psychiczną (oraz jej składową – optymalną regulacją) w drugim terminie badania. Prężność i jej składowe podobnie korelują z wrogością oraz agresją uogólnioną. Ponadto w drugim terminie badania korelacje między agresją słowną a prężnością były słabsze niż w pierwszym terminie. Korelacje prężności ze spożyciem alkoholu, agresją fizyczną oraz gniewem są porównywalne w obydwóch terminach. **Wnioski:** Prężność psychiczna okazała się czynnikiem ochronnym przed

lękiem, jak również gniewem i wrogością w badanych grupach mężczyzn w czasie pandemii COVID-19. Jest ona stałą i integralną częścią osobowości, więc okres pandemii nie wpłynął na jej ogólny poziom. Uwagę zwraca nieoczywista rola prężności psychicznej w kontekście agresji słownej.

Słowa kluczowe: Autism Spectrum Quotient – wersja dla dzieci, AQ-Child, AQ-Child – polska wersja językowa

INTRODUCTION

COVID-19 is an infectious disease that presents with symptoms such as shortness of breath, high body temperature, rapid fatigue, and, last but not least, decreased venous blood saturation. Nonetheless, these are only some of the individual symptoms that the SARS-CoV-2 virus can cause, as the full spectrum is significantly broader – including neurological, cardiac, or gastroenterological manifestations (Çalıca Utku et al., 2020; Chen et al., 2021; Jahrami et al., 2022; Villapol, 2020). The psychiatric symptoms associated with COVID-19 are notably more challenging to identify, partly due to potential delays in their onset relative to the infection itself, as well as their persistent nature. One of the most prominent symptoms in this regard is sleep disturbance.

So far, many studies have been conducted on the intensity of aggression, anxiety, or alcohol consumption across various societies (Morrison and Heimberg, 2013; Woods and Ashley, 2007). Similar research was also conducted during the COVID-19 pandemic, and especially during its initial period – from 2020 to 2021. However, there is a lack of data in the literature regarding the subsequent period, which seems particularly relevant in the context of studies indicating an increase in aggression, anxiety, or alcohol consumption related to the pandemic (Field, 2021; Pashazadeh Kan et al., 2021; Ramalho, 2020).

Mental resilience (ego-resiliency, ER), on the other hand, is definitely a new topic. The first questionnaire measuring it was created by Block and Kremen in 1996 (Block and Kremen, 1996), and since then, the scale has been continuously refined and adapted to the cultural contexts of many different countries – including Poland (Kołodziej-Zaleska and Przybyła-Basista, 2018). The concept of mental resilience is still debated among many researchers today. Mental resilience is sometimes referred to as resilience and sometimes as resiliency. Thus, it may describe a process of flexible coping with crises "here and now", or be conceptualised as a relatively stable personality trait related to a general disposition for effectively dealing with crisis situations (Dębski et al., 2021). The latter concept is closest to Block's considerations. Block's concept of psychological resilience is related to the constructs of ego-control and ER, which play a key role in the formation of personality understood as an affective processing system. Ego-control refers to a person's control of impulses – their inhibition or expression in various situations, while ER involves adjusting the level of this control depending on environmental conditions and actual needs. The interplay between these two mechanisms ensures flexible behaviour, which contributes to a person's adaptation to changing circumstances (Farkas and Orosz, 2015).

As mentioned above, there is a considerable body of literature on various societies or specific social groups and their reactions to the COVID-19 pandemic. Individual studies also provide data on women's responses to the pandemic, with a particular focus on pregnant women (Izydorczyk et al., 2018; Sun et al., 2021). However, in the scientific world, relatively little attention has been given to men and their reactions to the pandemic period, which certainly has also left its mark on this demographic. This issue was highlighted in a review of the literature analysing 27 studies on men's mental health during the COVID-19 pandemic. However, as the authors point out – more research is needed to define the impact of COVID-19 on different levels of men's functioning in society (Park et al., 2022).

In the available literature on pandemics, gender has been included as a variable and the psychological characteristics of men are usually compared with those of women. Various dimensions of behaviour and psychological responses during a pandemic have so far been analysed through a gender lens. For example, Fenollar-Cortés et al. (2021) found significant gender differences in the psychological impact of the pandemic, and Cholankeril et al. (2023) reported differences in anxiety coping strategies between men and women. Moreover, other studies indicating gender differences show that women are more vulnerable to external factors that may affect their mental state. This is the case for both minor stressors and major ones – such as the COVID-19 pandemic (Laufer and Shechory Bitton, 2021; Lowe et al., 2021). For this reason, it becomes particularly relevant to analyse the impact of the pandemic on men's mental health.

The aim of this study was to assess adaptive capacity in relation to the COVID-19 pandemic in a group of Polish men, with a particular focus on the role of psychological resilience. The study was conducted on two separate groups of men. The first was recruited between 24 April and 8 May 2020. Importantly, according to official data from the Ministry of Health, 322 individuals out of 4,855 newly infected with SARS-CoV-2 died from COVID-19 during this period. During the second study, i.e. from 5 February to 6 March 2022, 6,229 individuals out of 650,709 newly infected died from COVID-19. It is worth noting that by the time the second study was conducted, the pandemic had already lasted more than two years and most lockdown restrictions had been lifted.

MATERIALS

The first part of the study involved 125 individuals (aged 18–66), while the second part included 136 participants (aged 18–57). The socio-demographic characteristics of the study groups are presented in Tab. 1.

The survey was conducted entirely online. The format of the first survey was dictated by the legal restrictions imposed, while the second part of the project, due to the desire to maintain credibility, was conducted the same way. The Bioethics Committee of the Medical University of Silesia, in response to a question posed, expressed the opinion that the implementation of the project did not require its approval. Inclusion criteria for the study were being above 18 years of age and providing informed consent to participate in the project, which involved accepting the study information presented on the first page of the questionnaire. Exclusion criteria included receiving psychiatric treatment within the past year and experiencing significant life changes, such as the death of a close relative, marriage, or divorce. The questionnaire was designed prior to the actual study to ensure all these criteria were properly addressed.

METHODS

The reliability of each test in both phases was assessed using Cronbach's α index, with the first phase denoted as α_1 and the second as α_2. The project used the Generalized Anxiety Disorder-7 (GAD-7) scale to measure the severity of anxiety. The scale consists of 7 questions answered by respondents on a 4-point scale, with the total score being the sum of the points ($\alpha_1 = 0.874$, $\alpha_2 = 0.914$), ranging from a minimum score of 0 to a maximum score of 21 (Spitzer et al., 2006). The Alcohol Use Disorders Identification Test was used to assess alcohol consumption patterns. It is a commonly used scale containing 10 questions with 4- and 3-point answers, and the total score is also obtained by summing the points ($\alpha_1 = 0.815$, $\alpha_2 = 0.796$). The scale can result in a minimum score of 0 and a maximum score of 40 (Saunders et al., 1993). The Buss–Perry Aggression Questionnaire, consisting of 29 items rated on a 5-point scale, was used to assess the severity of aggression and its components. Scores are obtained by summing the points, but reverse scoring applies to some of the items. By summing a certain portion of the points, scores can be obtained for each of the subscales, namely anger (A), hostility (H), verbal aggression (VA), and physical aggression (PA), and by sub-totalling all the answers, the intensity of generalised aggression can be determined ($\alpha_1 = 0.863$, $\alpha_2 = 0.885$). The total score on this scale ranges from a minimum score of 29 to a maximum score of 145 (Buss and Perry, 1992; Siekierka, 2005). The Polish interpretation of the Ego-Resiliency Scale (ER-89) was used to examine ER and its two components: optimal regulation (OR) and openness to life experiences (OL). The questionnaire consists of 12 questions, which are answered by the respondent on a 4-point scale, with total scores obtained by calculating a simple sum of scores ($\alpha_1 = 0.809$, $\alpha_2 = 0.842$). The total score on this scale ranges from a minimum score of 12 to a maximum score of 48 (Kołodziej-Zaleska and Przybyła-Basista, 2018). The results were analysed statistically using Excel 365 and Statistica 13.3.

RESULTS

Given the size of the samples obtained, the data was tested using the Kolmogorov–Smirnov test, along with an assessment of the scatter shown in the graph, to determine the normality of the distribution (Bedyńska and Książek, 2012). A normal distribution was obtained for all variables, which allowed further analysis using parametric tests.

Tab. 2 presents the results for anxiety, alcohol consumption, aggression, and psychological resilience, comparing them between the two study groups. No statistically significant

	First study		Second study		χ^2	*p*
	Number of participants	%	Number of participants	%		
Total number of participants	125	100	136	100		
Place of residence:						
• rural area	20	16.00	23	16.91	0.745	0.863
• town with up to 50,000 inhabitants	20	16.00	18	13.24		
• town with 50,000 to 200,000 inhabitants	34	27.20	34	25.00		
• town with over 200,000 inhabitants	51	40.80	61	44.85		
Education:						
• primary	3	2.40	2	1.47	5.651	0.342
• vocational	1	0.80	1	0.74		
• secondary	53	42.40	59	43.38		
• higher	65	52.00	74	54.41		
• no response	3	2.40	0	0.00		
Healthcare worker						
• yes	12	9.60	28	20.59	6.060	**0.014**
• no	113	90.40	108	79.41		
Bold indicates statistically significant results.						

Tab. 1. Socio-demographic structure of the participants of the first and second surveys

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	First study			Second study			*t*	*p*
	Mean	***SD***	***M***	**Mean**	***SD***	***M***		
Anxiety	5.552	5.131	4.000	6.456	5.236	5.000	−1.407	0.161
Alcohol consumption	5.640	5.119	5.000	5.537	4.947	4.000	0.166	0.869
PA	17.776	5.594	17.000	17.757	5.240	17.000	0.028	0.977
VA	14.832	3.587	15.000	14.625	3.773	14.000	0.453	0.651
A	16.488	5.844	16.000	17.169	5.890	17.000	−0.937	0.350
H	20.032	6.244	20.000	21.140	6.978	20.000	−1.347	0.179
Generalised aggression	69.128	15.506	67.000	70.691	16.519	70.500	−0.786	0.432
ER	35.904	6.106	36.000	35.581	6.512	36.000	0.413	0.680
OL	12.560	4.743	13.000	12.647	2.563	13.000	−0.265	0.791
OR	23.344	4.275	23.000	22.934	4.848	23.000	0.722	0.471

A – anger; **ER** – ego-resiliency; **H** – hostility; ***M*** – median; **OL** – openness to new experiences; **OR** – optimal regulation; **PA** – physical aggression; ***SD*** – standard deviation; **VA** – verbal aggression.

Tab. 2. Comparison of aggression, anxiety, alcohol consumption, and ER between study groups

	Anxiety	Alcohol consumption	PA	VA	A	H	Generalised aggression
ER	−0.111	0.008	0.076	**0.244**	**−0.208**	**−0.355**	−0.144
OL	0.039	0.025	0.133	0.114	−0.032	−0.149	−0.006
OR	−0.183	−0.004	0.023	**0.274**	**−0.276**	**−0.410**	**−0.202**

A – anger; **ER** – ego-resiliency; **H** – hostility; **OL** – openness to new experiences; **OR** – optimal regulation; **PA** – physical aggression; **VA** – verbal aggression.
Bold indicates statistically significant results.

Tab. 3. Correlations between the variables in the first phase of the study ($p < 0.05$)

	Anxiety	Alcohol consumption	PA	VA	A	H	Generalised aggression
ER	**−0.295**	0.099	−0.073	**0.207**	**−0.218**	**−0.461**	**−0.246**
OL	−0.181	0.048	0.014	0.155	−0.033	**−0.264**	−0.088
OR	**−0.296**	0.106	−0.104	**0.194**	**−0.270**	**−0.473**	**−0.279**

A – anger; **ER** – ego-resiliency; **H** – hostility; **OL** – openness to new experiences; **OR** – optimal regulation; **PA** – physical aggression; **VA** – verbal aggression.
Bold indicates statistically significant results.

Tab. 4. Correlations between the variables in the second phase of the study ($p < 0.05$)

Variable	b	b *SE*	β	β *SE*	*t*	*p*	Model properties
VA:							Adjusted $R^2 = 0.078$.
• constant	9.092	1.716	–	–	5.297	<0.001	$F(1,123) = 11.555$
• OR	0.246	0.072	0.293	0.086	3.399	<0.001	$p < 0.001$. *SEE* = 3.444
A:							Adjusted $R^2 = 0.050$.
• constant	24.131	2.840	–	–	8.497	<0.001	$F(1,123) = 7.485$
• OR	−0.327	0.120	−0.240	0.088	−2.736	<0.001	$p < 0.01$. *SEE* = 5.697
H:							Adjusted $R^2 = 0.147$.
• constant	33.406	2.874	–	–	11.622	<0.001	$F(1,123) = 22.371$
• OR	−0.573	0.121	−0.392	0.083	−4.730	<0.001	$p < 0.001$. *SEE* = 5.767

A – anger; **H** – hostility; **OR** – optimal regulation; ***SE*** – standard error; ***SEE*** – standard error of estimation; **VA** – verbal aggression.

Tab. 5. Linear regressions of VA, A, and H in light of OR in the first phase of the study

differences were found for these variables. The results suggest statistically non-significant higher levels of anxiety and psychological resilience at the second examination date, and lower expressions of the other traits. However, these results should not be analysed further due to lack of statistical significance.

Pearson's correlation coefficients were then determined for the variables studied, with the results shown in Tab. 3 and 4. As observed, the negative correlations between anxiety and ER, specifically its component OR, are stronger among men participating in the second phase of the study. Correlations between ER and its components with H and generalised aggression follow a similar pattern. In the second phase of the study, the correlations between VA and ER and its components were weaker compared to the first phase. Interestingly, the correlations between ER and its components with alcohol consumption, physical aggression PA, and anger A are comparable in both terms.

Based on the correlations obtained, a regression analysis was conducted for the dependent variables where statistically significant correlations were present. Due to the analysis of each aggression component and ER, regression analyses

Variable	b	b *SE*	β	β *SE*	*t*	*p*	Model properties
Anxiety:							Adjusted $R^2 = 0.085$.
• constant	13.966	2.084	–	–	6.701	<0.001	$F(1,134) = 13.562$
• OR	−0.327	0.089	−0.303	0.082	−3.683	<0.001	$p < 0.001$. *SEE* = 5.009
VA:							Adjusted $R^2 = 0.032$.
• constant	11.085	1.545	–	–	7.177	<0.001	$F(1,134) = 5.485$
• OR	0.154	0.066	0.198	0.085	2.342	<0.05	$p < 0.05$. *SEE* = 3.712
A:							Adjusted $R^2 = 0.099$.
• constant	26.216	2.327	–	–	11.268	<0.001	$F(1,134) = 15.791$
• OR	−0.394	0.099	−0.325	0.082	−3.974	<0.001	$p < 0.01$. *SEE* = 5.591
H:							Adjusted $R^2 = 0.233$.
• constant	37.266	2.543	–	–	14.656	<0.001	$F(1,134) = 42.007$
• OR	−0.703	0.108	−0.489	0.075	−6.481	<0.001	$p < 0.001$. *SEE* = 6.111

A – anger; **H** – hostility; **OR** – optimal regulation; ***SE*** – standard error; ***SEE*** – standard error of estimation; **VA** – verbal aggression.

Tab. 6. Linear regressions of anxiety, VA, A, and H in light of OR in the second phase of the study

	Secondary education			Higher education			*t*	*p*
	Mean	*SD*	*M*	Mean	*SD*	*M*		
First study:								
• ER	35.075	6.391	35.000	36.923	5.535	37.000	−1.682	0.095
• OL	12.415	2.649	13.000	12.892	2.762	14.000	−0.951	0.344
• OR	22.660	4.645	22.000	24.031	3.657	24.000	−1.793	0.076
Second study:								
• ER	35.102	6.400	36.000	35.838	6.707	36.500	0.642	0.522
• OL	12.610	2.600	13.000	12.662	2.566	13.000	0.115	0.908
• OR	22.492	4.879	23.000	23.176	4.900	23.000	0.801	0.424

ER – ego-resiliency; ***M*** – median; **OL** – openness to new experiences; **OR** – optimal regulation; ***SD*** – standard deviation.

Tab. 7. Comparison of ER, OR, and OL between level of education in the first and second studies

for generalised aggression in relation to ER were omitted. Furthermore, due to the limited significance of correlations with OL, all regression analyses were conducted in relation to OR. The results of these analyses are presented in Tab. 5 and 6. Regression models with OR as the explanatory variable and the components of aggression as the explained variables were established by assuming that psychological resilience functions as a meta-trait of personality, while aggressive tendencies may represent traits of a more superficial nature, closer to behavioural dispositions. To verify the potential influence of education level on the regression outcomes, a comparison was made between the obtained results of resilience and its components in relation to education at the first and second testing points, as presented in Tab. 7.

All the models presented above are statistically significant, and those involving the second study on A and H explain the influence of OR more effectively than those from the first phase. Moreover, OR has a stronger effect on A and H in the second study than in the first. OR has a weaker modulation on VA among participants in the second phase compared to those in the first phase. Interestingly, only in the second study does OR show a negative association with anxiety.

DISCUSSION

As there were no statistically significant differences in the variables examined between the male groups (Tab. 2), the following discussion focuses on the relationship between psychological resilience and other parameters. The results obtained in the study suggest that psychological resilience, both at the beginning and after two years of the pandemic, had a protective function against anger and hostility in a group of Polish men. It should be noted that these findings are consistent with the original conception of the role of ER developed by Block, as well as with other studies examining the relationship between resilience and aggression (Block and Kremen, 1996; Sadeghifard et al., 2020; Zhang et al., 2021). The latter relationship, between resilience and aggression, can be seen in the correlations of generalised aggression with OR, and of both ER and OR in the second study. Nevertheless, the purpose of the present study was to analyse the effect of resilience on the individual components of aggression, as highlighted in the regression analyses. In these, the focus was on the effect of OR on the individual components of aggression because, according to the correlation analysis, it is the part of ER that is significantly more strongly related to aggression and its components. The individual weak negative correlation between OL and H was considered coincidental and was not further analysed. It is worth noting that in the second phase of the study, significantly stronger regressions were obtained for A and H compared to the first phase, while the positive influence of OR on VA was weaker. So far, no similar studies have been conducted to determine the relationship between ER and aggression at different time points. Considering the limitations of the study presented below, the results of this project should be interpreted with caution.

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Given the fact that the comparative analysis did not reveal statistically significant differences in ER and its components between the first and second studies, it may be assumed that the mental resilience of Polish men was modified qualitatively but not quantitatively during the COVID-19 pandemic. This assumption sheds a different light on the concept of mental resilience than before. At this point, it is important to emphasise the close and long-established relationship between irritation and aggression. As it turns out, irritation can elicit a response mainly in terms of hostility and anger (Berkowitz, 1989). Relating that data to the results of the present study, it is important to note that during the COVID-19 pandemic, a significant portion of the population primarily experienced irritation related to the restrictions imposed.

In the context of the COVID-19 pandemic, it is impossible to ignore the trauma associated with potential illness and daily media reports. Moreover, according to Heitzman (2020), exposure to these events may have led to a prolonged acute stress response. For this reason, an analysis of ER in light of traumatic experiences is warranted. As the authors of the literature review state, it is clear that trauma affects the organisation of personality structure (Agaibi and Wilson, 2005). Applying this claim to the results of the present study, it is worth emphasising once again the change in the organisation of OR, which is an integral part of ER in terms of protective properties.

In the second phase of the study, OR also significantly influenced feelings of anxiety, which was not evident in the first study. This may be a result of having to deal with more difficult problems than in the earlier period. As a survey conducted on nursing staff has shown, mental resilience helps in effective problem solving. On the other hand, the link between stress and anxiety has been known for years (Robinson, 1990). Undoubtedly, responders during the COVID-19 pandemic were exposed to considerable stress, which may have implied the need to strengthen or develop new ways of coping with stress, in which ER can also be helpful (Ziarko et al., 2019).

Reference should also be made to the adaptation process. As shown in the previously cited literature review, psychological resilience plays a very important role in this stage (Ziarko et al., 2019). Moreover, another study highlights the key role of ER in maintaining psychological well-being in post-divorce individuals (Kołodziej-Zaleska and Przybyła-Basista, 2020). In the context of these findings, it is important to consider the previously mentioned chronic nature of the pandemic as a form of trauma, which may have required strengthening adaptive capacities even during the ongoing traumatic event, in which ER undoubtedly played a role (Heitzman, 2020). In this light, it becomes evident that in the second phase of the study, ER must have modulated the intensity of anxiety, serving as a catalyst for the process of adaptation.

Given the data indicated above, the positive effect of OR on VA remains unclear. Certainly, this is a novel finding that requires verification in future studies. Nevertheless, it seems that it may reflect the above-mentioned irritation caused by pandemic limitations. Indeed, it is worth noting that irritation directly translates into hostility and anger, which ER negatively modulates by promoting a more optimal expression of emotion in the form of verbal aggression. In the second phase of the study, however, there may have been a situation in which ER modulated A and H more strongly, but due to the duration of the annoyance factor, it had already become somewhat indifferent, allowing less expression of VA and thus less promotion of it by OR.

The present study has some limitations, the most important being that it was conducted on two completely separate groups of men. For this reason, the analyses presented are primarily cognitive, which does not change the fact that, given the lack of similar studies in the existing literature, they are valuable. Another significant limitation is the survey format – it was conducted twice exclusively via the Internet, which made it impossible to interact with respondents and answer potential concerns. In the first phase of the study, this approach was dictated by legal restrictions, while in the second phase, the same format was maintained to enable comparison between the two groups. Another limitation is the nature of the study sample, which is not representative of the Polish population. There is an underreported age structure in the study groups. To obtain as many responses as possible, the survey was conducted with the option to select only the age range, and providing the exact age was voluntary. This meant that the variable of respondents' age could not be included in the statistical analyses. As highlighted in Tab. 1, the study groups were statistically significantly different in terms of the number of health professionals. Taking into account other socio-demographic variables, this statistically significant difference does not appear to significantly affect the analyses presented in the article. This situation is likely to be the result of health professionals completing the questionnaire in greater numbers by chance, as both study phases used the same means of communication to disseminate the survey. Perhaps this is indicative of an increased interest in the COVID-19 pandemic by health professionals as a result of their interaction with sick patients; however, this analysis is well beyond the scope of this article. Finally, it is important to consider the possible influence of socio-demographic factors on the linear regressions studied. While in terms of age, the work is limited by the issue described above, to exclude the influence of education level, relevant comparisons were made in Tab. 7. The absence of statistically significant differences in this respect suggests that education level has no influence on the intensity of psychological resilience and its components, and thus should also have no influence on the linear regression analyses presented in the paper.

The presented survey also has its advantages. Undoubtedly, respondents felt comfortable answering questions – often sensitive ones, such as the amount of alcohol consumed – at their convenience. Additionally, it is important to highlight

the substantial number of participants involved in the study, which surpasses the feasibility of conducting a similar study in a traditional offline format.

CONCLUSIONS

The COVID-19 pandemic period did not affect the overall level of mental resilience and its components, confirming that resilience is a stable and integral part of personality. During the pandemic, mental resilience among the male subjects proved to be a protective factor against anxiety, as well as anger and hostility. However, the role of mental resilience in the context of verbal aggression is not yet entirely clear and requires further research.

Conflict of interest

The authors do not report any financial or personal connections with other persons or organisations which might negatively affect the content of this publication and/or claim authorship rights to this publication.

Author contribution

Original concept of study; collection, recording and/or compilation of data: SF, MJP, PGD. Analysis and interpretation of data: KM, ŁC, PGD. Writing of manuscript: SF, KM, ŁC. Critical review of manuscript: MJP, PG, RP. Final approval of manuscript: PG, RP.

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